PROCESS VALIDATION PROTOCOL

FOR

LIDOCAINE INJECTION BP 2% w/v

20 ML (DRY POWDER INJECTION)

PROCESS VALIDATION PROTOCOL FOR LIDOCAINE INJECTION BP 2% w/v, 20 ml

PROTOCOL CONTENTS

1.0 PROTOCOL APPROVAL:

PREPARED BY:

DESIGNATION	NAME	SIGNATURE	DATE
OFFICER/EXECUTIVE (QUALITY ASSURANCE)			

REVIEWED BY:

DESIGNATION	NAME	SIGNATURE	DATE
EXECUTIVE/MANAGER (QUALITY ASSURANCE)			
HEAD (QUALITY CONTROL)			
HEAD (MICROBIOLOGY)			
HEAD (PRODUCTION)			
HEAD (ENGINEERING)			

APPROVED BY:

DESIGNATION	NAME	SIGNATURE	DATE
HEAD (QUALITY ASSURANCE)			

2.0 OBJECTIVE:

- The objective of this protocol is to validate the manufacturing process of Lidocaine Injection BP 2% w/v (20 ml) using qualified facilities, equipment & utilities by evaluating the consecutive batches being manufactured at the Liquid Vial Line.
- This study shall be conducted for the generation of sufficient data to establish documentary evidence that the manufacturing process including dispensing, CIP/SIP, bulk preparing, filtration, filling, sealing, visual inspection and packing process is suitable and appropriate for its intended purpose and validated process shall consistently meet the predefined specifications and quality attributes of the finished product.

3.0 SCOPE

- The scope of this protocol is to validate the manufacturing process of Lidocaine Injection BP 2% w/v (20 ml) Liquid Vial manufactured at Liquid Vials Line.

4.0 RESPONSIBILITY:

DEPARTMENT	RESPONSIBILITIES
Quality Assurance	1. Responsible to prepare, review and approve process validation protocol and report. 2. To co-ordinate with cross functional teams to support the process validation execution and also responsible to monitor the execution of process validation. 3. Ensure that the facility/equipment's/instruments and utilities conform to the validated/calibrated state prior to the execution of process validation. 4. To review the trends/statistical evaluation for Critical Process Parameters (CPP) / Critical Quality Attributes (CQA) for every product manufactured at the site.
IPQA	1. To perform Process validation sampling as per sampling plan and submit them to Quality Control Department. 2. To monitor, verify and record critical process attributes. 3. To record and report any deviation either planned or unplanned happened during batch manufacturing.
QC	1. Responsible to review process validation protocol and report. 2. To analyze the samples as per sampling plan during process validation and to

DEPARTMENT	RESPONSIBILITIES
	maintain the records of the test results followed by the reporting of the results. 3. Review of analytical data & submission of analytical results to QA.
Microbiology	1. Responsible to review process validation protocol and report. 2. Responsible to collect sample as per process validation protocol. 3. To analyze the samples as per sampling plan during process validation and to maintain the records of the test results followed by the reporting of the results. 4. Review & submission of results to QA.
Production	1. Responsible to review process validation protocol and report. 2. Ensure that the current effective version of SOP's, Batch Records etc. are implemented and Concerned Personnel are trained. 3. Prior to execution of process validation batch to ensure that facility / equipment / instruments & utilities are in validated / calibrated state. 4. Execution of process validation and collection of routine in-process samples as defined in the batch manufacturing record.

5.0 VALIDATION APPROACH:

Validation shall be carried out in three consecutive batches with prospective approach as new product is introduced to the facility. Study shall be carried out in two phases

- Review of documents.
- Manufacturing of batches.

Review of documents shall include:

- Standard Operating and cleaning Procedures & Qualification and Validation status of equipment and system.
- Manufacturing Process & BMR.
- Standard Testing Procedure.
- Raw material, packing material, in-process, finished product specifications.

6.0 REASON FOR VALIDATION:

- New Product manufactured at Liquid Vial Line.

