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Prequalification Team Inspection services
WHO PUBLIC INSPECTION REPORT
of the Active Pharmaceutical Ingredient (API) Manufacturer

Part 1	**General information**
Manufacturers Details	
Company information	
Name of manufacturer and address	**Livzon Group Fuzhou Fuxing Pharmaceutical Co. Ltd.** Jiangyin Industrial Concentration Zone Fuqing, Fuzhou, Fujian, China (People's Republic of) North latitude: N25°27′38.75″ East longitude: E119°17′14.35″ D-U-N-S Number: 421260459
Corporate address of manufacturer	Jiangyin Industrial Concentration Zone, Fuqing, Fuzhou City, Fujian Province, China Tel: +86-591-85966928 Fax: +86-591-85966925
Inspected site	
Address of inspected manufacturing site if different from that given above	As above
Buildings	• Building No 1 – Strains Centre • Building 4 – Fermentation and Engineering 2 • Building No 7 - Extraction department No 1, KMS production line • Building 11 – Refinement department No 1, KAS spray-drying production line, manufacturing from KMS, and the sterilization, filling and packing of KAS.
Manufacturing license number	20160089, valid till 2020 December 31. Scope – manufacture of non-sterile and sterile API
Inspection details	
Dates of inspection	13-17 March 2017
Type of inspection	Routine
Representative from the National Regulatory Authority	None. The local authority was informed by the WHO in advance about the upcoming inspection.

<table>
<tr><th>Introduction</th><th></th></tr>
<tr><td>Brief summary of the manufacturing activities</td><td>The manufacturer was involved in the manufacturing, packaging, labeling, testing and storage of the API and/or preparation such as Vancomycin hydrochloride-Precipitated, Vancomycin hydrochloride-Lyophilized, Daptomycin, Milbemycin Oxime, Kanamycin sulfate, Colistimethate sodium, Kanamycin acid sulfate, Colistin sulfate, Colistin sulfate premix 10%.</td></tr>
<tr><td>General information about the company and site</td><td>Livzon Group Fuzhou Fuxing Pharmaceutical Co Ltd was founded in 1979 as state-owned company. In 2004 the site was acquired by Livzon group. Jiangying plant is in operation since 2005.</td></tr>
<tr><td>History</td><td>The site was inspected by WHO:
December 2012
February 2014
July 2015
The site was inspected by the following authorities:
<table>
<tr><th>Dates</th><th>Inspection Authority</th><th>Scope of inspection</th></tr>
<tr><td>November 2011</td><td>Food and Drug Administration, USA</td><td>Factory inspection</td></tr>
<tr><td>October 2011</td><td>Chinese Ministry of Agriculture</td><td>Colistin sulfate</td></tr>
<tr><td>May 2013</td><td>Ministerium fur Soziales, Gesundheit, Frauen und Familie, Germany</td><td>Vancomycin hydrochloride, Precipitated (API) and Teicoplanin (API)</td></tr>
<tr><td>July 2013</td><td>Freie Hansestadt Bremen, Der Senator für Gesundheit</td><td>Colistin Sulfate(API) and Colipur</td></tr>
<tr><td>February 2014</td><td>WHO</td><td>Kanamycin Sulfate (API) and Kanamycin acid Sulfate (API)</td></tr>
<tr><td>March 2015</td><td>Food and Drug Administration, USA</td><td>Factory inspection / Vancomycin hydrochloride lyophilized (API) pre-approval inspection</td></tr>
<tr><td>July 2015</td><td>WHO</td><td>Kanamycin Sulfate (API) & Kanamycin acid Sulfate (API)</td></tr>
<tr><td>April 2016</td><td>Ministeilum fur Soziales, Gesundheit, Frauen und Familie, Germany</td><td>Vancomycin hydrochloride, Precipitated (API) and Teicoplanin (API)</td></tr>
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<tr><td>Brief report of inspection activities undertaken</td><td></td></tr>
<tr><td>Scope and limitations</td><td></td></tr>
<tr><td>Areas inspected</td><td>Pharmaceutical Quality System
Documentation system
Production System</td></tr>
</table>

	• Facilities and Equipment System • Laboratory Control System • Materials System • Packaging and labelling system
Restrictions	None
WHO product numbers covered by the inspection	APIMF241 Kanamycin (acid sulfate) – sterile (**KAS**) APIMF246 Kanamycin sulfate - non sterile (**KMS**)

