RISK ANALYSIS STUDY PROTOCOL CUM REPORT FOR CONTAINERS USED IN MANUFACTURING AREA

DATE OF RISK ANALYSIS	
SUPERSEDE PROTOCOL CUM REPORT No.	**NIL**

Risk Analysis Study Protocol cum Report for Containers used in Manufacturing area

PROTOCOL CONTENTS

Risk Analysis Study Protocol cum Report for Containers used in Manufacturing area

1.0 PROTOCOL CUM REPORT APPROVAL:

PREPARED BY:

DESIGNATION	NAME	SIGNATURE	DATE
OFFICER/EXECUTIVE (QUALITY ASSURANCE)			

REVIEWED BY:

DESIGNATION	NAME	SIGNATURE	DATE
HEAD (PRODUCTION)			

APPROVED BY:

DESIGNATION	NAME	SIGNATURE	DATE
HEAD (QUALITY ASSURANCE)			

Risk Analysis Study Protocol cum Report for Containers used in Manufacturing area

2.0 OBJECTIVE:

- To provide documented evidence that there is no risk in using different containers (Blue HDPE containers/Grey HDPE containers & SS Lifting containers for Compression) in manufacturing area (Granulation/Compression/Coating & Packing).

3.0 SCOPE:

- This risk analysis study Protocol is applicable for performing risk analysis study using different containers (Blue HDPE containers/Grey HDPE containers & SS Lifting containers for Compression) in manufacturing area (Granulation/Compression/Coating & Packing).

4.0 RESPONSIBILITY:

Department	Responsibility
Quality Assurance	• Shall prepare & Review the Risk analysis Protocol. • Execution of the Risk analysis Protocol with Production and Quality Control. • Shall compile the data & Prepare Summary Report • Risk analysis Protocol shall be approved by the QA prior the execution. • Shall review the executed Protocol to check the compliance and corrective action for any discrepancies found. Also shall prepare the summary and conclusion of the Risk analysis Study.
Production	• Reviewing of Risk analysis Protocol for Correctness, Completeness and Technical Excellence. • To provide support for execution of Risk analysis Study as per Protocol. • Post approval of Risk analysis Protocol after execution.

5.0 REASON FOR RISK ANALYSIS:

- To evaluate the risk in using different containers (Blue HDPE containers/Grey HDPE containers & SS Lifting containers for Compression) in manufacturing area (Granulation/Compression/Coating & Packing).

6.0 SITE OF STUDY:

G-block manufacturing area (Granulation/Compression/Coating and Packing) floor, manufacturing area (Granulation/Compression/Coating and Packing) at…….

7.0 RISK COMMUNICATION & TRAINING:

- The Risk analysis team shall be authorized by Head-QA or his/her designee.
- Quality Risk Management Team shall be cross functional team comprised of expert from different areas such as QA and Production.
- Training shall be imparted to the team members before execution of Protocol for proper understanding of the procedure. Training shall be recorded in Training attendance Record.

Risk Analysis Study Protocol cum Report for Containers used in Manufacturing area

7.1 TRAINING OF EXECUTION TEAM:

S.No.	Name of Trainee	Department	Designation	Signature of Trainee	Checked by QA (Sign & Date)
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

Name of the Trainer: _____

Inference:

_____

_____

_____

_____

_____

_____

Reviewed By_____
Manager QA
(Sign & Date)

Risk Analysis Study Protocol cum Report for Containers used in Manufacturing area

8.0 RISK IDENTIFICATION & EVALUATION:

- There are 03 types of containers used in manufacturing area of Granulation, Compression, Coating & Packing in ……..

