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Prequalification Unit Inspection services
WHO PUBLIC INSPECTION REPORT
(WHOPIR)
Finished Product Manufacturer

Part 1	**General information**
Manufacturers details	
Name of manufacturer	**Dong-A ST Co., Ltd.**
Corporate address of manufacturer	Dong-A ST Co., Ltd. 64, Cheonho-daero, Dongdaemun-gu, Seoul, Republic of Korea
Inspected site	
Name & address of inspected manufacturing site if different from that given above	Dong-A ST Co., Ltd. 2F Section B, 3F, 4F Section B, 200-23. Baekseokgongdan 1-ro, Seobuk-gu, Cheonan-si, Chungcheongnam-do, 31093, Republic of Korea
Inspection details	
Dates of inspection	6-8 September 2023
Type of inspection	Routine GMP Inspection
Introduction	
Brief description of the manufacturing activities	The site is authorized to manufacture oral solid dosage forms (tablets, capsules, powders), lyophilizates, small volume parenterals and cytotoxic/anticancer medicines (solutions, lyophilizates). The manufacturing facilities for oral solid dosage forms are located on the 3rd floor of the building while sterile injectables (solutions, lyophilizates, cytotoxic) are manufactured on the 4th floor. The Clofazimine 100mg soft gel caps were contract manufactured by Suheung and were packaged, tested, and released by Dong-A ST.
General information about the company and site	Dong-A ST belongs to a group of companies. The site in Cheon-an was licensed in January 2000 by MFDS and is located approximately 100Km south of Seoul
History	The site was last inspected by WHO in November 2016. Two desk assessments were carried out in June 2020 and June 2021
Brief report of inspection activities undertaken – Scope and limitations	

Areas inspected	Documents reviewed included but were not limited to: • Quality Manual – management review meetings • Organization Chart • Job descriptions for key personnel • Personnel training and hygiene • Product Quality Review • Quality Risk Management • Responsibilities of the quality and production units • Complaints and Recalls • Deviation handling and CAPA • Change control • OOS and OOT investigations • Material release • Self-inspection and vendor qualification • Validation and qualification • Equipment calibration • Data integrity • Sampling and testing of materials • Batch processing records • Materials management system • Analytical methods – stability • HVAC system • PW system Areas visited: • Starting materials, packaging materials and FPP warehouses • Sampling and dispensing areas • Capsule manufacturing operations • QC laboratories
Restrictions	N/A
Out of scope	Products and manufacturing activities not related to WHO-PQ products were not covered
WHO products covered by the inspection	Cycloserine Capsules, hard 250mg Clofazimine Capsules, soft 100mg

Abbreviations	**Meaning**
AHU	Air handling unit
ALCOA	Attributable, legible, contemporaneous, original and accurate
API	Active pharmaceutical ingredient
APR	Annual product review
APS	Aseptic process simulation
BMR	Batch manufacturing record
BPR	Batch production record
CC	Change control

CFU	Colony-forming unit
CIP	Cleaning in place
CoA	Certificate of analysis
CpK	Process capability
DQ	Design qualification
EDI	Electronic deionization
EM	Environmental monitoring
FMEA	Failure modes and effects analysis
FPP	Finished pharmaceutical product
FTA	Fault tree analysis
GMP	Good manufacturing practices
GPT	Growth promotion test
HEPA	High efficiency particulate air
HPLC	High performance liquid chromatography (or high performance liquid chromatography equipment)
HVAC	Heating, ventilation and air conditioning
IQ	Installation qualification
LAF	Laminar air flow
LIMS	Laboratory information management system
MB	Microbiology
MBL	Microbiology laboratory
MF	Master formulae
MFT	Media fill Test
MR	Management review
NC	Non conformity
NRA	National regulatory agency
OQ	Operational qualification
PHA	Process hazard analysis
PLC	Programmable logic controller
PM	Preventive maintenance
PQ	Performance qualification
PQR	Product quality review
PQS	Pharmaceutical quality system
PW	Purified water
QA	Quality assurance
QC	Quality control
QCL	Quality control laboratory
QMS	Quality management system
QRM	Quality risk management
RA	Risk assessment
RCA	Root cause analysis
RO	Reverse osmosis
SIP	Sterilization in place
SMF	Site master file

SOP	Standard operating procedure
URS	User requirements specifications
UV	Ultraviolet-visible spectrophotometer
WFI	Water for injection

Part 2	**Summary of the findings and comments**

1. Pharmaceutical quality system

The Quality Manual included several Quality Policies and defined and described the QMS and general procedures, operations, overall authorities, and responsibilities. The QM also described at a high level, the documentation system. Production and QC were independent of each other. Procedures for the evaluation and release of materials and products were in place.

