PROCESS VALIDATION PROTOCOL CUM REPORT

FOR

CARBONYL IRON, VITAMINS, ZINC AND ANTIOXIDANTS CAPSULES

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1.0 PROTOCOL APPROVAL :

1.1 Prepared By :

Dept.	Name	Designation	Signature	Date
Quality Assurance	P. Vadivel	Sr. Executive QA	P. Vadivel	16/02/2023

1.2 Verified By:

Dept.	Name	Designation	Signature	Date
Head-Production	G. Vijayalakshmi	Sr. Manager	Vijayalakshmi	15/02/23
Head-Quality Control	M. Vijaya Kumar	AGM	[illegible]	15/02/23

1.3 Approved By:

Dept.	Name	Designation	Signature	Date
Head-Quality Assurance	A. G. KANNAN	GM-QA	A. [illegible]	16/02/2023

2.0 PURPOSE:

To establish that the manufacturing process blending validation of Carbonyl Iron, Vitamins, Zinc and Antioxidants capsules will meet the predetermined specifications and quality attributes consistently.

3.0 SCOPE:

This protocol is applicable for the manufacturing and sampling of validation batches of Carbonyl Iron, Vitamins, Zinc and Antioxidants capsules with a batch size of 13, 50,000. In case data obtained from validation batches seem to be inadequate, further extension of the validation batches shall be done. For further confidence of efficacy and fitness till its assigned shelf life, these three batches shall be charged for both Long term and Accelerated stability study.

4.0 RESPONSIBILITIES OF VALIDATION TEAM:

Validation Team	Responsibilities
Quality Assurance	1) Defining the manufacturing process and process parameters that impact the quality, safety, purity and efficacy of the product based on the knowledge gained through process validation.
	2) To ensure pre-requisite requirements are completed before proceeding for Process validation.
	3) Preparation of Process validation Protocol cum report.
	4) In-process monitoring and assurance of quality. Withdrawal of samples as per the sampling plan defined in this protocol.
	5) Review of batch records, analytical reports, compilation of data, evaluation of results and Process validation report.
	6) Reviewing and approving investigations and CAPA for deviations from defined manufacturing process and Process Validation protocol.
Production	1) Review of Process Validation protocol cum report.
	2) Execution of process as per the batch record and Process validation protocol and relevant operating procedures.
	3) Co-ordination with Quality Assurance for sampling.
	4) Investigating any deviations from defined manufacturing process and Process Validation protocol and identifying CAPA.
Quality Control	1) Review of Process validation protocol cum report.
	2) Testing the samples drawn during Process validation study and compilation of results.
Engineering	1) Providing necessary utility as per the product requirement.
	2) Ensuring calibration of measuring devices available on process equipment and utilities and maintenance of processing Equipments.
Head Quality Assurance	1) Approval of Protocol cum report. 2) To review and approve the investigations and CAPA for deviations from defined manufacturing process and protocol. 3) To take decision on further release and distribution of validation batches.

5.0 ACCEPTANCE CRITERIA:

All the product quality parameters must comply within the acceptance criteria as specified in this protocol.

6.0 PROCEDURE:

Execute three batches as per Master Formula Record and Batch Manufacturing Record. Record the critical parameters of the manufacturing unit operations as described in this protocol and compile subsequent test report. Raise deviation as per ST/QA/005. If any abnormalities found during the process validation. Necessary corrective actions and preventive actions shall be taken as per SOP No.: ST/QA/043 before proceeding to validation of commercial batches.

7.0 PRODUCT DETAILS:

Product Name : CARBONYL IRON, VITAMINS, ZINC AND ANTIOXIDANTS CAPSULES			
BRAND NAME:			
Batch No :			
Batch Size :			
Mfg. Date :			
Expiry Date :			

Product Name	Carbonyl Iron, Vitamins, Zinc and Antioxidants capsules
Label Claim	Each hard Gelatin Capsule contains: Carbonyl Iron Equivalent to Elemental Iron 100mg Folic acid BP 500mcg Cyanocobalamin (coated) 15mcg (Vitamin B12) Ascorbic Acid (coated) 75mg Zinc sulphate Monohydrate BP 61.8mg (Equivalent to Elemental Zinc 22.5mg) Alpha Tocopheryl Acetate BP 15 IU Sodium Selenate Equivalent to Selenium 65mcg Approve colours used in empty hard gelatin capsule. Appropriate overages of Vitamins are added to compensate the loss on storage.
Shelf life	36 Months
Storage Condition	Store in cool and dry place, Keep away from light and moisture.
Batch Size	13,50,000 Capsules
Therapeutic Use	Carbonyl iron is used to treat or prevent iron deficiency and iron deficiency anaemia. This medication is a multivitamin product used to treat or prevent vitamin deficiency due to poor diet, certain illnesses, or during pregnancy. Vitamins are important building blocks of the body and help keep you in good health.
Product Pack	Printed Foil: 160mm blister aluminum foil (0.025mm thickness). Base Foil: 164mm PVDC clear foil.
Pack Style	3 x 10's blister pack

