



PHARMA DEVILS

QUALITY ASSURANCE DEPARTMENT

QUALITY RISK ASSESSEMENT AND MITIGATION PLAN

QRA No.:

Name of Facility/Equipment/Utility/System/Activity/Procedure

Unit Operation: PROCESS VALIDATION

Date Of Quality Risk Assessment:

S. No.	Item/ Function	Potential Failure Mode (Failure Mode)	Potential Effect of Failure (Effect)	Potential Cause/ Mechanism of Failure	Current Control	Reference	S	O	D	Risk Priority Number (S*O*D)	Recommend- ended Actions (if any)	Post Risk			
												S	O	D	RP N S*O
Dispensing															
1.	Dispensing stage-Before start of Dispensing	<ul style="list-style-type: none"> ➤ Unapproved material gets dispense ➤ Failed material get dispense 	<ul style="list-style-type: none"> ➤ Unapproved dispense material leads to product contamination. ➤ Fails to achieve the safety, efficacy and quality of product. 	<ul style="list-style-type: none"> ➤ Lack of Qualified source of API and excipient ➤ Lack of testing specification. ➤ Lack of vendor management procedure 	<ul style="list-style-type: none"> ➤ Qualification procedure is in place and also line clearance check point is available in BMR to ensure approved & release materials are available for dispensing. ➤ Testing specifications are in place. ➤ Vendor management procedure is in place. 	Vendor Management	4	1	1	4	NA	NA	NA	NA	NA



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	At time of Dispensing	<ul style="list-style-type: none"> ➤ Fails to dispense the required quantity. ➤ Dispense material get contaminate. 	<ul style="list-style-type: none"> ➤ Inadequate result due to improper quantity dispensing and improper testing outcomes (OOS). ➤ Contamination of the area leads to product failure 	<ul style="list-style-type: none"> ➤ Due to selection of wrong capacity weighing balance. ➤ Due to lack of operational and calibration procedure of weighing balance. ➤ Due to improper environmental conditions. ➤ Due to lack of the operation and cleaning procedure for dispensing tools. ➤ Due to lack of procedure for dispensing ➤ Material dispensed by untrained personnel. ➤ No cross check during dispensing ➤ Unapproved/rejecte d material dispensed. 	<ul style="list-style-type: none"> ➤ Selection of weighing balance is depending on balance capacity and quantity of material. SOP is in place for operation and calibration procedure of weighing balances. ➤ Environmental condition check point is in place in line clearance checklist. ➤ Uses and cleaning of dispensing tool SOP is in place. ➤ Dispensing of API, excipient and PM SOPs are in place. ➤ Training has been imparted to concerned personnel's. ➤ In dispensing activity done by and checked by provision is available in BMR and verification done by before compounding. ➤ Check point is in place in BMR to check material is approved/released. 	Operation, Cleaning, Calibration and Verification of Weighing Balances, Dispensing and issuance of sterile RM and Dispensing	3	2	1	6	NA	N A	N A	NA	NA



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2.	Component preparation	➤ Failure of Component preparation and sterilization.	➤ Improper cleaning and sterilization of component leads to contamination in product.	<ul style="list-style-type: none"> ➤ Due to lack of unqualified sterilizer. ➤ Lack of component cleaning and component sterilization procedure. ➤ Steam lack or utility cut off during sterilization phase. ➤ Articles cleaning and sterilization by untrained person. ➤ Load pattern may not follow. ➤ Selection of wrong recipe. ➤ Sensor malfunctioning. ➤ Due to sterilization, material hold time cross 	<ul style="list-style-type: none"> ➤ Qualification of sterilizer has been completed. ➤ Component cleaning and sterilization SOP is in place. ➤ If the steam lack occurs during sterilization phase, alarm will generate and same shall be acknowledged by operator and cycle will be considered as abort. ➤ Training has been imparted to all concerned persons. ➤ Validated load patterns should be refers before start of activity as per respective SOP. ➤ Validated recipe and parameter has been set in autoclave PLC and controlled through password. ➤ Defined frequency in place for schedule calibration, Preventive maintenance and validation status. ➤ Sterilized hold time has been established and actual material hold time is track in BMR. 	Operation and Cleaning of Autoclave Cum Bung Processor	3	2	1	6	NA.	N A	N A	N A	N A