Management Review Meetings

The GMP Committee meetings were normally held every month according to a written procedure. The senior management of the company were provided with an annual report on GMP topics according to the instructions detailed in an SOP.

Quality Risk Management

A procedure on QRM was established. It applied to all areas of GMP including but not limited to, equipment, processes, changes, and deviations. The tools for conducting risk assessments were defined. FMEA was mostly used, and the basic concepts for applying the tool, were described in the SOP. Risk assessments had to be reviewed in case of significant changes or every five years to ensure their validity. Examples of risk assessment were reviewed.

Product Quality Review

The guidelines for planning, organizing, conducting, reviewing, and approving PQRs were detailed in a written procedure. PQRs were conducted annually with the aim to ensure that the standards applied during manufacturing and the processes remained consistent and delivered products according to the established specifications. A rolling plan was established at the beginning of each year and PQRs had to be completed within 6 months. The company used statistical analysis for critical quality attributes when more than 10 batches were manufactured during the review period. If less than 10 batches were manufactured during the year, data from batches manufactured the previous year were used. Working instructions for the application of Cpk as a statistical tool were available. Minitab was used to calculate Cpk.

The following PQRs were reviewed:

Clofazimine. No batches were manufactured during the review period (Jan-Dec 2022).

Clofazimine .19 batches were manufactured during the review period (Jan-Dec 2021).

Cycloserine No batches were manufactured during the review period (Jan-Dec 2022)

Change Control

Changes were handled according to a written procedure. Any employee could propose a change which was evaluated and approved or rejected by the respective team leader. It was then assessed and classified (major or minor) by the QA and the impacted departments were notified. If approved, the change was

implemented in predefined timelines and implementation was verified by the QA. Extensions could be granted by QA upon justification. Changes were registered and managed in an electronic system and the registry for the period 2020-2023 was reviewed. Examples of change requests and their implementation were discussed in detail.

Deviations

Deviations were handled according to the procedure "Deviation Control". According to the SOP, a deviation was reported from the relevant department to the QA department and the deviation was classified according to criticality and impact (critical, major, or minor). Root cause analysis was performed by the department that identified the deviation and the outcome was reviewed by the QA department before CAPAs were identified and implemented. An electronic registry for deviations was maintained and was reviewed.

Batch Release

There was a procedure in place for performing batch release. The legal responsible pharmacist was assigned the task of releasing batches. BMRs, BPRs, environmental reports and analytical reports were reviewed including any changes and deviations, if applicable. A checklist was used to document the review of the relevant documentation. In the case of Clofazimine soft gel caps manufactured by Suheung and packaged by Dong-A ST, Suheung provided the BMR and analytical report and bulk product release. Testing on the bulk was conducted by Dong-A ST before packaging as well as on the finished product before release. Examples of batch release were reviewed.

Any observations related to this section have been adequately addressed and the implementation of CAPA will be verified at the next inspection.

2. Good manufacturing practices for pharmaceutical products

In general, manufacturing processes were defined in SOPs and systematically reviewed. Qualifications/ validations, calibrations and maintenance were performed according to prepared protocols and followed the relevant established procedures. Required resources were available, including adequate premises, equipment, and utilities as well as qualified and trained personnel.
Examples of Cycloserine BMRs were reviewed and discussed in detail.

Any observations related to this section have been adequately addressed and the implementation of CAPA will be verified at the next inspection.

3. Sanitation and hygiene

Premises and equipment were generally maintained at an acceptable level of cleanliness, and they were appropriately labelled, and records were maintained. Procedures for gowning and hygienic behavior in production areas were available. Gowning for capsule manufacturing areas (Grade D area) was described in the SOP "Oral solids manufacturing site access control regulations" and was reviewed. There was appropriate gowning in all areas for staff and visitors, including pictorials and hand washing and sanitization before entry to production areas.