- **Detail given below:**

S.No.	Type of Containers	Make	Used for
1.	**Blue Containers**	**High Density Polyethylene**	• **Storage of Granules**
2.	**Grey Containers**	**High Density Polyethylene**	• **Storage of Uncoated tablets** • **Storage of Coated tablets** • **Storage of Hardgel Capsules** • **Storage of Softgel Capsules**
3.	**In-process Containers**	**Stainless Steel 316L**	• **Storage of Granules**

- Although double polybags are used in HDPE containers but there may be a change of contamination during storage of granules & tablets.
- **Contamination may be due to the following reasons:**
  1. Contamination due to previous product residue.
  2. Contamination of Cleaning agent residue.
  3. Contamination from Nylon brush or Nylon scrubber.
  4. Contamination from dust or particles settled during storage.

Evaluation: Although there is very less chance of contamination & cross-contamination but if happens, may lead to serious issues:

- Product may deteriorate.
- Any remains of previous product may leads to intermixing.
- Contaminants may got intermixed during compression, coating & packing.

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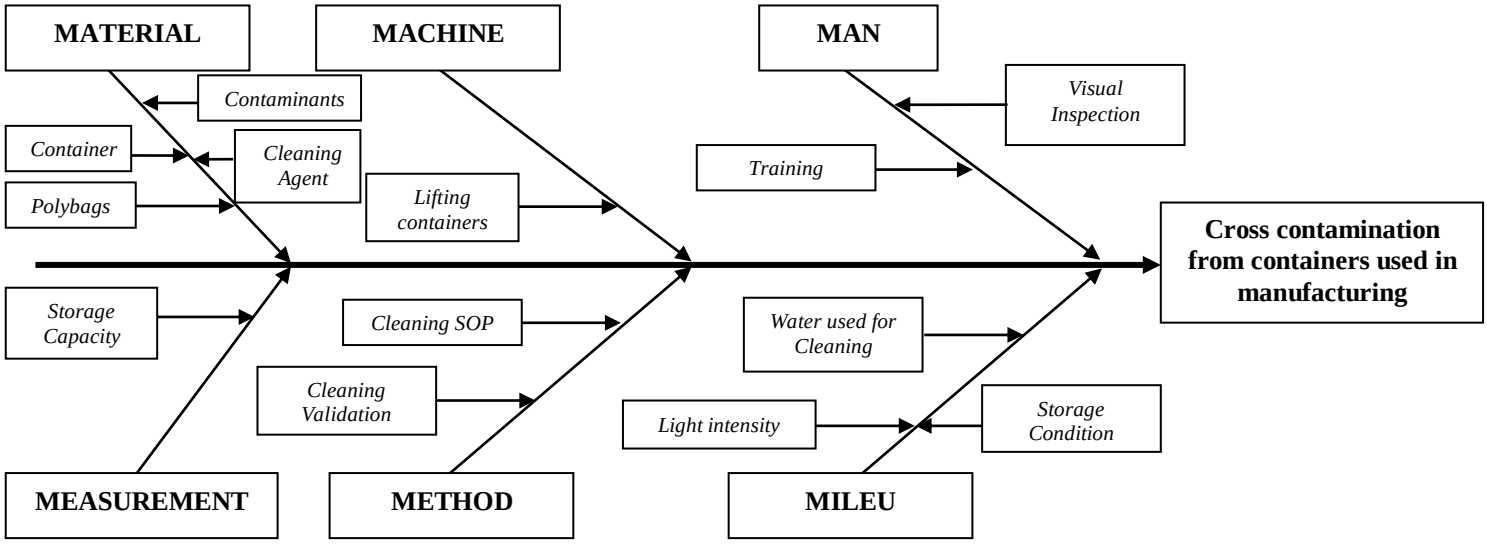
9.0 RISK MITIGATION:

- Visual inspection.
- Use of double polybags.
- Use of tie.
- Avoid re-cycle containers.
- Cleaning validation.

10.0 RISK ANALYSIS TOOLS, RE-RISK ANALYSISCRITERIA:

10.1 Fish bone:



Fish bone tool used for risk assessment, area of concern are:

1. **Mileu** : Environment seems have an indirect impact on containers, storage condition shall be appropriate within acceptance criteria, water used for cleaning containers shall be passed in all criteria, further light intensity should be appropriate for visual inspection.