8.0 REFERENCE DOCUMENTS FOR METHOD OF MANUFACTURING AND TESTING:

S.No.	NAME OF THE DOCUMENT	DOCUMENT NUMBER
1	Master Formula Record	ST/MFC/135/R1
2	Batch Manufacturing Record	STBMR:452/00
3	Product specifications and Test Procedure	IMSR00221-00 IMTR00221-00

9.0 REASON FOR VALIDATION:

Reasons	Tick in the appropriate row	Reasons	Tick in the appropriate row
New formulation		Significant changes in process	
Change in formulation		Change/modification in equipment	
Change in location		Change in batch size	
Change in vendor of API		Any other reasons (specify)	

10.0 BILL OF RAW MATERIALS : ACTIVE PHARMACEUTICAL INGREDIENTS

S. No	Name of the Ingredients	Material Code	Label claim per tablet in mg	Spec	Overages	Total Qty (Kg)	Approved Vendor
1	Carbonyl Iron	RMAC0073	100.000	USP	Nil	135.0000	PARAS ORGANICS PVT.LTD
2	Folic Acid	RMAF0018	500.000 mcg	BP	20	0.810	MCCOY DRUGS PVT.LTD
3	Cyanocobalamin	RMAC0066	15mcg	BP	50	30.375gm	HEBEI YUXING PHARMACEUTICAL

S. No	Name of the Ingredients	Material Code	Label claim per tablet in mg	Spec	Overages	Total Qty (Kg)	Approved Vendor
4	Ascorbic Acid	RMAA0029	75.000	BP	20	121.500	BAJAJ HEALTHCARE LTD
5	Zinc Sulfate Monohydrate	RMAZ0009	61.800	BP	20	100.116	SHREEJI INDUSTRIES
6	Alpha Tocopheryl Acetate	RMAA0030	15 IU	BP	20	48.600	EMMER CHEM/SHREENATH
7	Sodium Selenate	RMAS0028	65 mcg	IH	25	262.500gm	SNA HEALTHCARE
* Quantity varies based on Potency Calculation							

INDENT OF EXCIPIENTS:

S.No	Name of the Ingredients	Material Code	Unit dose per tablet in mg	Spec	Total Qty (Kg)	Approved Vendor
8	Hydrophobic Colloidal anhydrous silica	RMEC0017	3.000	BP	4.050	WACKER
9	Microcrystalline crystalline cellulose PH 102	RMEM0038	166.022	BP	224.127	DFE
10	Calcium hydrogen phosphate	RMED0015	10.000	BP	13.500	INNOPHOS,INDIA PHOSPHATE
11	Purified Talc	RMET0012	10.000	BP	13.500	NEELKANTH
12	Magnesium stearate	RMEM0033	10.000	BP	13.500	NITIKA

EMPTY HARD GELATIN CAPSULE

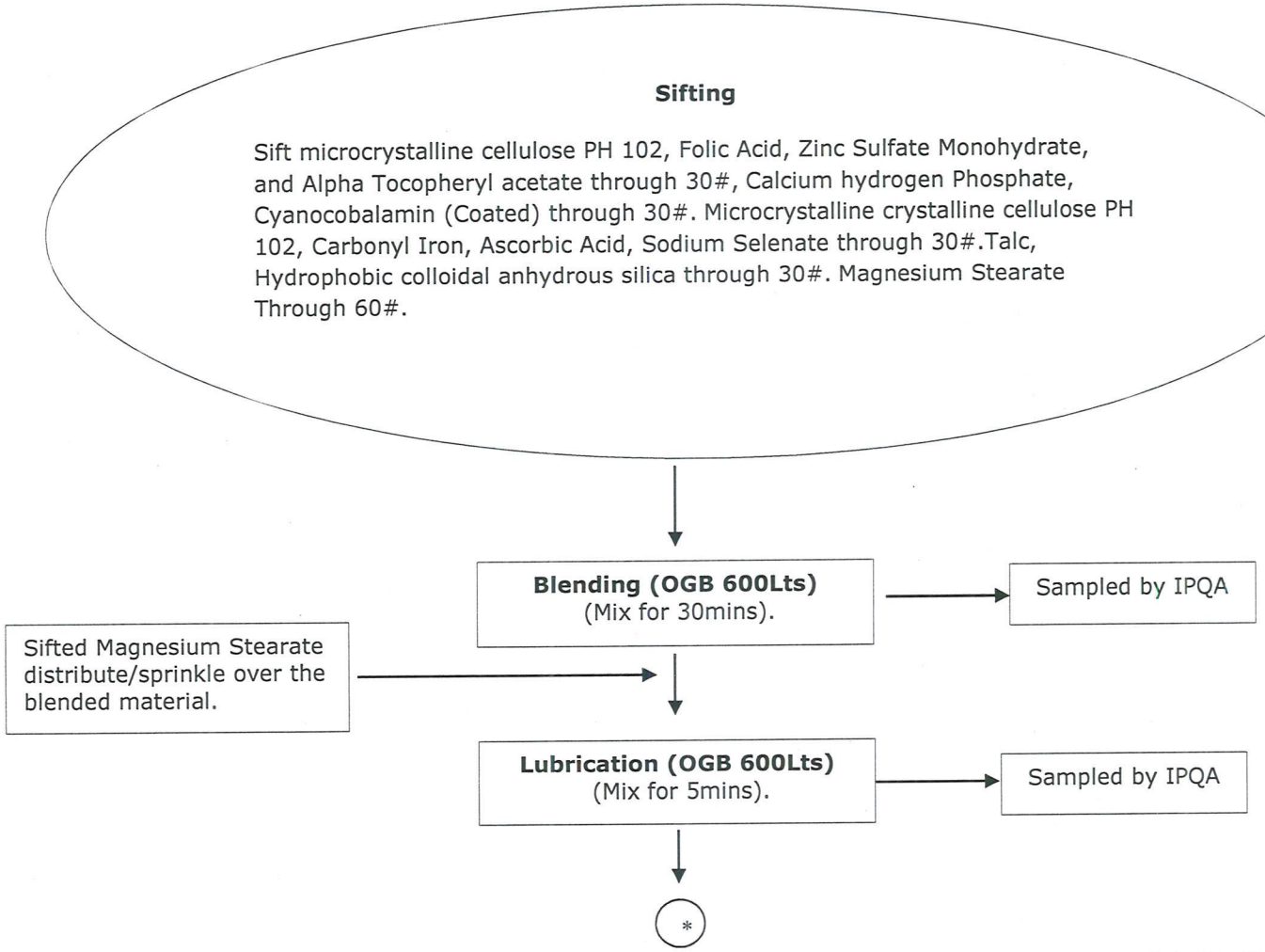
S. No	Name of the Ingredients	Material Code	Spec	Overages	Total Qty (Kg)	Vendor
1	"0" Size Red/Red hard gelatin capsule(GHPL Printed)	RMER0012	IHS	NIL	1363500	ERAWAT PHARMA