Any observations related to this section have been adequately addressed and the implementation of CAPA will be verified at the next inspection.

4. Qualification and validation

Appropriate procedures were in place for the qualification of equipment, utilities, and systems, for the validation of processes and for the calibration of measuring equipment and devices. A validation plan was available and appropriate records and reports were maintained.
The qualification of the AHU and HVAC system supplying to the dispensary and adjacent rooms were reviewed
Additionally, the Performance Qualification Report of the Blister packing line was checked including the camera qualification (detection of empty pocket, different size tablet, damage to tablet, defect in color, foreign matter). Limits for rejection were set to 100% for defective blisters.
Moreover, the Operation Qualification and Performance Qualification reports for the camera used in the soft gel capsule inspection machine were reviewed.
The Cleaning validation procedure was discussed in detail. According to the SOP the worst case for cleaning is chosen based on a series of parameters including toxicity and solubility values for the APIs used in production. The implementation of the procedure for the mixing drum was checked.

Any observations related to this section have been adequately addressed and the implementation of CAPA will be verified at the next inspection.

5. Complaints

A procedure for handling complaints was in place. The person in charge of the Customer Satisfaction Team was responsible for receiving complaints. Complaints were transferred to the QA Team, if necessary, for investigation and were registered in the customer Consultation System (VOC). The complaint was investigated, and the impact was assessed. CAPA were identified including the possibility of recall according to criticality. The Customer Satisfaction Team would finally contact the customer/agent that placed the complaint to inform them of the investigations and corrective actions. Quarterly review meetings were held, and reports were generated. Recurrent complaints were identified during investigations and were flagged in complaint reviews. A two-year period was used for the review of recurrent complaints. The report for Q2 2023 was reviewed.

Any observations related to this section have been adequately addressed and the implementation of CAPA will be verified at the next inspection.

6. Product recalls

The company had established a procedure to retrieve defective products from the market. A recall could be initiated based on the decision of the local authorities or the decision of the responsible pharmacist (authorized person for batch release). Recalls were categorized into three Classes (Class I being the most urgent). Class I notification had to be sent out as soon as possible while the recall plan had to be sent to the local authorities within 5 days. In addition, the timeframe for completing a Class I recall was set to 15 days according to national legislation.

Any observations related to this section have been adequately addressed and the implementation of CAPA will be verified at the next inspection.

7. Contract production, analysis, and other activities

The audit report for Suheung (manufacturer of Clofazimine 100mg soft gel cap) was reviewed. Due to COVID-19 restrictions, a desk assessment was conducted. The technical agreement was also made available.

Any observations related to this section have been adequately addressed and the implementation of CAPA will be verified at the next inspection.

8. Self-inspection, quality audits and suppliers' audits and approval

Suppliers of raw materials were qualified according to a written SOP. The Purchasing Strategy Team was responsible for identifying potential new suppliers. A questionnaire was sent to the potential supplier to evaluate their GMP status except for packaging material suppliers. The Quality Management team would evaluate the questionnaire and if the supplier was deemed appropriate an on-site audit would be triggered. Audits of API suppliers were conducted every 3 years and for excipients manufacturers, the audit frequency was 5 years. Auditors were qualified according to established criteria detailed in an SOP. Furthermore, API suppliers were requalified yearly according to a written SOP using a risk assessment tool based on supplier performance.
Examples of quality agreements were presented and discussed.

Any observations related to this section have been adequately addressed and the implementation of CAPA will be verified at the next inspection.

9. Personnel

There was an adequate number of personnel suitably qualified by education and training to perform and supervise the manufacture of FPPs. The Organization Chart of Dong-A ST and Cheonan Campus were reviewed. The Manufacturing Team 1 (44 employees) was responsible for hard capsules manufacturing and the Manufacturing Team 3 (49 employees) was responsible for packaging. The warehouse management was under the responsibility of the General Affairs Team (12 employees), as documented in the Job description for the General Affairs employee. Dispensing was performed by the Manufacturing Team 1 employees. An example of a job description of a Manufacturing Team 1 employee was reviewed. The Quality Control Team 1 was tasked to conduct laboratory analyses and the Quality Assurance Team 1 was responsible for QA activities.
The job descriptions of the Quality Assurance 1 Team Leader, the Quality Control 1 Team Leader, the Responsible Pharmacist, and the Manufacturing 1 Team Leader were reviewed. A list of manufacturing personnel responsible for IPC was presented as well as their qualification records.