Abbreviations

AHU	air handling unit
ALCOA	attributable, legible, contemporaneous, original and accurate
AQL	Acceptance quality limit
API	active pharmaceutical ingredient
APQR	annual product quality review
BDL	below detection limit
BMR	batch manufacturing record
BPR	batch packaging record
CAPA	corrective actions and preventive actions
CC	change control
CFU	colony-forming unit
CoA	certificate of analysis
CpK	process capability index
DQ	design qualification
EM	environmental monitoring
FAT	factory acceptance test
FBD	fluid bed dryer
FG	finished goods
FMEA	failure modes and effects analysis
FPP	finished pharmaceutical product
FTA	fault tree analysis
FTIR	Fourier transform infrared spectrometer
GC	gas chromatograph
GMP	good manufacturing practice
HACCP	hazard analysis and critical control points
HPLC	high-performance liquid chromatograph
HVAC	heating, ventilation and air conditioning
ID	identity
IR	infrared spectrophotometer
IPC	In process control
IQ	installation qualification
KF	Karl Fisher
LAF	laminar air flow
LIMS	laboratory information management system
LoD	limit of detection
LOD	loss on drying
MB	microbiology
MBL	microbiology laboratory

MF	master formulae
MR	management review
NIR	near-infrared spectroscopy
NMR	nuclear magnetic resonance spectroscopy
NRA	national regulatory agency
OQ	operational qualification
PHA	preliminary hazard analysis
PM	preventive maintenance
PpK	process performance index
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
RH	relative humidity
RM	raw materials
RS	reference standard
SAP	system applications products for data processing
SFG	semi-finished goods
SOP	standard operating procedure
STP	standard test procedure
T	temperature
TAMC	total aerobic microbial count
TFC	total fungal count
TLC	thin layer chromatography
TMC	total microbial count
TOC	Total organic carbon
URS	user requirements specifications
UV	ultraviolet-visible spectrophotometer
VMP	Validation Master Plan
WFI	water for injection
WS	working standard

Part 2	Brief summary of the findings and comments (where applicable)

Brief summary of the findings and comments

1. Pharmaceutical quality system

In general the system for managing quality encompassed the organizational structure, procedures and processes. There were QA and QC departments that were independent of production. In general deviations from established procedures were documented and explained. Procedure was in place for notifying responsible management of regulatory inspections, serious GMP deficiencies, product defects and related actions.

The traceability of records and documentation system were satisfactory. The company was also being certified for ISO9001:2008 Standard, ISO 14001: 2004 Standard and OHSAS 18001: 2007 Standard.

Responsibilities of the quality unit

The quality unit was responsible for testing, sampling, stability study, handling out of specification (OOS)/(OOT) out of trends results, established specification, environmental monitoring, release and reject of materials and API, issuance of certificate of analysis (CoA), out sourcing of quality control test and involved in activities related to qualification and validation.

The SOP "Job Description Quality Director" as an authorized person to release and reject the product was discussed.

Responsibilities of production unit

The production unit was responsible for manufacturing of KMS and KAS, storage of starting materials, dispensing, packing and labelling.

Responsibilities of equipment and engineering unit

Equipment and Engineering Head reported directly to the General Manager. The SOP "Job Description: Manager of Equipment Power Department" was discussed. The responsibilities cover utilities, equipment and support systems.

Product Quality Review (PQR)

The SOP "Annual product quality review" was discussed. The PQR covered, but not limited:

- Critical in-process control and critical API test results,
- Batches that failed to meet established specifications,
- All critical deviations or non-conformances and related investigations,
- Any changes carried out to the processes or analytical methods,
- Results of the stability monitoring programme,
- Reworked and reprocessed batches,
- Quality-related returns, complaints and recalls,
- OOS / OOT,
- Adequacy of corrective actions,
- Validation and qualification,
- Utilities.

PQR is performed annually and according to the SOP should be completed by the March following year.

PQR for KMS January – December 2016 and PQR KAS January – December 2016 were discussed.

Quality risk management (QRM)
The SOP "Procedure for quality risk management" and log book were discussed. Tools specified in the SOP were:

- Failure modes and effects analysis (FMEA)
- Fault tree analysis (FTA)
- Hazard Operability Analysis (HAZOP)
- Ishikawa diagram

For risk assessment (RA) mainly FMEA and Ishikawa diagram were used.