2. **Method** : Cleaning method is having direct impact on contamination through containers, method should be Validated for the worst case identified.

3. **Measurement** : Storage capacity for container usage is fixed i.e. NMT 25 kg for Blue HDPE (Capacity: 50 kg) containers & NMT 15 kg for Grey HDPE containers (Capacity: 25 kg).

4. **Man** : Persons doing cleaning & line clearance shall be trained in their respective jobs.

5. **Machine** : Lifting containers of SS316L are considered as equipment & their cleaning procedure shall be validated through cleaning validation as they are the contact parts.

6. **Material** : Contaminants such as lint cloth fibers, nylon brush fibers, polybags, previous product residues & cleaning agents resides are verified during the line clearance for the contamination.

10.2 Failure Mode Effect Analysis:

In the following section a table is produced for the risk analysis using FMEA tool. The significance or instruction for each column is described in the following paragraph.

Column 1:	**Serial number** of Risk Analysis item
Column 2:	**Item/Function:** Identify the process step or component associated with the risk.
Column 3:	**Potential Failure Mode:** Identify the type of risk associated with the process or component.
Column 4:	**Effect of Potential Failure/Cause:** Verify that whether risk have **GMP impact.**
Column 5/6/7/8/9:	**Severity/Occurrence/Detection/Risk level/Risk Acceptance:** Risk Priority Number to be calculated by taking Severity, Occurrence & Detection of potential failure into consideration.
Column 10:	**Risk Mitigation**: Write the risk mitigation strategy as considered in design.
Column 11/12/13/14/15:	**Severity/Occurrence/Detection/Risk level/Risk Acceptance:** Risk Priority Number to be calculated after mitigation by taking Severity, Occurrence & Detection of potential failure into consideration.
Column16:	**Recommended action:** Recommended actions should be given for controlling failure occurrence.

Table 1: Instruction for each column given above

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Risk Analysis Study Protocol cum Report for Containers used in Manufacturing area

QRA No.: QRA/H/18/0002

Procedure: Risk in using of storage containers during manufacturing stages	**Quality Risk Assessment Date:**

S.No.	Item/ Function	Potential Failure Mode (Failure Mode)	Potential Cause/ Mechanism of Failure	Potential Effect of Failure (Effect)	Current Control	Reference	S	O	D	Risk Priority Number (S*O*D)	Recommended Actions (if any)	Post Risk Evaluation			
												S	O	D	RPN S*O*D
1.	**Blue Containers used for storage**	Cleaning not proper	• Tags, Stickers & Labels of previous product.	• May lead to contamination	• Line Clearance as per BMR/BPR.	• BMR/BPR	3	3	1	9	NA	NA	NA	NA	NA
			• Remains of tie used for knotting the bags	• Broken ties may leads to contamination in next batch	• Line Clearance as per BMR/BPR.	• BMR/BPR	4	3	1	12	NA	NA	NA	NA	NA
			• Torned polybags	• Product may come in direct contact of container	• Double polybags used for storage	• BM/BPR	3	3	2	18	NA	NA	NA	NA	NA
					• Cleaning of containers done after usage	• SOP "Cleaning of Containers"	3	3	2	18	NA	NA	NA	NA	NA
			• Deposition of dust & particles accumulated during storage.	• Product deterioration	• Double polybags used for storage	• BMR/BPR	3	2	4	24	NA	NA	NA	NA	NA
				• Failure of product description	• Cleaning of containers done after usage	• SOP "Cleaning of Containers"	4	2	4	24	NA	NA	NA	NA	NA
			• Damaged containers	• Sharp edges resulting into product spillage	• Verification of containers during line clearance	• SOP "Labeling of Equipment & Containers"	3	2	1	6	NA	NA	NA	NA	NA
					• Double polybags used for storage	• BMR/BPR	3	2	1	6	NA	NA	NA	NA	NA
			• Drying not proper	• After cleaning with purified water, improper drying may leads to moisture absorption.	• Containers are kept in upside down position on pallets.	• SOP "Cleaning of Containers"	3	3	2	18	NA	NA	NA	NA	NA
			• Remains of previous product	• Any remains of previous product (Granules/Tablets) may leads to cross contamination	• Drums are verified visually for any contamination.	• SOP "Labeling of Equipment & Containers"	4	2	3	24	NA	NA	NA	NA	NA
			• Residue of previous product	• Remains of residues of previous product.	• Cleaning validation	• "Cleaning Validation Protocol for Dispensing tools & Equipment Accessories"	4	2	5	40	Cleaning Validation to be done	4	2	1	8
			• Cleaning agent residue	• Remains of residues of Cleaning agent.	• Cleaning Validation for cleaning agent	• "Cleaning Validation Protocol for Dispensing tools & Equipment Accessories"	4	2	5	40	Cleaning Validation to be done	4	2	1	8