Any observations related to this section have been adequately addressed and the implementation of CAPA will be verified at the next inspection.

10. Training

Training was performed according to SOP "Education and Training Control. A training plan was prepared annually by the end of December describing the training activities of each department for the following year. The 2023 training program for Manufacturing Team 1 and its implementation were reviewed. Training topics were described in a training matrix. The evaluation of training was not described but some elements of evaluation were presented.

New employees were initially trained by the QA team. Training included general topics and topics described in a training matrix for new employees. After completion of training, the training result report was filled out. Relevant records were reviewed.

Any observations related to this section have been adequately addressed and the implementation of CAPA will be verified at the next inspection.

11. Personal hygiene

The personal hygiene at the facility was considered appropriate regarding the manufacturing and packaging operations carried out and in line with the GMP guidelines. There was a procedure in place adequately defining the concepts of occupational health and hygiene. Personnel were medically examined before being employed and periodically thereafter. Personnel suffering from illness were required to report to their supervisors and were excluded from working in clean and critical areas.

Any observations related to this section have been adequately addressed and the implementation of CAPA will be verified at the next inspection.

12. Premises

Layouts of the facilities were made available. The site consisted of three major buildings. Building 1 comprised of 4 floors. The utilities area was found on the first floor. Raw and packaging materials were stored on the second floor. On the third floor, the non-sterile production area was located along with the finished product warehouse. The injection manufacturing area was found on the fourth floor along with the QC laboratories and QA office. On the first floor of Building 2 packaging materials were stored. On the first floor of Building 11 the retention sample area and FPP storage were located, while the second floor housed the QC laboratories. In general, premises were constructed, designed, and maintained to suit the operations to be carried out and prevent the risk of contamination of materials and products. At large, the design of premises was such as to minimize the risk of errors and permit effective cleaning and maintenance.

Any observations related to this section have been adequately addressed and the implementation of CAPA will be verified at the next inspection.

13. Equipment

Appropriate equipment was available and met the appropriate standards and specifications for manufacturing the products on-site. Logbooks for maintenance and cleaning were kept. Records of calibrations and qualifications were made available. In general, equipment reviewed, and logbooks checked during the tour of the facilities indicated that preventive maintenance and challenge tests were performed according to written procedures and working instructions.

Any observations related to this section have been adequately addressed and the implementation of CAPA will be verified at the next inspection.

14. Materials

There were procedures in place for the receipt, labelling, sampling, testing and release of materials. An ERP system was used for the registration and management of materials. Material receipt labels

were generated by the ERP system. There were appropriate areas in the warehouse for the receipt, and quarantine of materials. Released materials were stored in a separate area.

15. Documentation

The company had defined in their QM the documentation system which was in a hierarchical structure including on the top level the QM and Policy, then the SOPs, Work Instructions (WI) and on the bottom of the pyramid forms and records. The company used a hybrid documentation system where EDMS (MCD) was used as the default method for all quality documents including but not limited to SOPs, Working Instructions, change control, and deviations. Only templates that needed to be filled out were printed out. The process of printing was controlled by the manufacturing team and the QA department. The SOP on writing SOPs, Work Instructions and Flow Charts were reviewed.

Any observations related to this section have been adequately addressed and the implementation of CAPA will be verified at the next inspection.

16. Good practices in production

The inspectors visited the production areas the second day of the inspection and observed dispensing and production activities while they spot- checked calibration, maintenance, cleaning, and batch records. There were instructions in place for the dispensing order of materials and for labelling dispensed materials. Cleaning of the dispensary was conducted according to written Working Instructions. There were three types of cleaning, partial cleaning, full cleaning, and cleaning under the floor-scales (performed once a month). In addition, there were working instructions for the startup and operation of the dispensary. Similarly, there were procedures and instructions in place for performing line clearance. The capsule filling operations at the capsule filling line were observed. The challenge test of the metal detector was reviewed. IPC was conducted during the set-up of the filling machine while during the filling, automatic capsule weight controls were performed, and the printouts were included in the BMR. Additionally, the inspectors observed the primary packaging activities at the blister packaging line. The line was equipped with a camera that could detect different defects (i.e., empty blister/empty pocket, different color tablet, more than one tablet in a pocket). The challenge test on the camera was performed before the start of the blistering operation. Line clearance was performed and was appropriately documented in the BPR.
Finally, the inspectors visited the area where the Clofazimine bottle packaging line was located. The product was packed in flip-cap bottles.
In general, records were maintained. BMRs and BPRs included appropriate instructions and were contemporaneously completed and checked.