Risk assessment "RA for KAS" was discussed. RA was performed using FMEA from the first production step (solution preparation) and covered risk identification and mitigation steps.

Risk assessment "RA for quality control chromatography system" was discussed. RA was performed using FMEA.

Deviations
The SOP "Handling of deviations", its flow chart and register were discussed. SOP was applicable to planned and unplanned deviations. Register was month wise. Deviation number was recorded in batch manufacturing / packaging records.

Deviations were classified as:

- Minor (unplanned)
- Major (unplanned)
- Planned

Qualified person (QP) was responsible for classification of unplanned deviations and final approval.
QA staff members were responsible for investigation of deviation and corrective actions and preventive actions (CAPA).

Root cause analysis (RCA)
The SOP "Procedure for investigation report" and register were discussed. RCA was performed by "Brain storming" or Ishikawa diagram. Register was month wise.

RCA No XX was discussed. RCA was linked to the deviation No YY. Ishikawa diagram was used for RCA.

Corrective actions and preventive actions (CAPA)
The SOP "Investigation and CAPA management", its flow chart and register were discussed. Register was month wise. The SOP was applicable, but not limited to:

- Deviations,
- OOS,
- Rejects,
- Complaints,
- Validation/qualification,
- Recall.

CAPA No XX related to the deviation No YY and RCA No ZZ were discussed.

Change control (CC)
The SOP "Change control", its flow chart and register were discussed. CCs were classified by QA department as:

- Minor,
- Major.

The changes were initiated by the concerned departments. The SOP was applicable for all GMP related activities.

Complaints
The SOP "Complaints handling" and register were discussed. Complaints were classified as:

- Minor,
- Major.

According to the SOP complaints investigation was performed by the team, headed by QP.

Recall
The SOP "Product recall & market withdrawal" was discussed. There were no product recalls in company history. According to the SOP a mock recall should be performed once in two years for domestic market and overseas markets.

Recalls were classified as following:

- Class I – should be initiated within 24 hours,
- Class II - should be initiated within 48 hours,
- Class III - should be initiated within 72 hours.

Last class III mock recall was performed in December 2016 for overseas market.

Self-inspection

The SOP "Internal audit (self-inspection)" was discussed. According to the SOP the following, but not limited items should be covered during internal audit:

- Personnel,
- Production,
- Quality management,
- Hygiene,
- Materials management,
- Documents and records management,
- Validation / qualification,
- Distribution,
- Returns,
- Complains,
- Adverse reactions,
- Other GMP related items.

Internal audits were performed by team at least annually for above listed items. Internal audit for 2017 was scheduled in August for 5 continuous days. According to the SOP conflicts of interests should be avoided. Team members training files were available. Audits were performed using department wise check lists. Observations were recorded and classified. CAPAs were submitted by the audited department and evaluated by QA. Follow-up was performed by QA.

Supplier qualification

The SOP "Vendors qualification" and its flow chart were discussed. The SOP was applicable for all raw and packaging materials vendors. Candidate vendors were selected by the purchase department and if vendor was selected as acceptable, samples from three consecutive batches were requested. Samples were tested by QC, production and R&D performed trial production. Outcome of trial production was evaluated by the QA. QA performed audits of key starting materials and primary packaging materials. Non-critical materials audits were based on questionnaires. Re-evaluation of qualified suppliers were performed periodically, re-audits were performed every three years by audit team which consisted of representative from QA, QC and purchase department.

Approved suppliers list was presented to the inspectors. Adding of new suppliers was performed via change control procedure. Approved suppliers list was reviewed twice per year.

2017 vendors audit schedules for KAS and KMS was presented to the inspectors.

AL cans manufacturer audit was performed QC manager, QA supervisor and purchase department manager. Audit was performed using 6 systems approach. Before on-site audit a questionnaire was sent and response evaluated.

According to the SOP if deficiencies were identified, CAPAs were requested and evaluated. If required follow-up audit was performed.

The SOP "GMP service provider's management" and a list of GMP service providers were discussed.

Personnel

The current organization chart of the company was prepared in accordance to SOP "Regulation of Company Organization and Structure". Key personnel including the Manufacture Head and the Quality Head were found to be independent of each other.

The company had sufficient number of personnel with responsibilities according to their respective unit and department; and every key personnel had their specific Job Description.