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S.No.	Item/ Function	Potential Failure Mode (Failure Mode)	Potential Cause/ Mechanism of Failure	Potential Effect of Failure (Effect)	Current Control	Reference	S	O	D	Risk Priority Number (S*O*D)	Recommended Actions (if any)	Post Risk Evaluation			
												S	O	D	RPN S*O*D
			• Remains of nylon brush, lint free cloth & scrubber used for cleaning.	• Cross contamination in next batch.	• Visual inspection after drying.	• SOP "Cleaning of Containers"	4	2	3	24	NA	NA	NA	NA	NA
			• Overweight containers	• Broken & crushed tablets may leads to powder formation which might result in cross contamination.	• Storage capacities of containers are freezed (NMT 25 kg).	• BMR/BPR	3	4	1	12	NA	NA	NA	NA	NA
2.	**Grey Containers used for storage**	Cleaning not proper	• Tags, Stickers & Labels of previous product.	• May lead to contamination	• Line Clearance as per BMR/BPR.	• BMR/BPR	3	3	1	9	NA	NA	NA	NA	NA
			• Remains of tie used for knotting the bags	• Broken ties may leads to contamination in next batch	• Line Clearance as per BMR/BPR.	• BMR/BPR	4	3	1	12	NA	NA	NA	NA	NA
			• Torned polybags	• Product may come in direct contact of container	• Double polybags used for storage	• BMR/BPR	3	3	2	18	NA	NA	NA	NA	NA
			• Deposition of dust & particles accumulated during storage.	• Product deterioration	• Double polybags used for storage	• BMR/BPR	3	2	4	24	NA	NA	NA	NA	NA
				• Failure of product description	• Cleaning of containers done after usage	• SOP "Cleaning of Containers"	4	2	3	24	NA	NA	NA	NA	NA
			• Damaged containers	• Sharp edges resulting into product spillage	• Verification of containers during line clearance	• SOP "Cleaning of Containers"	3	2	4	24	NA	NA	NA	NA	NA
					• Double polybags used for storage	• BMR/BPR	3	2	4	24	NA	NA	NA	NA	NA
			• Drying not proper	• After cleaning with purified water, improper drying may leads to moisture absorption.	• Containers are kept in upside down position on pallets.	• SOP "Cleaning of Containers"	3	3	2	18	NA	NA	NA	NA	NA
			• Remains of previous product	• Any remains of previous product (Granules/Tablets) may leads to cross contamination	• Drums are verified visually for any contamination.	• SOP "Labeling of Equipment & Containers"	4	2	3	24	NA	NA	NA	NA	NA
			• Residue of previous product	• Remains of residues of previous product.	• Cleaning validation	• "Cleaning Validation Protocol for Dispensing tools & Equipment Accessories"	4	2	5	40	Cleaning Validation to be done	4	2	1	8

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Risk Analysis Study Protocol cum Report for Containers used in Manufacturing area