7.0 REASON FOR REVALIDATION:

- Any major change in the manufacturing process which may affect the quality of the product.
- Any change in the batch size.
- Any change in the batch formula.
- Change in manufacturing site.
- Any modification in any critical equipment.
- Any major modification in the related utility system.
- Any change in the specification and/or change in the source of active pharmaceutical ingredient (API).

8.0 PRE-REQUISITE:

8.1 TRAINING DETAILS:

- The validation team shall be approved by Head-QA
- All the personnel involved in the manufacturing and Packing of Validation Batches, Sampling and Testing of Validation Samples should be appropriately trained both in their job related activities and on the process validation protocol by Head-QA.

8.2 PRODUCT INFORMATION:

GENERIC NAME	**:**	Lidocaine Injection BP 2 % with preservative
LABEL CLAIM	**:**	**Each ml contains:** Lidocaine Hydrochloride Monohydrate Ph. Eur….. 20 mg Methyl Hydroxybenzoate BP……... 2 mg (As Preservative) Water for Injections BP……..…... q. s.
PACK SIZE	**:**	Clear Glass Molded Vial 20 ml (USP Type – I)
BATCH SIZE	**:**	250 L / 11904 Nos.
MANUFACTURING LICENSE No.:		……..
PROPOSED SHELF LIFE	**:**	36 Months
MARKET	**:**	Export
DOSAGE FORM	**:**	Liquid Injection
DESCRIPTION	**:**	A Clear, Colorless solution filled in clear glass molded vial 20 ml plugged with 20 mm Bromo butyl rubber stopper and sealed with 20 mm White flip off aluminum seal.
STORAGE CONDITION	**:**	Store at a temperature not exceeding 25ºC.

MANUFACTURING LOCATION:

8.3 ENVIRONMENT MONITORING:

All environment parameters of critical area as listed shall be verified during execution of the process validation study.

- Passive air sampling/Settle plate monitoring
- Active air sampling/Volumetric air sampling
- Surface monitoring
- Personnel monitoring
- Non-viable particle monitoring
- Pressure differential monitoring
- Temperature & Relative humidity monitoring

8.4 MANUFACTURING PROCESS INSTRUCTIONS:

- **Manufacturing process**: Sequential steps in manufacturing process shall be followed as per the approved current BMR. Process parameters during each unit operation shall be monitored to demonstrate that product meets the acceptance criteria.
- **Raw material**: Raw materials to be used in the manufacturing shall be procured from the approved vendor and shall meet all the specifications in the analysis prior to use. All the raw materials shall have valid certification from quality control lab before use for manufacturing. Containers used in the dispensing of raw materials should be clean and dry. After dispensing of API, it should be stored in air tight container.
- **Primary Packing Materials**: Primary packing materials being used in the manufacturing shall be procured from the approved vendor and shall meet the laid down specification in the analysis prior to use.
- **Secondary & Tertiary Packing Material:** Secondary and Tertiary packing materials being used in the packaging process shall be procured from the approved vendor and shall meet the laid down specification in the analysis prior to use.
- **Bulk Preparing:** Temperature of bulk solution is to be maintained during entire batch manufacturing process. Bulk solution hold in SS 316 L mixing vessel should not exceed 12` hours before filtration and filtered bulk solution hold in SS 316 L holding vessel should not exceed 24 hours before final filtration.
- **Filtration**: Pre-integrity test of 0.2 µ filter shall be done with water and post-integrity test of 0.2 µ filter shall be done with drug product at 20°C to 25°C. Bulk solution filtration and filling should not exceed 24 hours.

- Visual inspection of vials for any defect like glass particles, black particles, sealing defects, empty vials, low fill, over fill etc. shall be performed after capping.

8.5 MANUFACTURING FORMULA:

RAW MATERIALS:

S.No.	Material Code	Ingredients	Specifications	Manufacturer Name	Label Claim	Theoretical Quantity (For 250 L)	Unit
1.		Lidocaine Hydrochloride Monohydrate	Ph. Eur.		20 mg/ml	5.051*	Kg.
2.		Methyl Hydroxybenzoate	BP		2 mg/ml	0.510**	Kg.
3.		Sodium chloride	BP		--	1.125	Kg.
4.		Sodium Hydroxide	BP		--	0.125#	Kg.
5.		Water for Injection	BP		--	q.s.	Ltr.