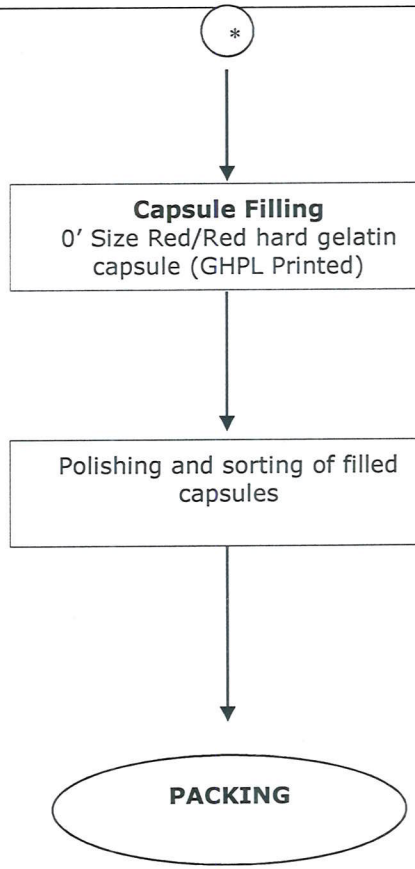
11.0 EQUIPMENT DETAILS:

Table 1: List of major process equipment to be used in the manufacturing:

SR. NO.	EQUIPMENT	MAKE	EQUIPMENT NO.
1.0	Weighing Balances	ESSAE TERAOKA	ST/SRWB/001, ST/SRWB/002, ST/WB/189, ST/PRWB/002, ST/WB/205, ST/WB/202 or ST/WB/207
2.0	Vibro Sifter	GEM Pharma	ST/PRG/006, ST/PRG/007, ST/PRG/008,
4.0	Octagonal blender (2200lts)	SRI KARPAGA VINAYAKA	ST/PROB/001

12.0 PROCESS FLOW CHART




*
Capsule Filling
0' Size Red/Red hard gelatin capsule (GHPL Printed)
Polishing and sorting of filled capsules
PACKING

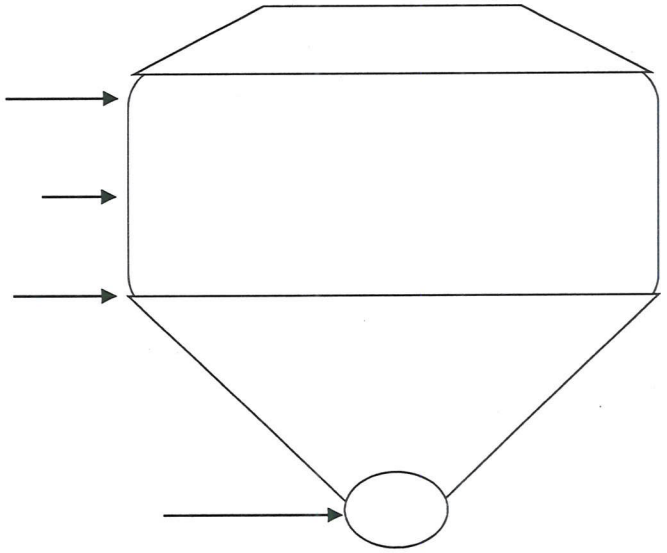
13.0 CRITICAL PROCESS STAGES TO BE VALIDATED:

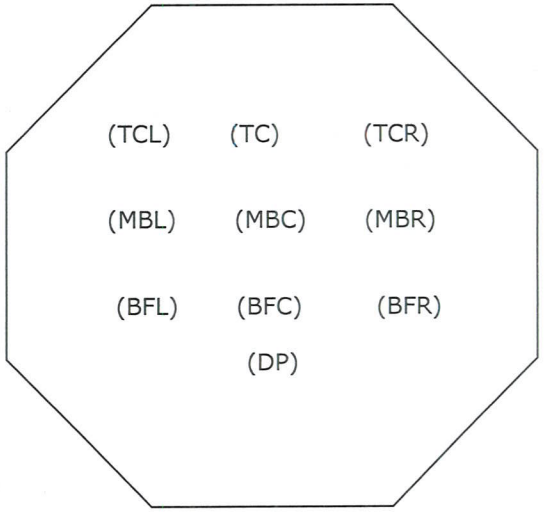
13.1 BLENDING AND LUBRICATION STAGE:

BLENDING AND LUBRICATION PROCEDURE (Refer MFR/BMR more details)	**CRITICAL PARAMETER TO BE VALIDATED**	**SAMPLING PROCEDURE**
Step-1 Sift microcrystalline cellulose PH 102, Folic Acid, Zinc Sulfate Monohydrate, and Alpha Tocopheryl acetate through 30#, Calcium hydrogen Phosphate, Cyanocobalamin (Coated) through 30#. Microcrystalline crystalline cellulose PH 102, Carbonyl Iron, Ascorbic Acid, Sodium Selenate through 30#.Talc, Hydrophobic colloidal anhydrous silica through 30#. Magnesium Stearate Through 60#. Mix for 30mins. Step - 2 Sifted Magnesium Stearate distribute/sprinkle over the blended material. (Mix for 5mins).	1. Mixing time **(Pre-lubricated blend uniformity)** 2. Mixing time **(Lubricated blend uniformity)**	**Step- 1: PRE - LUBRICATION:** Samples shall be withdrawn from 10 different locations Collect approximately 2 g of blend sample location from top, middle and bottom level of the Octagonal blender (as per sampling diagram 13.2) separately by using sampling thief after **30 minutes** mixing**.** Use these samples for blend uniformity test as per 14.1.1.1 **Step- 2: AFTER LUBRICATION:** Samples shall be withdrawn from 10 different locations Collect approximately 2 g of lubrication blend sample location from top, middle and bottom level of the Octagonal blender (as per sampling diagram 13.2) separately using sampling thief after **5 minutes** mixing. Use these samples for blend uniformity test as per 14.1.1.2

13.2 SAMPLING LOCATIONS IN OCTAGONAL BLENDER:

SIDE VIEW





Samples are to be drawn from 10 different positions as follows:

TCL – Top center left
TC - Top center
TCR – Top center right
MBL – Middle back left
MBC – Middle back center
MBR – Middle back right
BFL – Bottom front left
BFC – Bottom front center
BFR – Bottom front right
DP - Discharge port

14.0 TEST PROGRAM AND ACCEPTANCE CRITERIA FOR VALIDATION:

14.1 GRANULATION PROCESS :

S.No.	MEASURED PARAMETERS	ACCEPTANCE CRITERIA	TEST PROCEDURE
14.1.1	**BLENDING & LUBRICATION PROCESS:**		
14.1.1.1	**BLENDING – PRE LUBRICATION:**		
1	**Blend uniformity:**	Individual sample values between (85.0% to 115.0% of label claim) & RSD: NMT 5 % and Average value between (90.0% to 110.0%).	Specification and test procedure no: IMSR00221-00 IMTR00221-00
14.1.1.2	**LUBRICATION:**		
1	**Appearance** (pooled sample)	White colour granular powder	Specification and test procedure no: IMSR00221-00 IMTR00221-00
2	**Blend uniformity:**	Individual sample values between (85.0% to 115.0% of label claim) & RSD: NMT 5 % and Average value between (90.0% to 110.0%).	
3	**Bulk density** (pooled sample)	For information only	NA
4	**Tap density** (pooled sample)	For information only	

15.0 TEST DATA FOR VALIDATION OF BLENDING & LUBRICATION STAGE –1ST ,2ND & 3RD BATCHES

15.1 TEST DATA FOR BLENDING STAGE: 1ST BATCH NO.:

S. No	MEASURED PARAMETERS	ACCEPTANCE CRITERIA	SAMPLE LOCATION	TEST RESULTS Mixing time (30 minutes)	
				FOLIC ACID	ALPHA TOCOPHERYL ACETATE
1	**Blend uniformity:**	Individual sample values between 85.0% to 115.0% of label claim & RSD: NMT 5 % and Average value between 90.0% to 110.0%.	**TCL**		
			TC		
			TCR		
			MBL		
			MBC		
			MBR		
			BFL		
			BFC		
			BFR		
			DP		
			Avg.		
			RSD		
			Composite		
All the validation test results of blending stage are found to be **satisfactory/not satisfactory.**				**QA-Sign & Date:**	