S.No.	Item/ Function	Potential Failure Mode (Failure Mode)	Potential Cause/ Mechanism of Failure	Potential Effect of Failure (Effect)	Current Control	Reference	S	O	D	Risk Priority Number (S*O*D)	Recommended Actions (if any)	Post Risk Evaluation			
												S	O	D	RPN S*O*D
			• Cleaning agent residue	•Remains of residues of Cleaning agent.	•Cleaning Validation cleaning agent	• "Cleaning Validation Protocol for Dispensing tools & Equipment Accessories"	4	2	5	40	Cleaning Validation to be done	4	2	1	8
			• Remaining of nylon brush & scrubber used for cleaning	• Cross contamination in next batch.	•Visual inspection after drying.	• SOP "Labeling of Equipment & Containers"	4	2	3	24	NA	NA	NA	NA	NA
			• Overweight Containers	•Broken & crushed tablets may leads to powder formation which might result in cross contamination.	•Storage capacities of containers are freezed (NMT 25 kg).	• BMR/BPR	3	4	1	12	NA	NA	NA	NA	NA
3.	**SS Lifting containers for transferring of granules to hopper**	Cleaning not proper	• Tags, Stickers & Labels of previous product.	• May lead to contamination	•Line Clearance as per BMR/BPR.	• BMR/BPR	3	3	1	9	NA	NA	NA	NA	NA
			• Deposition of dust & particles accumulated during storage.	•Product deterioration	•Cleaning of containers done after usage	• SOP for "Cleaning of Containers"	3	2	4	24	NA	NA	NA	NA	NA
				•Failure of product description		• SOP "Cleaning of Containers"	4	2	3	32	NA	NA	NA	NA	NA
			• Drying not proper	•After cleaning with purified water, improper drying may leads to moisture absorption.	•Containers are kept in upside down position on pallets.	• SOP "Cleaning of Containers"	3	3	2	18	NA	NA	NA	NA	NA
			• Remains of previous product	•Any remains of previous product (Granules/Tablets) may leads to cross contamination	•Drums are verified visually for any contamination.	• SOP "Labeling of Equipment & Containers"	4	2	3	24	NA	NA	NA	NA	NA
			• Residue of previous product	•Remains of residues of previous product.	•Cleaning validation	• "Cleaning Validation Protocol for Dispensing tools & Equipment Accessories"	4	2	5	40	Cleaning Validation to be done	4	2	1	8
			• Cleaning agent residue	•Remains of residues of Cleaning agent.	•Cleaning Validation performed. for cleaning agent	• "Cleaning Validation Protocol for Dispensing tools & Equipment Accessories"	4	2	5	40	Cleaning Validation to be done	4	2	1	8
			• Over filled containers	• May leads to spillage	•Visual inspection.	• SOP "Labeling of Equipment & Containers"	3	3	1	9	NA	NA	NA	NA	NA

Table 2: The above table shows Potential failure mode, effect of potential failure along with Risk Probable Number, Risk Mitigation & Recommended Actions.

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***The Risk Priority Number (RPN/Overall Risk) changes based upon the risk. The Risk Assessment team shall decide the acceptance criteria. For example the risk priority number is categorized as below:**

Risk Priority Number (RPN)	Risk levels
Upto 25	Low
26-50	Medium
51 to ≤ 125	High

RPN = Severity x Occurrence x Detection

Remark if any:

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

QUALITY RISK ASSESSEMENT AND MITIGATION SUMMARY REPORT

Name of Facility			
S.No.	Recommended Action	Responsible Person	Target Date of Completion
1.	Cleaning Validation to be performed		

Verification of Action Plan:

All the above agreed actions completed, Not Completed.

(*incase any recommendations Not completed, to be tracked through CAPA System)

Remark if any:

……

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Verified By
(QA)
Sign & Date……..

Reviewed By:
(Manager QA)
Sign & Date……..