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3.	During Filter Integrity testing	➤ Failure in filter integrity	➤ Improper filter integrity gets direct impact on sterility of product.	<ul style="list-style-type: none"> ➤ Unqualified equipment used. ➤ Lack of cleaning and operational SOP. ➤ Filter integrity activity performed by untrained person. ➤ No cross checks provision for filter integrity test report. 	<ul style="list-style-type: none"> ➤ Qualification of filter integrity machine has been completed. ➤ Cleaning and Operational SOP is in place ➤ Training has been imparted to all concerned persons and user ID given after completion of training. ➤ Filter integrity test report (Pre and Post) shall be checked by production person and verified by QA person. 	Operation of Integrity Tester	5	1	1	5	NA	N A	N A	NA	NA



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4.	During compounding	<ul style="list-style-type: none"> Failure in Batch manufacturing 	<ul style="list-style-type: none"> Due to improper manufacturing procedure leads to bioburden may increase more than specification. Unexpected outcome like yield and concentration of product leads to product failure. 	<ul style="list-style-type: none"> Compounding procedure not available. Due to lack of calibration ,preventive maintenance, operational and cleaning procedures. Qualification of vessel system not available. Unsterlized and unclean equipment may use. Inadequate cleaning or equipment's difficult to clean. Compounding activity handle by untrained person. Due to lack of clean equipment hold time may cross. Micro growth due to utility supply such as WFI, Compressed air and nitrogen. 	<ul style="list-style-type: none"> Detail, compounding procedure is in place in BMR. Vessel calibration, preventive maintenance, operational and cleaning procedure are in place. Qualification of vessels system is completed. In line clearance of compounding activity ensure the sterilization vessels shall be mention in BMR. Vessels CIP, SIP procedure are qualified and SOP is in place. Training has been completed for all concerned persons. CIP hold time has been established. Water system compressed air and Nitrogen are qualified. 	Load Cell Verification and Calibration of Manufacturing Vessels CIP of Mixing vessel, Mixing mobile vessel, holding vessel	5	3	1	15	Sample shall be collected for QC analytical and QC microbiologica l to check the impact of CPP on CQA. CPP and CQA shall be evaluated after completion of process validation activity.	5	1	1	5



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5.	Filtration activity	➤ Failure in filtration of bulk solution	➤ Filtrate is not sterile leads to microbial growth. ➤ Improper filtration leads to contamination in product.	➤ Lack of procedure for sterilization of filter. ➤ Lack of procedure to check the filter integrity. ➤ Due to improper training to concerned persons. ➤ Lack of filtration procedures.	➤ SOP is in place for SIP of vessel system along with product transfer line. ➤ Filter integrity procedure is in place check points is available. ➤ Training procedures is in place. ➤ Filtration procedure is available in BMR.	SIP for Mixing Vessel/ MMV/ Holding Vessel/Buffer Vessel	5	3	1	15	Sample shall be collected for QC analytical and QC microbiological to check the effect of filtration.	5	1	1	5



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6.	Bulk Hold	➤ Failure in Bulk Hold	➤ During bulk solution hold period bioburden may increase more than the specification.	<ul style="list-style-type: none"> ➤ Lack of qualification of vessel system. ➤ Lack of aseptic connection. ➤ Lack of positive pressure. ➤ Due to failure of filter integrity of vent filters. ➤ Lack of provision to monitor the pressure in vessel. ➤ Due to activity handle by untrained person. ➤ Lack of established bulk hold time. 	<ul style="list-style-type: none"> ➤ Qualification of the vessel system has been completed. ➤ Aseptic connection for filtration is defined in BMR. ➤ The vessel is closed system and operated through control HMI. The vessel kept under positive pressure during bulk hold which does not allow the infiltration of microbial contaminants. ➤ The procedure is in place for pre and post filter integrity for vent filter. ➤ Magnehelic guage is there for monitoring the pressure ➤ Training procedure is in place for operation of the vessel. 	Handling of Filters	5	3	2	30	Product hold time shall be establish during process validation batches.	5	1	1	5