According to the company presentation, the site employed approximately 577 full time employees:

Total	577
Quality Unit	70
Production	329
Warehouse	15
Safety Environment & EHS	28
Marketing	20
R&D	22
Other	93

Personnel were wearing clothing suitable for the manufacturing activities.

Personnel were trained according to the SOP "Regulation of Employee Training Personnel" and the effectiveness of training was discussed.

2. Documentation system

Documents related to the manufacture of intermediates and APIs were prepared, reviewed, approved and distributed according to written procedures.

The following, but not limited, SOPs were discussed:

- SOP "GMP drafting and revision"
- SOP "GMP documentation annual review"
- SOP "Product returns"
- SOP "Procedure for non-conformance material review"
- SOP "Procedure for inoculums preparation for kanamycin"
- SOP "Personnel in / out procedure for clean areas"
- SOP "Regulation of Employee Health Monitoring"
- SOP "Procedure for Batch Number Management"
- SOP "Procedure for Reprocessing and Reworking"
- SOP "Guidance for Building and Facilities Qualification"
- SOP "Guidance for Cleaning Validation"
- SOP "Procedure for Measuring Instrument Management"
- SOP "Procedure for Handling and Investigating Out of Specification (OOS) and Atypical Results"
- SOP "Cleaning of clean area garments"

- SOP "AL tin primary cleaning"
- SOP "AL tin secondary cleaning and sterilisation".

The Logbook, XX "Record for Product Release Logbook for Kanamycin Monosulfate", and YY "Product Release Logbook for Kanamycin Acid Sulfate" were checked.

Releasing and rejection of batch and materials were done according to SOP "Procedure for Product Releasing". Critical information like production records and analytical test results were reviewed prior release and signed by the authorized personnel.

BMR of KAM, batch number XX and KAS batch number YY were discussed. The analytical records and print out from test equipment were attached accordingly.

Traceability for test result of pyrogens and abnormal toxicity test by external laboratory were verified. Results were attached together with the BMR. The KAS, BN SSK1607002 was discussed.

The certificates of analysis were prepared according to the SOP "Procedure for Report and Distribution of Test Results".

The VMP "Validation Master Plan for 2017" was discussed. The document covered computer system validation, cleaning validation, analytical method validation, utilities and processes. The VMP was supported by the SOP "Procedure of Qualification and Validation".

3. Production system

In general production operations followed defined procedures. Deviations from procedures were recorded and investigated. Access to production premises was restricted to authorized personnel. Weighing and measuring devices were of suitable accuracy for the intended use. Deviations were documented and explained. Major deviations were investigated. The processing status of major units of equipment was indicated.

Building No 1

During inspection Stain centre, located at building No. 1 was visited. Work with KMS cell cultures was performed in dedicated rooms.

Cell cultivation was performed at XX ºC. It was said, that temperature mapping studies were performed; the report was not checked during the inspection.

Master strains were stored in deep freezers. Temperature (T) in freezer was recorded every 6 minutes on charts and checked once per day. Freezer was equipped with alarm system which was challenged twice per year. In case of alarm, responsible persons will receive SMS. Freezers were connected to the UPS power back up system.

Building No 4, Fermentation Engineering No 2

Fermentation process was performed in Building No. 4 in KMS dedicated room and dedicated equipment. Starting from fermentation till crystallisation manufacturing process was performed in close system. In-process control laboratory was located in the building.

Building No 7 Extraction workshop
Extraction process, crystallisation and packaging of KMS were performed in dedicated rooms using dedicated equipment. Starting from crystallisation step manufacturing operations was carried out in classified grade C areas.

Building No. 11, Refinement workshop No 1
KAS was manufactured in dedicated room using dedicated equipment.
Starting from solution preparation manufacturing process was performed in close systems.

The SOP "Environmental monitoring (EM) for No 1 clean area" and EM trends for 2016 were discussed. Settle plate locations were established based on RA.

AL cans No. X integrity validation protocol No YY was discussed. Study was performed using tryptic soy broth (TSB) media.

4. Facilities and equipment system
Buildings and facilities used in the manufacture of intermediates and APIs were located, designed, and constructed to facilitate cleaning, maintenance and operations as appropriate to the type and stage of manufacture. Facilities were designed to minimize potential contamination. Adequate space was provided for orderly placement of equipment and materials to prevent mix-ups and contamination. Generally permanently installed pipework was appropriately identified.