Remark 1: *Material has been calculated with considering the assay NLT 99.0%.
Remark 2: **Material has been calculated with considering the assay NLT 98.0%.
Remark 3: # This qty. used for pH adjustment only.

PRIMARY PACKING MATERIALS:

S. No.	Material Code	Name of Material	Manufacturer Name	Function	Theoretical Quantity (For 250 L / 11904 No's)	Unit
1.		Clear Glass Molded Vials 20 ml (USP Type -1)		Primary Packing Material	11904	Nos.
2.		Rubber Plug 20 mm Bromo butyl		Primary Packing Material	11904	Nos.
3.		Aluminum Seal Flip-off 20 mm white		Primary Packing Material	12142*	Nos.

Remark: *Take 2% excess quantity of material to compensate processing loss.

8.6 BATCH DETAILS:

Batch No	Manufacturing Date	Expiry Date	Shelf Life	Standard Batch Size
			36 months	
			36 months	
			36 months	

Batch details such as batch number, manufacturing date and expiry date shall be recorded during protocol execution.
$ Shelf life is provisional and shall be ascertained based on real time stability data.

8.7 EQUIPMENT QUALIFICATION VERIFICATION:

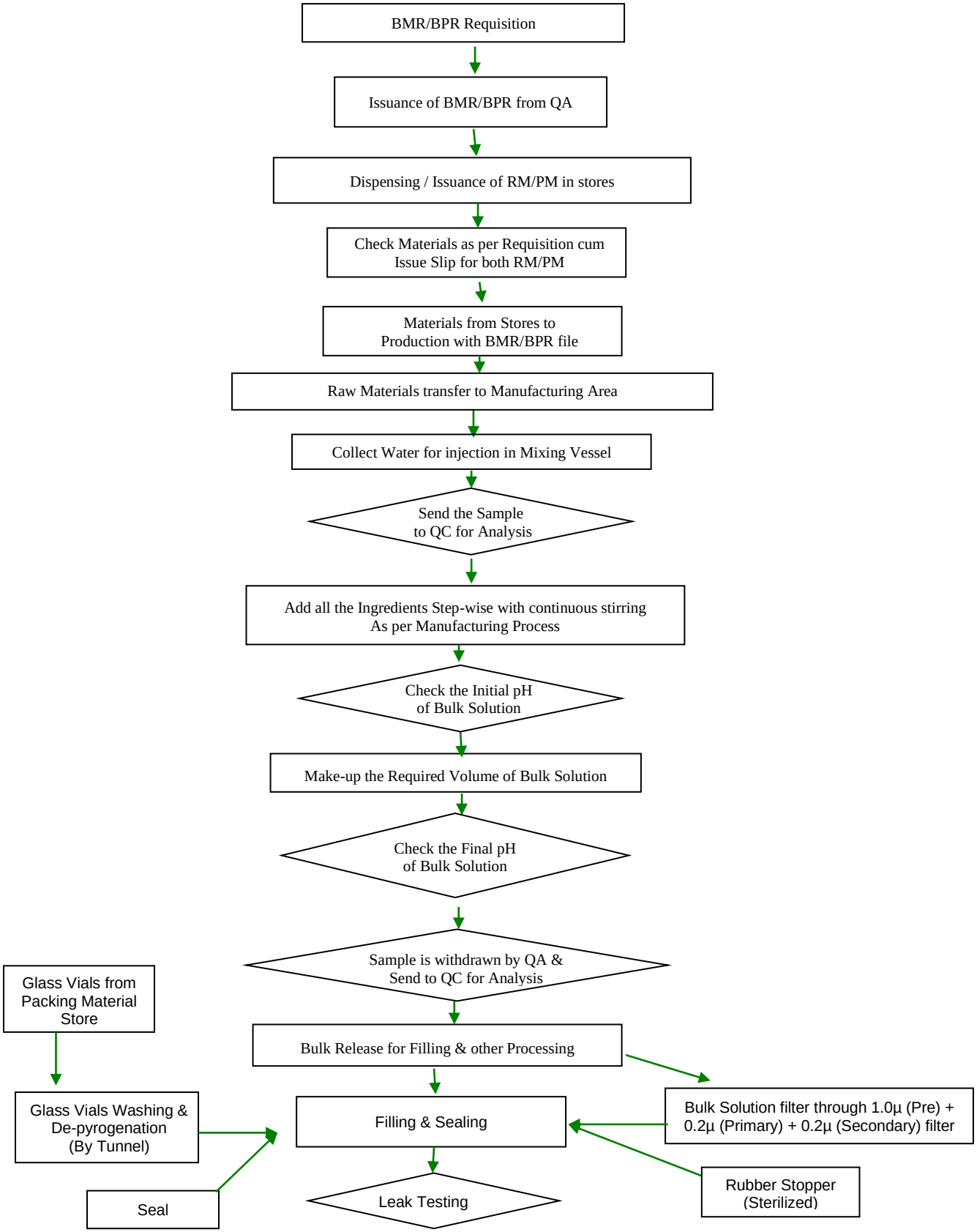
- Ensure all equipment's to be used for the manufacturing must be qualified as per Qualification acceptance criteria. The reference Qualification Documents shall be verified and mentioned in the Process Validation Report. The list of major equipment's used for manufacturing of Lidocaine Injection BP 2% w/v, 20 ml in Liquid Vial line mentioned below:

S.No.	Name of Equipment / Machine	Make	Identification No.	Capacity
1.	Mixing Vessel			1000 Ltrs.
2.	Holding Vessel			1000 Ltrs.
3.	Vial washing machine			150 Vial / min.
4.	Vial Filling & Rubber Stoppering Machine			200 Vial / min.
5.	Sterilization and Depyrogenating tunnel			-----
6.	Buffer Vessel			20 Ltrs.
7.	Sealing Machine			200 Vial / min.
8.	Autoclave			-----
9.	Mobile LAF			-----
10.	Mobile Trolley			-----
11.	Filter Integrity Machine			-----
12.	Garment Washing Machine			-----
13.	Dynamic Pass Box			-----
14.	Dynamic Pass Box			-----
15.	Sterile Garment Cabinet			-----
16.	Ceiling Suspended Vertical LAF			-----
17.	Vial Filling m/c LAF			-----
18.	Vial Sealing m/c LAF			-----
19.	Vial Automatic Inspection machine			-----
20.	Labeling Machine			-----
21.	Blister Packing machine			-----
22.	Domino Carton Coding Machine			-----

S.No.	Name of Equipment / Machine	Make	Identification No.	Capacity
23.	Carton Coding Machine			-----
24.	Cooling Zone LAF			-----

9.0	MANUFACTURING PROCEDURE
	Dispensing, bulk preparation, filtration, filling & sealing and visual inspection shall be carried out as per the approved batch manufacturing record. All respective process parameters shall be evaluated as specified in this protocol.
	After each stage of process like bulk preparation, filtration, aseptic filling, the samples shall be tested.
	Test Results and data generated during the process validation study shall be compiled and reviewed at each stage of manufacturing.
	Warehouse shall issue the primary packing materials to production department based on the batch record.
	Note: Rubber stoppers and aluminium seals are transferred to the respective processing areas.
	Vials are transferred to de-cartoning room for further processing.
	Machine parts shall be sterilized in Autoclave Bung Processor as per the pre-validated loading pattern.
	After sterilization the machine parts shall be unloaded in sterile material unloading area and aseptically transferred to the filling room through mobile LAF and Assemble the accessories aseptically on filling machine as per respective SOP.
	Vials shall be decartoned & inspected in decartoning room and transferred to the vial washing machine through conveyor.
	The vials shall be washed using vial washing machine. The washed vials are depyrogenated through the Tunnel Sterilizer.
	The depyrogenated vials are obtained on the turn table of the vial-filling machine from tunnel sterilizer. The critical area Temperature, RH and differential pressure shall be checked & recorded.
	Perform the CIP, SIP, of mixing vessel and holding vessel along with product transfer line.
	Process validation batch of Lidocaine Injection BP with a batch size of 250.00 L will be manufactured as per the approved BMR.
	After completion batch manufacturing activity, bulk solution is passed through the 0.2 µ filter from mixing vessel to holding vessel and record the filtration activity in BMR.
	Then bulk solution shall be filtered through 0.2 µ filter installed before the buffer vessel.
	Perform the filter integrity test for 0.2 µm filters before & after filtration.
	The filling machine shall fill the solution in to depyrogenated vials through the manifold, filling pump & filling needles.
	After completion of the batch sealing activity, reconcile all materials, yield are calculated and recorded in the batch record.
	Sealed vials are transferred to visual inspection and inspect the vials as per respective SOP.
	After visual inspection good vials shall be transferred to packing department.