15.1.1 TEST DATA FOR BLENDING STAGE: 2ND BATCH NO.:

S. No	MEASURED PARAMETERS	ACCEPTANCE CRITERIA	SAMPLE LOCATION	TEST RESULTS Mixing time (30 minutes)	
				FOLIC ACID	ALPHA TOCOPHERYL ACETATE
1	**Blend uniformity:**	Individual sample values between 85.0% to 115.0% of label claim & RSD: NMT 5 % and Average value between 90.0% to 110.0%.	**TCL**		
			TC		
			TCR		
			MBL		
			MBC		
			MBR		
			BFL		
			BFC		
			BFR		
			DP		
			Avg.		
			RSD		
			Composite		

All the validation test results of blending stage are found to be **satisfactory/not satisfactory.**	**QA-Sign & Date:**

15.1.2 TEST DATA FOR BLENDING STAGE: 3RD BATCH NO.:

S. No	MEASURED PARAMETERS	ACCEPTANCE CRITERIA	SAMPLE LOCATION	TEST RESULTS Mixing time (30 minutes)	
				FOLIC ACID	ALPHA TOCOPHERYL ACETATE
1	**Blend uniformity:**	Individual sample values between 85.0% to 115.0% of label claim & RSD: NMT 5 % and Average value between 90.0% to 110.0%.	**TCL**		
			TC		
			TCR		
			MBL		
			MBC		
			MBR		
			BFL		
			BFC		
			BFR		
			DP		
			Avg.		
			RSD		
			Composite		

All the validation test results of blending stage are found to be **satisfactory/not satisfactory.**	**QA-Sign & Date:**

15.2 TEST DATA FOR LUBRICATION STAGE:

S. No	MEASURED PARAMETERS	ACCEPTANCE CRITERIA	SAMPLE LOCATION	TEST RESULTS FOR FOLIC ACID Mixing time (5 minutes)		
				1ST B.NO:	2ND B.NO:	3RD B.NO:
1	**Blend uniformity:**	Individual sample values between 85.0% to 115.0% of label claim & RSD: NMT 5 % and Average value between 90.0% to 110.0%.	**TCL**			
			TC			
			TCR			
			MBL			
			MBC			
			MBR			
			BFL			
			BFC			
			BFR			
			DP			
			Avg.			
			RSD			
			Composite			

All the validation test results of Lubrication stage are found to be **satisfactory/not satisfactory.**	**QA-Sign & Date:**

15.2.1 TEST DATA FOR LUBRICATION STAGE:

S. No	MEASURED PARAMETERS	ACCEPTANCE CRITERIA	SAMPLE LOCATION	TEST RESULTS FOR ALPHA TOCOPHERYL ACETATE Mixing time (5 minutes)		
				1ST B.NO:	2ND B.NO:	3RD B.NO:
1	**Blend uniformity:**	Individual sample values between 85.0% to 115.0% of label claim & RSD: NMT 5 % and Average value between 90.0% to 110.0%.	**TCL**			
			TC			
			TCR			
			MBL			
			MBC			
			MBR			
			BFL			
			BFC			
			BFR			
			DP			
			Avg.			
			RSD			
			Composite			

All the validation test results of Lubrication stage are found to be **satisfactory/not satisfactory.**	**QA-Sign & Date:**

15.3 TEST DATA FOR LUBRICATION STAGE :

S.No	MEASURED PARAMETERS	ACCEPTANCE CRITERIA	TEST RESULTS 1ST Batch No.:
		ON POOLED SAMPLE	
1	**Appearance**	White colour granular powder	
2	**Bulk Density**	For information only	
3	**Tapped Density**	For information only	
4	**PARTICLE SIZE OF RETAINS:**		
	1. #20 Mesh 2. #30 Mesh 3. #40 Mesh 4. #60 Mesh 5. #80 Mesh 6. #100 Mesh	For information only	
	Particle size of passing:		
5	1. #100 Mesh	For information only	

QA-Sign & Date:

15.4 CONCLUSION ON VALIDATION OF BLENDING & LUBRICATION STAGE OF 1ST,2ND & 3RD BATCH

1. All the validation test results of Blending stage of Carbonyl Iron, Vitamins, Zinc and Antioxidants capsules are found to be **Satisfactory/Not Satisfactory** after **30 Minutes** Mixing.

2. All the validation test results of Lubrication stage of Carbonyl Iron, Vitamins, Zinc and Antioxidants capsules are found to be **Satisfactory/Not Satisfactory** after **5 Minutes** Mixing.

S.No	Process stage	Equipment	Fixed Standard (minutes)
1	Blending stage	Octagonal Blender	
2	Lubrication stage	Octagonal Blender	

Head-Quality Assurance:_____
(Sign & Date)

Note: If the test results are not found satisfactory raise unplanned deviation. Necessary corrective actions and preventive actions shall be taken before proceeding to validation of commercial batches.