Any observations related to this section have been adequately addressed and the implementation of CAPA will be verified at the next inspection.

17. Good practices in quality control

Quality control operations were independent of production and the laboratories were separated from the production areas and tasked with the sampling and physical, chemical, instrumental, and microbiological analysis of starting, packaging, and intermediate materials, as well as finished pharmaceutical products. Additionally, the QC team was tasked with the qualification and calibration of analytical equipment and the validation of analytical methods. The QC laboratories were located on the 4th floor of Building 1. A separate area on the same floor housed 17 stability chambers. In addition, QC laboratories were also

located on the 2nd floor of Building 11 while retention samples were stored on the 1st floor of the same building. The QC laboratory was appropriately organized and equipped. Analytical equipment was installed in separate rooms and logbooks for use and maintenance of equipment were presented. The following specifications procedures and records were reviewed:
The working instructions for working standards.
The method to integrate chromatographs.
The HPLC and CG column management and inspection procedure.
The test and sampling method and sampling quantity for packaging materials.
The Clofazimine API analytical method.
The Clofazimine API specifications.
Examples of Clofazimine API analytical records.
The Clofazimine 100mg soft gel caps analytical method.
The Clofazimine 100mg soft gel caps specifications.
Examples of Clofazimine 100mg soft gel caps analytical reports- assay.
The determination of Clofazimine Compound B content.

Any observations related to this section have been adequately addressed and the implementation of CAPA will be verified at the next inspection.

Part 3	**Conclusion – Inspection outcome**

Based on the areas inspected, the people met and the documents reviewed, and considering the findings of the inspection, including the observations listed in the Inspection Report, ***Dong-A St Co. Ltd.,*** located at ***2F Section B, 3F, 4F Section B, 200-23. Baekseokgongdan 1-ro, Seobuk-gu, Cheonan-si, Chungcheongnam-do, 31093, Republic of Korea*** was considered to be operating at an acceptable level of compliance with WHO GMP Guidelines.

All the non-compliances observed during the inspection that were listed in the full report as well as those reflected in the WHOPIR, were addressed by the manufacturer, to a satisfactory level, prior to the publication of the WHOPIR

This WHOPIR will remain valid for 3 years, provided that the outcome of any inspection conducted during this period is positive.

Part 4	**List of WHO Guidelines referenced in the inspection report**

1. WHO good manufacturing practices for pharmaceutical products: main principles. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-eight Report Geneva, World Health Organization, 2014 (WHO Technical Report Series, No. 986), Annex 2.
   Short name: WHO TRS No. 986, Annex 2
   https://www.who.int/publications/m/item/trs986-annex2

2. WHO good manufacturing practices for active pharmaceutical ingredients. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-fourth Report. Geneva, World Health Organization, 2010 (WHO Technical Report Series, No. 957), Annex 2.

Short name: WHO TRS No. 957, Annex 2
https://www.who.int/publications/m/item/annex-2-trs-957

3. WHO guidance on good practices for desk assessment of compliance with good manufacturing practices, good laboratory practices and good clinical practices for medical products regulatory decisions. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Fifty-second Report. Geneva, World Health Organization, 2018 (WHO Technical Report Series, No. 1010), Annex 9.
Short name: WHO TRS 1010, Annex 9
https://www.who.int/publications/m/item/trs1010-annex9

4. WHO Good Manufacturing Practices: water for pharmaceutical use. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Fifty-fifth Report. Geneva, World Health Organization, 2021 (WHO Technical Report Series, No. 1033), Annex 3.
Short name: WHO TRS No. 1033, Annex 3
https://www.who.int/publications/m/item/annex-3-trs-1033

5. WHO guidelines for sampling of pharmaceutical products and related materials. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Thirty-ninth Report. Geneva, World Health Organization, 2005 (WHO Technical Report Series, No. 929), Annex 4.
Short name: WHO TRS No. 929, Annex 4
https://www.who.int/publications/m/item/annex-4-trs-929