10.0 PROCESS FLOW DIAGRAM:



11.0 DETERMINATON OF CRITICAL PROCESS PARAMETERS (but not limited):

Process Steps	Process Parameters	Rationale	Critical/ Non critical	Assessment Criteria
Dispensing	• Temperature • RH % • DP	Temperature, RH and DP is critical and shall be maintained as per API and raw material requirement.	Critical	• Temperature: NMT 25°C • RH: NMT 55% • DP: 05 to 15 Pa
Preparation of bulk solution	• Temperature • pH • Stirrer speed • Volume makeup	Temperature and pH is critical for stability of formulation. Stirrer speed should be maintained to ensure complete dissolution of API and excipients.	Critical	• Temperature: 30°C to 40°C • Stirring Speed: 250 RPM to 400 RPM • pH: 5.4 to 7.0 • 250 L
Filtration	• Filter type • Make • Filter pore size • Filter integrity • Filtration pressure	Filtration is most critical step to maintain the sterility of the product	Critical	• Sartopore- 2 • Sartorius • 0.2 µ • ≥ 3172 mbar • ≥ 5000 mbar
Vial washing	• Pressure of Compressed Air • Pressure of Recycled WFI-1 • Pressure of Recycled WFI-2 • Pressure of WFI • Speed of vial washing machine	During washing all respective parameters need to be checked for achievement of specified limit mentioned in respective BMR/SOP for proper cleaning of each Vial	Critical	• Pressure of Compressed Air 0.20 to 0.66 MPa • Pressure of Recycled WFI-1 0.12 to 0.60 MPa • Pressure of Recycled WFI-2 0.12 to 0.60 MPa • Pressure of WFI 0.07 to 0.30 MPa • 50 to 150 vials/min
Depyrogenation of Vials	• Temperature • DP of Drying, Heating and cool zone	During Depyrogenation all respective parameters need to be checked for achievement of specified limit	Critical	• Preheating Zone • Heating Zone: More Than 320ºC • Cooling Zone: NMT 30ºC

Process Steps	Process Parameters	Rationale	Critical/ Non critical	Assessment Criteria
	• Conveyor speed	mentioned in respective BMR/SOP for proper Depyrogenation of each Vial.		• Preheating Zone (HEPA Filter) – 05-10 Pa • Heating Zone (HEPA Filter) – 06-12 Pa • Cooling Zone (HEPA Filter) – 05-10 Pa • NMT 130 mm/min
Aseptic filling and Stoppering of vials	• Filling Speed • Fill Volume verification • Stoppering • Filling duration	Fill volume and filling speed is critical for content uniformity.	Critical	• 100 to 200 vials/min • 20.5 ml to 21.5 ml • Full stoppering shall be done
Val Sealing machine	• Sealing quality • Sealing integrity • Sealing speed	Critical with reference to integrity of the product sealed vials, check for sealing quality and integrity (Leak test)	Critical	• Free from sealing defect • Leak test shall be passed • 100 to 200 vials/min
Visual inspection	• Critical, major, minor defects	Removal of defective Vials	Critical	• Visual inspection shall be done as per respective SOP

11.1 HOLD TIME OF COMPONENT:

- Cleaned & sterilized component/garments shall be used within the recommended hold time of respective components and shall be stored under LAF unit.
- Hold time shall be considered from the process end time i.e. cleaning & sterilization upto the uses of components.
- Recommended hold time of various component at different stages is mentioned below.