7.0 TEST DATA FOR CAPSULE FILLING STAGE : (Initial, Middle, Final) 1ST,2ND& 3RD BATCH

7.1 TEST DATA FOR CAPSULE FILLING STAGE :1ST BATCH 1ST B.No:

CRITICAL PARAMETER-1: 1ST BATCH			TEST RESULTS		
S.No	**MEASURED PARAMETERS**	**ACCEPTANCE CRITERIA**	**Initial stage**	**Middle stage**	**Final stage**
1.0	**Appearance**	Red/Red coloured '0' size GHPL printed on both body and cap Hard gelatin capsule Filled with pale green colour granular powder.			
2.0	**Average weight of a capsule**	595mg ± 3.0% (Limit: 577.150 mg to 612.850 mg)			
3.0	**Net fill weight**	500 mg ± 3.0% (Limit:475.0 mg to 525.0 mg)			
4.0	**Uniformity of fill Weight**	±7.5% of average fill weight			
5.0	**Disintegration Time**	NMT 30 minutes in 37°C ± 2°C			
6.0 Assay: Each Hard gelatin Capsule contains:					
6.1	**Folic Acid BP 500mcg**	NLT 90% of the labeled claim			
6.2	**Alpha Tocopheryl Acetate Concentrate 50% BP 15IU**	NLT 90% of the labeled claim			

Comments:

QA-Sign & Date:

7.1.1 TEST DATA FOR CAPSULE FILLING STAGE :2ND BATCH **2nd B.No:**

CRITICAL PARAMETER-1: 2ND BATCH			TEST RESULTS		
S.No	**MEASURED PARAMETERS**	**ACCEPTANCE CRITERIA**	**Initial stage**	**Middle stage**	**Final stage**
1.0	**Appearance**	Red/Red coloured '0' size GHPL printed on both body and cap Hard gelatin capsule Filled with pale green colour granular powder.			
2.0	**Average weight of a capsule**	595mg ± 3.0% (Limit: 577.150 mg to 612.850 mg)			
3.0	**Net fill weight**	500 mg ± 3.0% (Limit:475.0 mg to 525.0 mg)			
4.0	**Uniformity of fill Weight**	±7.5% of average fill weight			
5.0	**Disintegration Time**	NMT 30 minutes in 37°C ± 2°C			
6.0 Assay: Each Hard gelatin Capsule contains:					
6.1	**Folic Acid BP 500mcg**	NLT 90% of the labeled claim			
6.2	**Alpha Tocopheryl Acetate Concentrate 50% BP 15IU**	NLT 90% of the labeled claim			

Comments:

QA-Sign & Date:

7.1.2 TEST DATA FOR CAPSULE FILLING STAGE :3RD BATCH **3rd B.No:**

CRITICAL PARAMETER-1: 3RD BATCH			TEST RESULTS		
S.No	**MEASURED PARAMETERS**	**ACCEPTANCE CRITERIA**	**Initial stage**	**Middle stage**	**Final stage**
1.0	**Appearance**	Red/Red coloured '0' size GHPL printed on both body and cap Hard gelatin capsule Filled with pale green colour granular powder.			
2.0	**Average weight of a capsule**	595mg ± 3.0% (Limit: 577.150 mg to 612.850 mg)			
3.0	**Net fill weight**	500 mg ± 3.0% (Limit:475.0 mg to 525.0 mg)			
4.0	**Uniformity of fill Weight**	±7.5% of average fill weight			
5.0	**Disintegration Time**	NMT 30 minutes in 37°C ± 2°C			
6.0 Assay: Each Hard gelatin Capsule contains:					
6.1	**Folic Acid BP 500mcg**	NLT 90% of the labeled claim			
6.2	**Alpha Tocopheryl Acetate Concentrate 50% BP 15IU**	NLT 90% of the labeled claim			

Comments:

QA-Sign & Date:

7.2 TEST DATA FOR CAPSULE FILLING STAGE: (COMPOSITE SAMPLE)

CRITICAL PARAMETER-4 : 1ST BATCH **1ST B.No:**

S.No	MEASURED PARAMETERS	ACCEPTANCE CRITERIA	TEST RESULTS
1.0	Appearance	Red/Red coloured '0' size GHPL printed on both body and cap Hard gelatin capsule Filled with pale green colour granular powder.	
2.0	Average weight of a capsule	595mg ± 3.0% (Limit: 577.150 mg to 612.850 mg)	
3.0	Net fill weight	500 mg ± 3.0% (Limit:475.0 mg to 525.0 mg)	
4.0	Uniformity of fill Weight	±7.5% of average fill weight	
5.0	Disintegration Time	NMT 30 minutes in 37°C ± 2°C	
6.0 Assay: Each Hard Gelatin Capsules contains:			
6.1	Carbonyl Iron Eq. to Elemental Iron 100mg	90.0% to 110.0% of the labeled claim.	
6.2	Folic Acid BP 500mcg	NLT 90% of the labeled claim	
6.3	Cyanocobalamin BP 15mcg	NLT 90% of the labeled claim	
6.4	Ascorbic Acid BP 75mg	NLT 90% of the labeled claim	
6.5	Zinc Sulphate monohydrate BP 61.8mg (eq. to elemental zinc 22.5mg	NLT 90% of the labeled claim	
6.6	Alpha Tocopheryl Acetate Concentrate 50% BP 15IU	NLT 90% of the labeled claim	
6.7	Sodium selenite Eq. to Selenium 65mcg	NLT 90% of the labeled claim	

