POLICY ON RISK ASSESSMENT FOR SELECTION OF ENVIRONMENT MONITORING LOCATION

INTRODUCTION:
To provide guidance for Risk Assessment for selection of Environmental Monitoring locations and evaluation of sampling sites in Aseptic Facilities based on aseptic activity, interventions and available controls in place.

SCOPE:
This Policy is applicable to Facilities responsible for sterile and aseptic processing where;

- New facility is designed and / or new equipment is included at individual facility,
- Modifications made to existing facility

POLICY DETAILS:
1.0 Risk Based Environmental Monitoring:

Environmental Monitoring program detects the microbiological changing trends of microbial counts and microflora growth within cleanroom or controlled environments. The results obtained provide information about the physical construction of the room, the performance of the Heating, Ventilation, and Air- Conditioning (HVAC) system, personnel cleanliness, gowning practices, the equipment, and cleaning operations.

Risk based approaches are recommended in USP, ISO and PDA guidelines. Risk based assessment is premeditated considering the risk to the product preventing the generation of erroneous data and microbial proliferation in production environments, to determine locations for environment monitoring to evaluate and understand the bio-burden (flora) of the product processing areas.

2.0 Sample Site Selection:

Sample site selection depends on the clean room design and manufacturing process. These factors help in evaluation of the potential risks of microbial contamination associated with aseptic areas and support areas of the manufacturing facility and to ensure the sterility assurance program. To ensure effectiveness of microbial controls used for the manufacture of sterile pharmaceutical products a risk based viable monitoring program shall be designed as per current regulatory requirements using the following considerations and requirements.

- Sites or processes in which microbial contamination would most likely have an adverse effect on product quality.

- Sites that would most likely demonstrate the heaviest microbial proliferation during actual production such as high traffic areas, foot borne contamination. Sites that represent the most inaccessible or difficult areas to clean and disinfect.
- Site selection based on the airflow visualization studies performed for Grade A environment.
- Sites near opened filled containers, opened closures etc.
- Based on the proximity to the work area and ensuring covering of all zones.
- Surface monitoring locations for the rooms are selected based on the

operator contact e.g. door handles, surface of HMI etc.

- Surface monitoring of equipment's locations such as filling line control panels, stopper bowls, filling needles are selected post filling to monitor the effect of microbial contamination on the product quality.

The risk-based microbiological assessment shall be performed to establish a viable monitoring program which will provide meaningful data that is specific to the process and demonstrate that the facility performs within control.

The purpose of this microbiological risk assessment is also to consistently provide the following:

- Identification of trends
- Effectiveness of disinfectant and cleaning program
- Performance of the HVAC system
- Effective controls for personnel hygiene and gowning
- Monitoring of the flow of people, parts, equipment, and materials
- Impact of equipment on the clean room environment
- Timely detection of potential problems

3.0 Contamination Risk Categories:

An important component of the risk assessment approach is to evaluate a risk by using a scientific rationale approach that can be used to quantify the risk of contamination and design the environmental monitoring program in the cleanrooms based on risk categorization. Based on the probability of contamination occurrence, the risk is divided in three categories:

- **High Risk:** The areas with a high risk are those where the product/sterilized & ready to use primary packing material are exposed to the environment.

- **Medium Risk:** The area adjacent to the high-risk zone which can inadvertently have adverse effect on the product quality.

- **Low Risk:** The support area to the aseptic processing area which do not have direct impact on the product quality with respect to the viable contamination.

3.1 For new sterile facilities or whenever required, a risk based evaluation of environmental monitoring for selection of sampling locations shall be performed. Refer Table 1 for 'Risk Parameters and Classes'.

POLICY ON RISK ASSESSMENT FOR SELECTION OF ENVIRONMENT MONITORING LOCATION

Table 1: Risk Parameters and Classes

Risk Parameters	Risk Classes				
	High Risk (H)			Medium Risk (M)	Low Risk (L)
Area Type	E.g. Filling Grade A	Cabinet	–	E.g. Sterile corridor – Grade B, Filtration Room – Grade B, Cooling zone – Grade B, Filling room – Grade B, Filling – Lyophilisation-loading – Grade B, Vial sealing – Grade A (Background Grade B)	E.g. Change room – Grade D, Change room – Grade C, Change room – Grade B, Buffer Air- lock – Grade B, Return Change room – Grade C.
Process Factors	Sterile Item	Material	/	Material used before filtration / sterilization	Non-Sterile Material / Item
No. of Personnel's Working	8 or more			3 - 7	1 - 2
Duration of Stay in Area	> 6 hrs			1 – 6 hrs	< 1 hr

3.2 To determine the Risk Class of respective room / area, refer Table 1 and tabulate the details as follows:

a) Name of Room
b) Area name
c) Risk Parameter
   - Area Type
   - Process Factors
   - No. of Personnels working
   - Duration of stay in area
   - Additional parameters can be added such as Type of Interventions and Process Design
d) Size of Area (m^2)
e) Risk Class
f) No. of Sampling Locations
g) Justification

Note: Risk to be addressed as H / M / L for Risk Parameters and Risk Class.

3.3 Number of sampling locations in a room / area shall be based on the risk determined. Refer below Table 2 for guidance.

POLICY ON RISK ASSESSMENT FOR SELECTION OF ENVIRONMENT MONITORING LOCATION

Table 2: Risk Classes and No. of Sampling Locations

Risk Classes	No. of Sampling Locations in Area / Room*
High Risk (H)	5
Medium Risk (M)	2
Low Risk (L)	1

**No. of locations can be modified based on the area size and other additional risks with proper justification.*

3.4 Following aspects shall be considered for risk-based evaluation of the environmental monitoring sampling location;

a) Proximity of sample location w.r.t source of contamination
b) No. of personnel working in Clean room
c) Duration of stay in room/area
d) Process / operation
e) Material flow

When establishing an environmental control programme, the frequency of monitoring different controlled areas to be determined based on criticality factors relevant to each specific area.

As per above criteria, each sampling location shall be evaluated for risk associated with the operation and based on risk index sampling locations shall be finalised for routine microbiological environmental monitoring.

AMENDMENT AND WAIVER:
The company reserves right to amend, alter and/or terminate this policy at any time.

DEFINITION: Not Applicable

ABBREVIATIONS: Not Applicable

REFERENCES: Not Applicable