S.No.	Location	Stage	Component	Recommended Hold Time
1.	Glass Vial Line	After Cleaning	Mixing Vessel	24 Hours
2.			Holding Vessel	24 Hours
3.			m/c Parts	24 Hours
4.		After Sterilization	Sterile Garments	48 Hours
5.			Mixing Vessel	24 Hours
6.			Holding Vessel	24 Hours
7.			m/c Parts	24 Hours

12.0 SAMPLING AND ANALYSIS PLAN:

- Collect the samples at various intervals at different operations as per the Sampling Plan mentioned below.

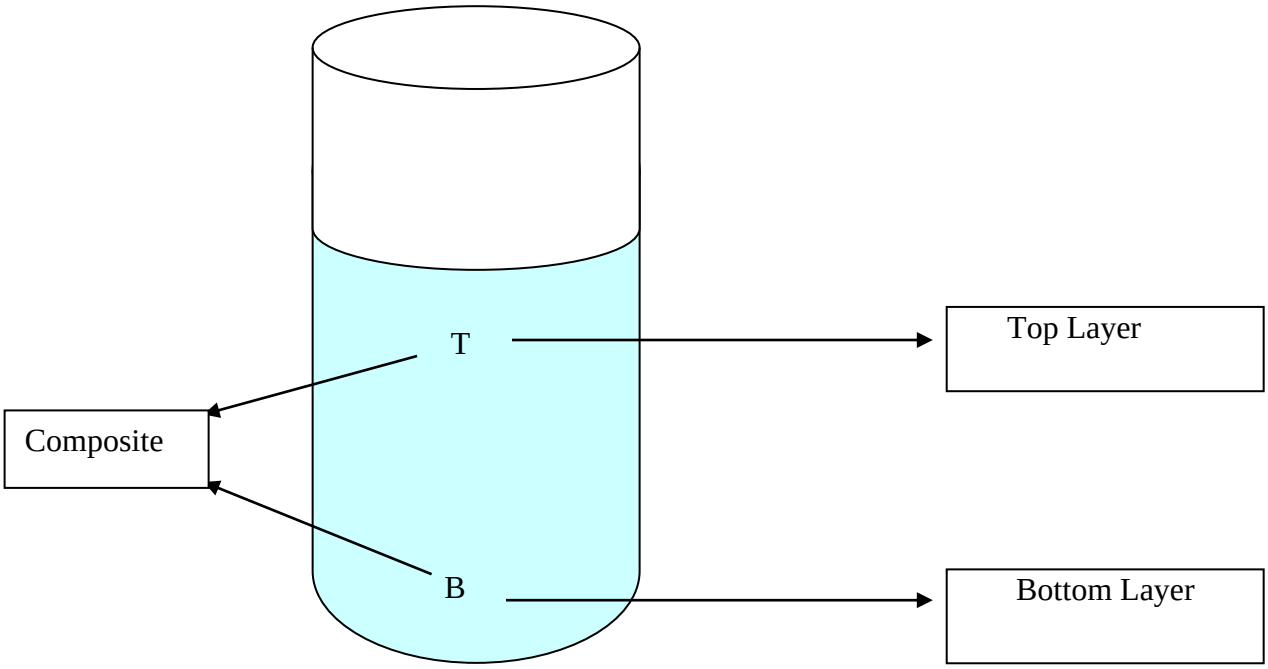
STAGE	Location of Collection	Test to be performed	Sample size	Responsibility
Cleaning of Equipment's	Mixing Vessel	Description	100 ML	QA/QC & Production
		Clarity		
		pH		
		Conductivity		
	Holding Vessel	Description	100 ML	
		Clarity		
		pH		
		Conductivity		
	M/c Parts	Description	100 ML	
		Clarity		
		pH		
		Conductivity		
Water for Injection	Before batch mixing	Description	100 ML	QA/QC & Production
		pH		
		Conductivity		
		BET	10 ml	QA/Micro & Production
Preparation of Bulk Solution	Bulk Mixing after 15 min. (Top)	Description	50 ML	QA/QC & Production
		pH		
		Assay		
	Bulk Mixing after 15 min. (Bottom)	Description	50 ML	
		pH		
		Assay		
	Bulk Sample before Filtration	Description	100 ML	
		pH		
		Weight per ml		
		Assay		
		Preservative Content		
		Bioburden	100 ML	QA/Micro & Production
Filtration of Bulk Solution	Bulk sample after filtration	Sterility	100 ML	QA/Micro & Production
Conveyor Belt	Vial Before Washing	Bio burden	10 Nos.	QA/Micro & Production