Comments:

QA-Sign & Date:

7.3 TEST DATA FOR CAPSULE FILLING STAGE: (COMPOSITE SAMPLE)

CRITICAL PARAMETER-4 : 2ND BATCH		2ND B.No:	TEST RESULTS
S.No	**MEASURED PARAMETERS**	**ACCEPTANCE CRITERIA**	
1.0	**Appearance**	Red/Red coloured '0' size GHPL printed on both body and cap Hard gelatin capsule Filled with pale green colour granular powder.	
2.0	**Average weight of a capsule**	595mg ± 3.0% (Limit: 577.150 mg to 612.850 mg)	
3.0	**Net fill weight**	500 mg ± 3.0% (Limit:475.0 mg to 525.0 mg)	
4.0	**Uniformity of fill Weight**	±7.5% of average fill weight	
5.0	**Disintegration Time**	NMT 30 minutes in 37°C ± 2°C	
6.0 Assay: Each Hard Gelatin Capsules contains:			
6.1	**Carbonyl Iron Eq. to Elemental Iron 100mg**	90.0% to 110.0% of the labeled claim.	
6.2	**Folic Acid BP 500mcg**	NLT 90% of the labeled claim	
6.3	**Cyanocobalamin BP 15mcg**	NLT 90% of the labeled claim	
6.4	**Ascorbic Acid BP 75mg**	NLT 90% of the labeled claim	
6.5	**Zinc Sulphate monohydrate BP 61.8mg (eq. to elemental zinc 22.5mg**	NLT 90% of the labeled claim	
6.6	**Alpha Tocopheryl Acetate Concentrate 50% BP 15IU**	NLT 90% of the labeled claim	
6.7	**Sodium selenite Eq. to Selenium 65mcg**	NLT 90% of the labeled claim	

Comments:

QA-Sign & Date:

7.4 TEST DATA FOR CAPSULE FILLING STAGE: (COMPOSITE SAMPLE)

CRITICAL PARAMETER-4 : 3RD BATCH		3RD B.No:	TEST RESULTS
S.No	**MEASURED PARAMETERS**	**ACCEPTANCE CRITERIA**	
1.0	**Appearance**	Red/Red coloured '0' size GHPL printed on both body and cap Hard gelatin capsule Filled with pale green colour granular powder.	
2.0	**Average weight of a capsule**	595mg ± 3.0% (Limit: 577.150 mg to 612.850 mg)	
3.0	**Net fill weight**	500 mg ± 3.0% (Limit:475.0 mg to 525.0 mg)	
4.0	**Uniformity of fill Weight**	±7.5% of average fill weight	
5.0	**Disintegration Time**	NMT 30 minutes in 37°C ± 2°C	
6.0 Assay: Each Hard Gelatin Capsules contains:			
6.1	**Carbonyl Iron Eq. to Elemental Iron 100mg**	90.0% to 110.0% of the labeled claim.	
6.2	**Folic Acid BP 500mcg**	NLT 90% of the labeled claim	
6.3	**Cyanocobalamin BP 15mcg**	NLT 90% of the labeled claim	
6.4	**Ascorbic Acid BP 75mg**	NLT 90% of the labeled claim	
6.5	**Zinc Sulphate monohydrate BP 61.8mg (eq. to elemental zinc 22.5mg**	NLT 90% of the labeled claim	
6.6	**Alpha Tocopheryl Acetate Concentrate 50% BP 15IU**	NLT 90% of the labeled claim	
6.7	**Sodium selenite Eq. to Selenium 65mcg**	NLT 90% of the labeled claim	
Comments:			
QA-Sign & Date:			

16.0 CONCLUSION ON VALIDATION OF CAPSULE FILLING STAGES OF COMMERCIAL BATCHES

S.No	Observation	1ST B.No :	2ND B.No:	3RD B.No:
1.	All the validation test results of capsule filling stage are found to be satisfactory during Initial, Middle and Final stage.	Complies/Does not comply	Complies/Does not comply	Complies/Does not comply
2.	All the validation test results of capsule filling stage are found to be satisfactory during RPM challenge.	Complies/Does not comply	Complies/Does not comply	Complies/Does not comply
3.	All the validation test results of capsule filling stage are found to be satisfactory during hopper level challenge.	Complies/Does not comply	Complies/Does not comply	Complies/Does not comply

Overall Remarks on Validation of Compression Process: (Mention details of Deviations/Non-Conformance/Abnormalities if any)

QA:_____
(Sign & Date)

Head-Quality Assurance:_____
(Sign & Date)

Note: If the test results are not found satisfactory, raise unplanned deviation. Necessary corrective actions and preventive actions shall be taken as per SOP. Repeat the complete process validation on next 3 consecutive batches.

