PHARMA DEVILS

QUALITY ASSURANCE DEPARTMENT

Document Name: Performance Qualification test datasheet # 3.3 for Lyophilizer	
Equipment/System ID:	**Document Number:**
Effective Date:	**Version Number:** 00

Test ID #3.3: Cleaning In Place Performance check and SIP Validation	**Test Run: _**
Target:	The objective of this test is to verify the Cleaning in performance check within the chamber is adequate, as per system specification. The objective of this test is to verify that all locations within the chamber and in the condenser are exposed to the sterilization temperature during SIP cycle. The chamber and condenser attaining a temperature of 122°C during the sterilization hold (For 30 min.) period with steam pressure of 2.11 to 2.33 bar A. (This is considering the absolute pressure default value of 1.01 Bar) Temperature spread within the range of 122°C to 124.5°C during sterilization cycle will demonstrate the uniform heat distribution within the chamber. Any location(s) where the temperature sensor is placed, achieving minimum sterilization temperature throughout the sterilization hold period will be considered as cold spot.
Necessary materials:	• Calibrated Data logger • Calibrated T-type temperature sensor • Lyophilizer in Auto mode
Preconditions:	• Equipment should be normal operational mode • The chamber should be empty. • The temperature of the chamber should not be more than 20^0C from ambient. • Ensure that Steam quality tests performed and result complies as per specifications.

Test ID	**More than Test Description**
1	Before SIP validation study ensures that the lyophilizer is at ambient Temperature.
2	Take the calibrated data logger with minimum number of calibrated probes considering 5 probes for top and bottom shelf and 3 probes per shelf and one probe for the drain point.
3	Prepare at least 49 Nos. calibrated temperature mapping probe with location and channel tag.
4	Perform full loop calibration (probe + data logger) before starting the qualification runs. Attach calibration reports. If external agency is carrying out the test the calibration certificate will be referred.
5	Pass 49 nos..of Temperature mapping probe into chamber through the validation port of the Lyophilizer. Seal the port with silicone sealant so that steam leakage does not take place. Suspend the probes in the chamber in different position so that probes do not touch any metallic surface. Place all sensors, biological indicator and chemical indicator as per the mentioned **Drawing No 1 and Drawing No. 2 in Appendix 3.3.1**. Label the thermocouples by number using a strip of autoclavable tape, these ensure the location of the thermocouple for which the data is recorded. Suspended the probes along with the self contained biological indicators in the chamber in different position so that probes do not touch any metallic surface. Record the position of the probes and the biological indicators in a representative schematic form.
6	Keep one probe at drain point of lyophilizer chamber. The drain point is monitored because to identify the coolest point during the cycle.
7	Set the standard recipe for SIP cycle.
8	Record the parameter of recipe in the datasheet.
9	Start the data logger to record actual temperatures within the sterilization chamber with respect to time at a scan rate of 5 sec.

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10	Run the cycle as per the SOP and observe the temperature on SCADA and data logger.
11	When the SIP cycle completes; (1) Collect thermograph from the multipoint temperature recorder of the Lyophilizer and (2) Download the data from data logger into the computer for data-analysis and printing. Record the temperatures observed at different locations (3) remove and collect the exposed biological indicators and send them within a self-sealing sterile poly bag to microbiology laboratory for further studies with necessary identification.
12	Compare the lyophilizer report with the recipe feed.
13	Calculate Fo value of each temperature mapping location.
14	After the cycle is over visually check the chamber and condenser for the dryness.
15	Identify the coolest point and calculate the mathematical F0 value for the coolest point observed during the cycle as per the formula below. For calculation of F0 value the temperature for the cold point is to be recorded in the datasheet for each one-minute time interval at the hold time of sterilization. $$F0 = dt\sum 10^{\left[\frac{T-121}{Z}\right]}$$ F0 = dt ∑ (lethality rate) Where, dt = the time interval between successive temperature measurements (1 min.). T = the observed temperature at that particular time (As per the actual temperatures recorded) Z = the change in the heat resistance of Geobacillus Stearothermophilus spores as temperature is changed (10°C)
16	If the study is acceptable perform two more consecutive replicate runs to demonstrate cycle and sterilization-in-place reproducibility.
17	Compile the data generated during the qualification test for evaluation of the system.
18	Record the observations & data as per Appendix 3.3.1.
19	Attach the print out of the test cycle taken from the Lyophilizer with this data sheet.

	Acceptance criteria	**Acceptance criteria fulfilled? (Y/N)**
1.	**For Chamber and Condenser**	
1.1	Each external probe should achieve a minimum temperature of 122°C at sterile hold for NLT 30 minutes	
1.2	All inbuilt probes should achieve a minimum temperature of 122°C at sterile hold and run for the set time.	
1.3	No external probe should vary by more than 1° C from average of all external probe temperature during the sterilization hold time.	
1.4	The temperature spread at the sterilization hold time for each probe should not vary by more than 2°C.	
1.5	The external drain probe temperature should not vary by more than 2° C from the inbuilt drain probe temperature at the sterilization hold time.	

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1.6	The lag time should not more than 30 secs.	
1.7	The mathematical F0 value calculated for the coolest point should be more than the Biological F0 value for the indicators or 30 minutes.	
1.8	Chemical indicators at all locations should change the color from pink to green for at least three compartments.	
1.9	All BIs should show no growth after incubation of 55-60°C for 48 hours and 12 log reductions should be achieved.	
1.10	The report generated should be in similar sequence as per the recipe feed.	
1.11	The cycle should run in a similar sequence as per the recipe.	
1.12	The condenser and chamber should be visually dry enough.	
2.	**For In Line Air Filter**	
2.1	Visually inspect the Filters for drying.	
2.2	The minimum temperature at each location should be ≥ 122.0 °C during sterilization hold for NLT 30 minutes.	
2.3	The F0 Value for all the probes should not less than the biological Fo Value or 30 minutes, whichever is greater.	
2.4	Chemical indicators at all locations should change the color from pink to green for at least three compartments.	
2.5	All BIs should show no growth after incubation of 55-60°C for 48 hours and 12 log reductions should be achieved.	
3.	**For Thermocouples placed outside chamber and condenser in the pipelines.**	
3.1	The minimum temperature at each location should be ≥ 122 °C during sterilization. Hold period NLT 30 minutes.	
3.2	The F0 Value for all the probes should not less than the biological Fo Value or 30 Minutes, whichever is greater.	
3.3	Chemical indicators at all locations should change the color from pink to green for at Least three compartments.	
3.4	All BIs should show no growth after incubation of 55-60°C for 48 hours and 12 log Reduction to be achieved.	
Measures after test execution:	Allow all the sensors to cool to 65°C, before starting the next cycle.	

Comment Ref. No.	**Comment**	**Deviation Ref. No.**

Checked by (Signature/ Date)		**Verified by (Signature/Date)**	