6. WHO good practices for pharmaceutical quality control laboratories. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Fifty-seventh Report. Geneva, World Health Organization, 2024 (WHO Technical Report Series, No. 1052), Annex 4.
Short name: WHO TRS No. 1052, Annex 4
https://www.who.int/publications/i/item/9789240091030

7. WHO Good Practices for Pharmaceutical Products Containing Hazardous Substances. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-fourth Report. Geneva, World Health Organization, 2010 (WHO Technical Report Series, No. 957), Annex 3.
Short name: WHO TRS No. 957, Annex 3
https://www.who.int/publications/m/item/trs957-annex3

8. Guidelines on heating, ventilation and air-conditioning systems for non-sterile pharmaceutical products. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Fifty Second Report Geneva, World Health Organization, 2018 (WHO Technical Report Series, No. 1010), Annex 8.
Short name: WHO TRS No. 1010, Annex 8
https://www.who.int/publications/m/item/Annex-8-trs-1010

9. Guidelines on heating, ventilation and air-conditioning systems for non-sterile pharmaceutical products. Part 2: Interpretation of Guidelines on heating, ventilation and air-conditioning systems for non-sterile pharmaceutical products. WHO Expert Committee on Specifications for

Pharmaceutical Preparations. Fifty-Third Report Geneva, World Health Organization, 2018 (WHO Technical Report Series, No. 1019), Annex 2.
Short name: WHO TRS No. 1019, Annex 2
https://www.who.int/publications/m/item/trs1019-annex2

10. WHO guidelines on transfer of technology in pharmaceutical manufacturing WHO Expert Committee on Specifications for Pharmaceutical Preparations. Fifty-Fifth Report Geneva, World Health Organization, 2022 (WHO Technical Report Series, No. 1044), Annex 4.
Short name: WHO TRS No. 1044, Annex 4
https://cdn.who.int/media/docs/default-source/medicines/norms-and-standards/guidelines/production/trs1044-annex4-technology-transfer-in-pharmaceutical-manufacturing.pdf

11. WHO good manufacturing practices for sterile pharmaceutical products. Expert Committee on Specifications for Pharmaceutical Preparations. Fifty-Fifth Report Geneva, World Health Organization, 2022 (WHO Technical Report Series, No. 1044), Annex 4.
Short name: WHO TRS No. 1044, Annex 2
https://www.who.int/publications/m/item/trs1044-annex2

12. General guidelines for the establishment maintenance and distribution of chemical reference substances. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-First Report Geneva, World Health Organization 2007 (WHO Technical Report Series, No.943) Annex 3. ***Short name: WHO TRS No. 943, Annex 3***
https://www.who.int/publications/m/item/trs943-annex3

13. WHO good practices for pharmaceutical microbiology laboratories. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-Fifth Report Geneva, World Health Organization, 2011 (WHO Technical Report Series, No. 961), Annex 2.
Short name: WHO TRS No. 961, Annex 2
https://www.who.int/publications/m/item/trs961-annex2

14. WHO guidelines on quality risk management. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-Seventh Report Geneva, World Health Organization, 2013 (WHO Technical Report Series, No. 981), Annex 2.
Short name: WHO TRS No. 981, Annex 2
https://www.who.int/publications/m/item/trs981-annex2

15. WHO guidelines on variation to a prequalified product. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-Seventh Report Geneva, World Health Organization, 2013 (WHO Technical Report Series, No. 981), Annex 3.
Short name: WHO TRS No. 981, Annex 3
https://www.who.int/publications/m/item/annex-3-trs-981

16. WHO guidelines for drafting a site master file. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-Fifth Report Geneva, World Health Organization, 2011 (WHO Technical Report Series, No. 961), Annex 14.