11.0 CONCLUSION:

Risk analysis data shall be written on Risk Analysis Study Protocol cum Report for using different type of containers in manufacturing area in different stages of manufacturing, clearly stating the achievement or non-compliance of the acceptance criteria, effect of the deviations made during the Risk analysis and in case of failure, investigation carried out and their findings.

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12.0 RECOMMENDATION:

Recommendation shall be written on the Risk Analysis Study Protocol cum Report for using different type of containers in manufacturing area in different stages of manufacturing, clearly stating that there is no impact/adverse impact on the product quality& personnel.

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13.0 REFERENCES:

SOP **"Quality Risk Management".**

14.0 DOCUMENTS TO BE ATTACHED:

- Reference SOP.

15.0 DEVIATION FROM PRE DEFINED SPECIFICATION, IF ANY:

Deviations from pre-defined procedures & specification during use of containers for manufacturing shall be investigated in accordance with QA SOP **"Handling of Deviations"**, and shall be documented in the Risk analysis Protocol cum report.

16.0 CHANGE CONTROL, IF ANY:

Change control during use of containers for manufacturing shall be authorized in accordance with QA SOP **"Change Management"**, and shall be documented in the Risk analysis Protocol cum report.

17.0 ABBREVIATIONS:

FMEA : Failure Mode Effect Analysis
GMP : Good Manufacturing Practices
RPN : Risk Priority Number

18.0 PROTOCOL CUM REPORT POST APPROVAL:

PREPARED BY:

DESIGNATION	NAME	SIGNATURE	DATE
OFFICER/EXECUTIVE QUALITY ASSURANCE)			

REVIEWED BY:

DESIGNATION	NAME	SIGNATURE	DATE
HEAD (PRODUCTION)			

APPROVED BY:

DESIGNATION	NAME	SIGNATURE	DATE
HEAD (QUALITY ASSURANCE)			

Risk Analysis Study Protocol cum Report for Containers used in Manufacturing area

ANNEXURE I

LIST OF SS CONTAINERS

S.NO.	EQUIPMENT	MAKE	CAPACITY	EQUIPMENT ID No.
1.	S S bin	Shefa Industries	300 Ltr.	
2.	S S bin	Shefa Industries	300 Ltr.	
3.	S S bin	Shefa Industries	300 Ltr.	
4.	S S bin	Shefa Industries	300 Ltr.	
5.	S S bin	Shefa Industries	300 Ltr.	
6.	S S bin	Shefa Industries	300 Ltr.	
7.	S S bin	Shefa Industries	300 Ltr.	
8.	S S bin	Shefa Industries	300 Ltr.	
9.	S S bin	Shefa Industries	300 Ltr.	
10.	S S bin	Shefa Industries	300 Ltr.	
11.	S S bin	Shefa Industries	300 Ltr.	
12.	S S bin	Shefa Industries	300 Ltr.	
13.	S S bin	Shefa Industries	300 Ltr.	
14.	S S bin	Shefa Industries	300 Ltr.	
15.	S S bin	Shefa Industries	300 Ltr.	
16.	S S bin	Shefa Industries	300 Ltr.	
17.	S S bin	Shefa Industries	300 Ltr.	
18.	S S bin	Shefa Industries	300 Ltr.	
19.	S S bin	Shefa Industries	300 Ltr.	
20.	S S bin	Shefa Industries	300 Ltr.	
21.	S S bin	Shefa Industries	300 Ltr.	
22.	S S bin	Shefa Industries	300 Ltr.	
23.	S S bin	Shefa Industries	300 Ltr.	
24.	S S bin	Shefa Industries	300 Ltr.	
25.	S S bin	Shefa Industries	300 Ltr.	
26.	S S bin	Shefa Industries	300 Ltr.	
27.	S S bin	Shefa Industries	300 Ltr.	
28.	S S bin	Shefa Industries	300 Ltr.	
29.	S S bin	Shefa Industries	300 Ltr.	
30.	S S bin	Shefa Industries	300 Ltr.	