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7.	Vial washing	➤ Failure in vial washing	➤ Improper vial washing procedure leads to contamination ➤ Due improper cleaning particulate matter may presence in vials and leads to failure in visual inspection.	➤ Lack of qualified equipment. ➤ Lack of operational procedure. ➤ Due to activity handled by untrained person. ➤ Due to lack of cleaning operation and preventive maintenance procedure. ➤ Due to improper utility supply.	➤ Qualification has been completed for vial washing machine. ➤ Operational SOP is in place. ➤ Training has been imparted to concerned persons. ➤ Cleaning, operational and preventive maintenance procedures is in place. ➤ SOP is in place for parameter of utility supply.	Operation and Cleaning of Vial Washing Machine	5	1	1	5	NA	N A	N A	NA	NA



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8.	Tunnel operation	➤ Failure in vials depyrogenation.	<ul style="list-style-type: none"> ➤ Improper depyrogenation leads BET and sterility Failure. ➤ Failure in tunnel leads to loss of time and resources. 	<ul style="list-style-type: none"> ➤ Unqualified equipment may use. ➤ Lack of cleaning and operational procedure. ➤ Untrained person may operate machine ➤ Tunnel temperature and DP fluctuation during batch activity ➤ Selection of wrong parameters and recipe ➤ Sensor malfunctioning. 	<ul style="list-style-type: none"> ➤ Qualification has been completed for tunnel. ➤ Operational SOP is in place. ➤ Training has been imparted to concerned persons. ➤ Cleaning SOP is in place. ➤ Tunnel conveyer belt will stop automatically if sensor temperature goes out of set point. The intervention has been performed in media fill batch. ➤ Defined frequency is in place for schedule calibration, temperature sensor, Preventive maintenance and validation status of tunnel sterilizer. ➤ Validated recipe and parameter is in place. 	Operation of Cleaning of Sterilizing & Depyrogenation Tunnel	5	2	2	20		5	1	1	5



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9.	Filling operation	➤ Failure in filling and stoppering	<ul style="list-style-type: none"> ➤ Improper filling may result in volume variation. ➤ Improper filling and stoppering activity may leads to contamination. 	<ul style="list-style-type: none"> ➤ Lack of qualification procedure. ➤ Lack of cleaning and operational procedure. ➤ Unsterile parts or article may use I filling operation. ➤ Lack of environmental condition for filling. ➤ Improper handling of aseptic intervention may lead to product contamination. ➤ Operation handled by untrained and unqualified person. ➤ Due aseptic interventions ➤ Due filling duration. 	<ul style="list-style-type: none"> ➤ Qualification of filling and stoppering machine has been completed. ➤ SOP for filling machine cleaning and operation is in place. ➤ Sterilization procedure for machine parts loads is in place. ➤ Filling shall be carried out under class A condition(Unidirectional air flow area) ➤ Aseptic intervention shall be performed as per media fill protocol and BMR. ➤ Operational training has been done for all concerned persons for aseptic. ➤ Filling duration is mentioned in BMR and same was simulated in media fill. 	Operation and Cleaning of Automatic High Speed Injectable Powder Filling and Stoppering Machine	5	2	2	20	If in case any unexpected intervention will happen during batch processing same shall be documented and handled through QMS.	5	1	1	5



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10.	Capping operation	➤ Failure in vial sealing	<ul style="list-style-type: none"> ➤ Improper crimping is not providing leak proof sealing to the vials. ➤ Failure in capping activity leads to product contamination. 	<ul style="list-style-type: none"> ➤ Unqualified equipment may use. ➤ Operational and cleaning procedure may not available. ➤ Untrained person may operate machine. ➤ Lack of leak test procedure for sealed container. 	<ul style="list-style-type: none"> ➤ Qualification for capping machine has been completed. ➤ Operational and cleaning SOP is in place. ➤ Training has imparted to concerned persons. ➤ SOP is in place for leak test for sealed vial and container closer integrity test has been established in media fill batch. 	Operation & Cleaning of Filling, Dropper Fixing & Screw Capping Machine	5	1	1	5	NA	NA	NA	NA	NA