Short name: WHO TRS No. 961, Annex 14
https://www.who.int/publications/m/item/tr961-annex14

17. Good Manufacturing Practices: Guidelines on validation. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Fifty-Third Report Geneva, World Health Organization, 2019 (WHO Technical Report Series, No. 1019), Annex 3.
Short name: WHO TRS No. 1019, Annex 3
https://www.who.int/publications/m/item/trs1019-annex3

18. WHO General guidance on hold-time studies WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-Ninth Report Geneva, World Health Organization, 2015 (WHO Technical Report Series, No. 992), Annex 4.
Short name: WHO TRS No. 992, Annex 4
https://www.who.int/publications/m/item/trs992-annex4

19. Model guidance for the storage and transport of time-and temperature-sensitive pharmaceutical products. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-Fifth Report Geneva, World Health Organization, 2011 (WHO Technical Report Series, No. 961), Annex 9.
Short name: WHO TRS No. 961, Annex 9
https://www.who.int/publications/m/item/trs961-annex9-modelguidanceforstoragetransport

20. WHO Technical supplements to Model Guidance for storage and transport of time – and temperature – sensitive pharmaceutical products. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-Ninth Report Geneva, World Health Organization, 2015 (WHO Technical Report Series, No. 992), Annex 5.
Short name: WHO TRS No. 992, Annex 5
https://www.who.int/publications/m/item/trs992-annex5

21. WHO Recommendations for quality requirements when plant – derived artemisinin is used as a starting material in the production of antimalarial active pharmaceutical ingredients. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-Ninth Report Geneva, World Health Organization, 2015 (WHO Technical Report Series, No. 992), Annex 6.
Short name: WHO TRS No. 992, Annex 6
https://www.who.int/publications/m/item/trs-992-annex-6

22. Guideline on data integrity. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Fifty-Fifth Report Geneva, World Health Organization, 2021 (WHO Technical Report Series, No. 1033), Annex 4.
Short name: WHO TRS No. 1033, Annex 4
https://www.who.int/publications/m/item/annex-4-trs-1033

23. WHO general guidance on variations to multisource pharmaceutical products. *WHO Expert Committee on Specifications for Pharmaceutical Preparations. Fifties Report* Geneva, World Health Organization, 2016 (WHO Technical Report Series, No. 996), Annex 10.
Short name: WHO TRS No. 996, Annex 10

https://www.who.int/publications/m/item/trs966-annex10

24. Stability testing of active pharmaceutical ingredients and finished pharmaceutical products. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Fifty-Second Report Geneva, World Health Organization, 2018 (WHO Technical Report Series, No. 1010), Annex 10. ***Short name: WHO TRS No. 1010, Annex 10***
https://www.who.int/publications/m/item/trs1010-annex10

25. Points to consider when including Health-Based Exposure Limits in cleaning validation. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Fifty-Fifth Report Geneva, World Health Organization, 2021 (WHO Technical Report Series, No. 1033), Annex 2.
Short name: WHO TRS No. 1033, Annex 2
https://www.who.int/publications/m/item/annex-2-trs-1033

26. Points to consider for manufacturers and inspectors: environmental aspects of manufacturing for the prevention of antimicrobial resistance. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Fifty-Fourth Report Geneva, World Health Organization, 2020 (WHO Technical Report Series, No. 1025), Annex 6.
Short name: WHO TRS No. 1025, Annex 6
https://www.who.int/publications/m/item/trs-1025-annex-6

27. Production of water for injection by means other than distillation. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Fifty-Fourth Report. Geneva, World Health Organization, 2020 (WHO Technical Report Series, No. 1025), Annex 3.
Short name: WHO TRS No. 1025, Annex 3
https://www.who.int/publications/m/item/trs-1025-annex-3-water-for-injection

27. Good chromatography practice. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Fifty-Fourth Report. Geneva, World Health Organization, 2020 (WHO Technical Report Series, No. 1025), Annex 4.
Short name: WHO TRS No. 1025, Annex 4
https://www.who.int/publications/m/item/trs1025-annex4

28. Good trade and distribution practices for pharmaceutical starting materials. *WHO Expert Committee on Specifications for Pharmaceutical Preparations. Fifties Report* Geneva, World Health Organization, 2016 (WHO Technical Report Series, No. 996), Annex 6.
Short name: WHO TRS No. 996, Annex 6
https://www.who.int/publications/m/item/annex-6-trs-996

29. WHO guidelines for preparing a laboratory information file. *WHO Expert Committee on Specifications for Pharmaceutical Preparations.* Forty-Fifth Report Geneva, World Health Organization, 2011 (WHO Technical Report Series, No. 961), Annex 13.
Short name: WHO TRS No. 961, Annex 13
https://www.who.int/publications/m/item/trs961-annex13

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