PROCESS VALIDATION PROTOCOL FOR LIDOCAINE INJECTION BP 2% w/v, 20 ml

STAGE	Location of Collection	Test to be performed	Sample size	Responsibility
Washing Vials	Washed Vial (Initial, Middle, End)	Visual Inspection	36 Nos. from each stage	QA/QC & Production
		Clarity Test by LBPC		
	Vial After Washing	Bio burden	10 Nos.	QA/Micro & Production
Sterilized Rubber Stopper	Initial, Middle and End of filling Stage	Sterility	22 Nos.	QA/Micro & Production
		BET		
		Visual Inspection		
Flip-off seal	Sanitization seal of initial, middle & end stage	Bio Burden	20 Nos. from each stage	QA/Micro /Production
Depyrogenated Vial	Initial, Middle and End Stage	Sterility, BET	22 Nos. from each stage.	QA/QC & Production
Nitrogen gas from user point	Initial of filling	Sterility	1000 Ltr.	QC Micro
	Middle of filling	Sterility	1000 Ltr.	
	End of filling	Sterility	1000 Ltr.	
Filling & Sealing	Initial, Middle and End Stage of filling Duration	Description	18 Nos. from each stage	QA/QC & Production
		pH		
		Extractable Volume		
		2,6-Dimethylaniline		
		Particulate Contamination		
		Assay		
		Preservative Content		
		Sterility	22 Nos. from each stage	QA/Micro & Production
		BET		
	Finished Sample	Description	18 Nos.	QA/QC & Production
		Identification		
		pH		
		Related Substance		
		Extractable Volume		
		2,6-Dimethylaniline		
		Particulate Contamination		
		Assay		
		Preservative Content		
		Sterility	22 Nos.	QA/Micro & Production
		BET		

13.0 SAMPLING LOCATIONS:

MIXING VESSEL:



T = Top Layer

B = Bottom Layer

T + B = Composite (Bulk sample before filtration)

14.0 ACCEPTANCE CRITERIA:

S.No.	Stage	Test	Acceptance criteria
1.	Cleaning of equipment's	**Description**	Clear Colorless Liquid.
		Clarity	Should be clear
		pH	5.0 to 7.0
		Conductivity	NMT 1.3 µS/cm
2.	Water for Injection	**Description**	Clear Colorless Liquid.
		pH	5.0 to 7.0
		Conductivity	NMT 1.3 µS/cm
		BET	NMT 0.25 EU/ml
3.	Vial Before Washing	**Bio-burden**	For Informative
4.	Vial Washing	**Visual Inspection**	Should be visually clean
		Clarity Test by LBPC	
		Visible particles	Should be free from any visible particulate matter
		For sub visible particles	(i) ≥ 10µm - NMT 6000 / container (ii) ≥ 25µm - NMT 600 / container
		Bio-burden	NMT 10 CFU / 100 ml
5.	Depyrogenated Empty Vial	**Sterility**	Should be sterile after 14 days of incubation.
		BET	NMT 0.25 EU/ml
6.	Nitrogen Gas	**Sterility**	Should be sterile after 14 days of incubation.
7.	Bulk Mixing	**Description**	A Clear colorless solution.
		pH	5.4 to 7.0
		Weight per ml	0.997 g/ml to 1.070 g/ml
		Color Index	NMT 0.200 AU
		Assay: **Each ml contains:** Lidocaine Hydrochloride Monohydrate Ph Eur 20 mg	19.40 mg to 21.00 mg (97.0 % to 105.0 % of label claim)
		Preservative Content Methyl Hydroxybenzoate BP 2 mg	1.600 mg to 2.400 mg (80.0 % to 120.0 % of label claim)
8.	Filling and Sealing	**Description**	A clear colorless solution filled in clear glass molded vial 20 ml plugged with 20 mm Bromo butyl rubber stopper and sealed with 20 mm white