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11.	Visual Inspection	<ul style="list-style-type: none"> ➤ Failure in visual inspection 	<ul style="list-style-type: none"> ➤ Improper visual inspection of vials leads to direct impact on product quality and patient safety. ➤ Improper visual inspection to vials gets market complaints to the organization. 	<ul style="list-style-type: none"> ➤ Lack of qualification procedure for visual inspector. ➤ Lack of SOP for visual inspection procedure. ➤ Visual inspection activity done by unqualified person. ➤ Lack of cross check procedure for inspected vial. ➤ Visual inspection hood not qualified. ➤ Lack of required lux level. 	<ul style="list-style-type: none"> ➤ Visual inspector qualification procedure is in place. ➤ SOP is in place for Automatic optical inspection activity. ➤ Qualification has been completed for concerned persons. ➤ In process checks is in place for visual inspection activity and AQL is in place. 	Operation Cleaning of Automatic Visual Inspection Machine	3	1	5	15	NA	1	1	5	5
12.	Storage condition in FG	<ul style="list-style-type: none"> ➤ Improper storage space and conditions in Finished goods store. 	<ul style="list-style-type: none"> ➤ Chance of product mix-up due to lack of dedicated space. ➤ Chance of product degradation due to irrespective storage condition. 	<ul style="list-style-type: none"> ➤ Lack of SOP ➤ Lack of dedicated storage space ➤ Due to environmental condition not maintain. 	<ul style="list-style-type: none"> ➤ SOP for handling of finished good is in place. ➤ Dedicated storage space is available. ➤ Environmental condition is monitoring through BMS. 	Handling Of Finished Goods	1	1	5	5	NA	N A	N A	N A	N A



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13.	Labelling Activity	➤ Improper Labelling in Product.	➤ Improper labeling leads to adverse effect on patient health.	<ul style="list-style-type: none"> ➤ Lack of SOP of Labeling machine ➤ Lack of Line clearance and physical verification. ➤ Lack of proper Dispensing of Packing material. 	<ul style="list-style-type: none"> ➤ SOP of labeling machine is in place. ➤ Training imparted to IPQA person for Line clearance and proof check. ➤ SOP of Packing material Dispensing is in place. 	Dispensing and Issuance of Packing Material	1	1	5	5	NA	N A	N A	N A	N A
14.	Secondary Packing activity	➤ Improper packing of the product.	<ul style="list-style-type: none"> ➤ Improper packing leads to product damage. ➤ Wrong packing leads to risk on patient safety. 	<ul style="list-style-type: none"> ➤ Lack of SOP of carton packing ➤ Lack of Line clearance and physical verification. ➤ Lack of proper Dispensing of Packing material. 	<ul style="list-style-type: none"> ➤ SOP of operation and cleaning of Hi-cart carton packing machine is in place. ➤ Training imparted to IPQA person for Line clearance and proof check. ➤ SOP of Packing material Dispensing is in place. 	Operation and Cleaning of Hi-cart Cartoning Machine	1	1	5	5	NA	N A	N A	N A	N A



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Where: S=Severity; O=Occurrence Probability; D=Detection; Risk category 1-25 RPN is Low risk, 26-50 RPN is Medium Risk, 51-125 RPN is High Risk.

Name of Facility/Equipment/Utility/System/Activity/Procedure/Unit Operation: Purified water generation & distribution system

Date:

S.No.	Recommended Action	Responsible Person	Target Date of Completion
1.			
2.			

CAPA:

If required, mention CAPA No.:

Quality Risk Management Team			Reviewed By Head Operations Sign & Date	Approved By Head QA Sign & Date
Name	Department	Sign & Date		



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QUALITY RISK ASSESSEMENT AND MITIGATION SUMMARY REPORT

Name of Equipment:

Verification of Action Plan: NA

Remarks (if any): The entire above failure mode and their Severity, Occurrence, Detection rating done and RPN No. is found between 1-25. Hence Risk is detected as low which is acceptable.

Verified By
QA
Sign & Date

Approved By
Head QA
Sign & Date