The SOP "Coding and calibration of measuring instruments" and calibration schedule were discussed. The SOP was applicable to all measuring instruments, including lab instruments. Spot cross-checks showed that the schedule was followed.

HVAC and water systems
HVAC, PW and WFI systems were visited during the inspection. Generally systems were well maintained. HVAC and water systems were qualified and monitored.

Autoclave re-qualification
Pure steam sterilizer re-qualification report was discussed. Autoclave re-qualification was performed every year for all loads. Autoclave was used for sterilisation of:
- Rubber gaskets,
- Garments,
- Cleaning tools.

Pure steam generation system No X re-qualification report No YY was discussed. Pure steam generation system re-qualification was performed every year. The following tests were performed by contractor every six months:
- Non-condensable gases,
- Superheat,
- Dryness.

Aseptic process validation

Aseptic process validation was performed twice per year. Worst case/critical interventions were listed. List of persons participated in the media fills was attached to the protocol.

Dry heat steriliser re-qualification

Dry sterilization box re-qualification report No X was discussed. Dry sterilization box re-qualification was performed every year. HEPA filter integrity test was performed once per year.

HVAC system re-qualification

HVAC system re-qualification report No X was discussed. The following tests were performed:

- Air changes per hour and air velocity,
- HEPA filters integrity test
- Pressure differentials,
- Clean up rate,
- T & RH,
- Non-viable particles,
- Viable particles.

Water system

The SOP "Procedure for daily monitoring of pharmaceutical process water" and water systems (PW and WFI) layouts were discussed. Action and alert limits were established.

Computer System

As total of 4 software (HPLC, Waters Empower 3, TOC Control V and Microscope B-383POL) were listed for validation; two software were validated before 2017, another two software's were validated in February 2017.

5. Laboratory control system

Laboratory areas were separated from production areas.

API reserve samples were retained for one year after the expiry date and stored in the same packaging system in which the API was stored. KMS and KAS retention samples were stored at 15 – 25 ºC.

The temperature in the stability chambers were continuously recorded and monitored twice per day. In case of alarm responsible persons will receive SMS. UPS was provided for stability chambers.

Analytical balances with appropriate range were used. Balances were calibrated daily and every six months. Standard weights calibration certificate was presented to the inspectors.

Reference and working standards were stored in freezer at 2 – 8 ºC; temperature was continuously recorded on charts and checked daily. The freezer was equipped with alarm system. In case of alarm responsible persons will receive SMS.

SOP "Reference standard (RS) management" and SOP "Kanamycin mono sulfate working standard (WS)" were discussed. WS standards were standardized against RS.

The SOP "Electronic data management" was discussed.

The SOP "Procedure for Waters Empower 3" was discussed. HPLC software had six access levels.

The SOP "Empower 3 audit trail review" was discussed. HPLC and other equipment audit trails were reviewed against printed audit trails for each analysis.

The SOP "KAS sampling procedure" was discussed.

The SOP "Sampling of raw materials" was discussed. The SOP was applicable for raw and packaging materials sampling. Process water sampling was described in the SOP "Daily monitoring of pharmaceutical process water".

SOP "In-house specification of medicinal Aluminum bottle" and SOP "Procedure for Aluminum bottle testing" were discussed.

6. Materials system

There was one raw materials warehouse for KMS and KAS. Solid raw materials, reagents and liquid raw materials were stored in separate rooms. Separate rooms were provided for solid and liquid materials sampling and dispensing. Sampling and dispensing rooms were provided with local dust extraction systems. Rejected materials were
stored in locked cage; quarantine of materials was using yellow color strips. Approved suppliers list was available in the warehouse. Separate room was provided for utensils cleaning.

KAS and KMS finished APIs were stored in finished products warehouse No X. T and RH limits were specified 15 – 25 ºC and ≤75%. T and RH were checked twice per day.

7. Packaging and labelling system

Primary packaging materials were stored in the warehouse No Y. PE bags were sampled in grade "C" area in production department.

Upon receipt labels were stored in warehouse in locked cabinets and after release transferred to the QA department. Upon production request labels were sent to workshops, manufacturing and expiry dates and batch numbers were printed in Workshops.