S.No.	Stage	Test	Acceptance criteria
			flip off aluminum seal.
		Identification	
		A. By Chemical Reaction	A bluish-green precipitate is produced.
		B. Melting Point	Melts at about 229˚C
		C. Chloride	A curdled white precipitate should be formed. The precipitate should be dissolve easily with the possible exception of a few large particles which dissolve slowly.
		D. HPLC (Methyl Hydroxybenzoate)	The retention time of the major peak of the sample solution should be corresponds to that of the standard solution obtained as directed in the assay.
		pH	5.0 to 7.0
		Related Substance	
		Unspecified impurities	NMT - 0.10%
		Total Unspecified impurities	NMT - 0.50%
		Bacterial Endotoxins	Not More Than 1.1 EU/mg of Lidocaine Hydrochloride
		Extractable Volume	NLT 20.0 ml
		Test for Sterility	Should comply test of sterility.
		2,6-Dimethylaniline	NMT 400 ppm
		Particulate Contamination	
		Visible particles	Should be free from any visible particulate matter
		Sub visible particles	(i) ≥ 10 micron - NMT 6000 / container (ii) ≥ 25 micron - NMT 600 / container
		Assay: Each ml contains: Lidocaine Hydrochloride Monohydrate Ph Eur 20 mg	19.00 mg to 21.00 mg (95.0 % to 105.0 % of label claim)
		Preservative Content Methyl Hydroxybenzoate BP 2 mg	For Information

15.0 CONTINUOUS PROCESS VERIFICATION:

Continuous Process Verification will be carried out for continuous monitoring of manufacturing process both Critical Quality Attributes & Critical Process Parameter as per SOP.

16.0 DEVIATIONS:

All protocol deviation, non-conformances and out of specification results obtained shall be investigated in accordance with corresponding SOP's and documented in the validation report.

17.0 VALIDATION REPORT:

A Validation Report shall be prepared as per the sampling and analysis plan mentioned in this Protocol by Quality Assurance Department. This Report shall be pre-approved by all functional heads of all the concerned departments. Validation data shall be recorded by Quality Assurance Department in the controlled copy of the pre-approved Process Validation Report. This Process Validation Report shall be reviewed and then post-approved by all functional heads of all the concerned departments.

18.0 CONCLUSION:

Validation data shall be written on Process Validation Report, clearly stating the achievement or Non-compliance of the acceptance criteria, effect of the deviations made during the validation and in case of failure, investigation carried out and their findings.

19.0 REFERENCE DOCUMENTS:

19.1 Relevant Specifications and Standard Testing Procedures

19.2 Relevant Standard Operating Procedures

19.3 Relevant Qualification Documents

19.4 British Pharmacopoeia

19.5 Supplementary Guidelines on (GMP): Validation

20.0 LIST OF ATTACHMENTS:

The relevant following documents to be attached with the Validation Report:

1. Records for all critical parameters with graphical representation, where applicable.
2. Relevant Sterilization Charts
3. Raw Data of Validation Testing.
4. Certificate of Analysis of API.
5. Certificate of Analysis of Finished Product.

21.0 ABBREVIATIONS:

API	Active Pharmaceutical Ingredient
BP	British Pharmacopoeia
BMR	Batch Manufacturing Record
BPR	Batch Packing Record
GMP	Good Manufacturing Practice
IPQA	In-process Quality Assurance
NLT/NMT	Not Less Than/ Not More Than
SOP	Standard Operating Procedure
STP	Standard Testing Procedure
w/v	Weight by volume
BET	Bacterial Endotoxins Test
CIP	Clean in Place
SIP	Sterilization in Place

22.0 REVISION HISTORY:

Revision No.	Change Control No.	Detail of Changes	Reason for Change	Effective Date	Updated By
00		NA	New Protocol		