PART 3

Conclusion

Based on the areas inspected, the people met and the documents reviewed, and considering the findings of the inspection, including the deficiencies listed in the Inspection Report, as well as corrective actions taken and planned:

- APIMF241 Kanamycin (acid sulfate) – sterile (KAS)
- APIMF246 Kanamycin sulfate - non sterile (KMS)

manufactured at Livzon Group Fuzhou Fuxing Pharmaceutical Co. Ltd., located at Jiangyin Industrial Concentration Zone Fuqing, Fuzhou, Fujian, China (People's Republic of), was considered to be manufactured in compliance with applicable sections of WHO GMP for Active Pharmaceutical Ingredients.

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 GMP guidelines used for assessing compliance

1. 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
   http://www.who.int/medicines/publications/44threport/en/

2. 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.
   http://www.who.int/medicines/areas/quality_safety/quality_assurance/expert_committee/trs_986/en/
   Short name: WHO TRS No. 986, Annex 2

3. WHO good manufacturing practices for sterile 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 6
   Short name: WHO TRS No. 961, Annex 6
   http://whqlibdoc.who.int/trs/WHO_TRS_961_eng.pdf?ua=1

4. WHO Good Manufacturing Practices: water for pharmaceutical use. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Fourth-six Report. Geneva, World Health Organization, 2012 (WHO Technical Report Series, No. 970), Annex 2
   Short name: WHO TRS No. 970, Annex 2
   http://www.who.int/medicines/areas/quality_safety/quality_assurance/expert_committee/trs_970/en/

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
   http://whqlibdoc.who.int/trs/WHO_TRS_929_eng.pdf?ua=1

6. WHO guidelines on good manufacturing practices for heating, ventilation and air-conditioning systems for non-sterile pharmaceutical dosage forms. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-Fifth Report Geneva, World Health Organization, 2011 (WHO Technical Report Series, No. 961), Annex 5
   Short name: WHO TRS No. 961, Annex 5
   http://whqlibdoc.who.int/trs/WHO_TRS_961_eng.pdf?ua=1

7. Supplementary guidelines on good manufacturing practices: validation. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Fortieth Report. Geneva, World Health Organization, 2006 (WHO Technical Report Series, No. 937), Annex 4
   Short name: WHO TRS No. 937, Annex 4
   http://whqlibdoc.who.int/trs/WHO_TRS_937_eng.pdf?ua=1

8. WHO Good Practices for Pharmaceutical Control Laboratories. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-fourth Report. Geneva, World Health Organization, 2010 (WHO Technical Report Series, No. 957, Annex 1
   Short name: WHO TRS No. 957, Annex 1
   http://www.who.int/medicines/publications/44threport/en/

9. 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 2
   Short name: WHO TRS No. 957, Annex 2
   http://www.who.int/medicines/publications/44threport/en/

10. WHO guidelines on transfer of technology in pharmaceutical manufacturing WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-Fifth Report Geneva, World Health Organization, 2011 (WHO Technical Report Series, No. 961), Annex 7
    Short name: WHO TRS No. 961, Annex 7
    http://whqlibdoc.who.int/trs/WHO_TRS_961_eng.pdf?ua=1

11. 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**
    http://whqlibdoc.who.int/trs/WHO_TRS_961_eng.pdf?ua=1

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
    http://whqlibdoc.who.int/trs/WHO_TRS_943_eng.pdf?ua=1

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
http://whqlibdoc.who.int/trs/WHO_TRS_961_eng.pdf?ua=1

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
http://www.who.int/medicines/areas/quality_safety/quality_assurance/expert_committee/trs_981/en/

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
http://www.who.int/medicines/areas/quality_safety/quality_assurance/expert_committee/trs_981/en/

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
http://whqlibdoc.who.int/trs/WHO_TRS_961_eng.pdf?ua=1

17. WHO Guidelines on good manufacturing practices: validation, Appendix 7: non-sterile process validation. WHO Expert Committee on Specifications for Pharmaceutical Preparations. Forty-Ninth Report Geneva, World Health Organization, 2015 (WHO Technical Report Series, No. 992), Annex 3
Short name: WHO TRS No. 992, Annex 3
http://www.who.int/medicines/areas/quality_safety/quality_assurance/expert_committee/WHO_TRS_992_web.pdf

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
http://www.who.int/medicines/areas/quality_safety/quality_assurance/expert_committee/WHO_TRS_992_web.pdf

19. 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
http://www.who.int/medicines/areas/quality_safety/quality_assurance/expert_committee/WHO_TRS_992_web.pdf

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