17.0 DEVIATIONS:

18.0 EVALUATION OF RESULTS, CONCLUSION AND RECOMMENDATIONS:

Head-Quality Assurance:_____
(Sign & Date)

19.0 REPORT APPROVAL

19.1 Compiled By :

Dept.	Name	Designation	Signature	Date
Quality Assurance				

19.2 Verified By:

Dept.	Name	Designation	Signature	Date
Head-Production				
Head-Quality Control				

19.3 Approved By:

Dept.	Name	Designation	Signature	Date
Head-Quality Assurance				

PROCESS VALIDATION PROTOCOL CUM REPORT

FOR

CARBONYL IRON, VITAMINS, ZINC AND ANTIOXIDANTS CAPSULES

Safetab Life Science,
Plot No.A-67 to 72, PIPDIC Electronic Park, Thirubuvanai,
Puducherry–605107. Phone: 91-413-2641099/2641199
E-mail: info@safetab.net

1.0 PROTOCOL APPROVAL :

1.1 Prepared By :

Dept.	Name	Designation	Signature	Date
Quality Assurance	P. Vadivel	Sr. Executive QA	P. Vadivel	16/02/2023

1.2 Verified By:

Dept.	Name	Designation	Signature	Date
Head-Production	G. Vijayalakshmi	Sr. Manager	Vijayalakshmi	15/02/23
Head-Quality Control	M. Vijayakumar	AGM	[illegible]	15/02/23

1.3 Approved By:

Dept.	Name	Designation	Signature	Date
Head-Quality Assurance	A. G. KANNAN	GM-QA	A. [illegible]	16/02/2023

2.0 PURPOSE:

To establish that the manufacturing process blending validation of Carbonyl Iron, Vitamins, Zinc and Antioxidants capsules will meet the predetermined specifications and quality attributes consistently.

3.0 SCOPE:

This protocol is applicable for the manufacturing and sampling of validation batches of Carbonyl Iron, Vitamins, Zinc and Antioxidants capsules with a batch size of 13, 50,000. In case data obtained from validation batches seem to be inadequate, further extension of the validation batches shall be done. For further confidence of efficacy and fitness till its assigned shelf life, these three batches shall be charged for both Long term and Accelerated stability study.

4.0 RESPONSIBILITIES OF VALIDATION TEAM:

Validation Team	Responsibilities
Quality Assurance	1) Defining the manufacturing process and process parameters that impact the quality, safety, purity and efficacy of the product based on the knowledge gained through process validation.
	2) To ensure pre-requisite requirements are completed before proceeding for Process validation.
	3) Preparation of Process validation Protocol cum report.
	4) In-process monitoring and assurance of quality. Withdrawal of samples as per the sampling plan defined in this protocol.
	5) Review of batch records, analytical reports, compilation of data, evaluation of results and Process validation report.
	6) Reviewing and approving investigations and CAPA for deviations from defined manufacturing process and Process Validation protocol.
Production	1) Review of Process Validation protocol cum report.
	2) Execution of process as per the batch record and Process validation protocol and relevant operating procedures.
	3) Co-ordination with Quality Assurance for sampling.
	4) Investigating any deviations from defined manufacturing process and Process Validation protocol and identifying CAPA.
Quality Control	1) Review of Process validation protocol cum report.
	2) Testing the samples drawn during Process validation study and compilation of results.
Engineering	1) Providing necessary utility as per the product requirement.
	2) Ensuring calibration of measuring devices available on process equipment and utilities and maintenance of processing Equipments.
Head Quality Assurance	1) Approval of Protocol cum report. 2) To review and approve the investigations and CAPA for deviations from defined manufacturing process and protocol. 3) To take decision on further release and distribution of validation batches.

5.0 ACCEPTANCE CRITERIA:

All the product quality parameters must comply within the acceptance criteria as specified in this protocol.

6.0 PROCEDURE:

Execute three batches as per Master Formula Record and Batch Manufacturing Record. Record the critical parameters of the manufacturing unit operations as described in this protocol and compile subsequent test report. Raise deviation as per ST/QA/005. If any abnormalities found during the process validation. Necessary corrective actions and preventive actions shall be taken as per SOP No.: ST/QA/043 before proceeding to validation of commercial batches.

7.0 PRODUCT DETAILS:

Product Name : CARBONYL IRON, VITAMINS, ZINC AND ANTIOXIDANTS CAPSULES			
BRAND NAME:	RICHFER	RICHFER	RICHFER
Batch No :	GIT230211	GIT230212	GIT230222
Batch Size :	13.5L	13.5L	13.5L
Mfg. Date :	02/2023	02/2023	02/2023
Expiry Date :	01/2026	01/2026	01/2026

Product Name	Carbonyl Iron, Vitamins, Zinc and Antioxidants capsules
Label Claim	Each hard Gelatin Capsule contains: Carbonyl Iron Equivalent to Elemental Iron 100mg Folic acid BP 500mcg Cyanocobalamin (coated) 15mcg (Vitamin B12) Ascorbic Acid (coated) 75mg Zinc sulphate Monohydrate BP 61.8mg (Equivalent to Elemental Zinc 22.5mg) Alpha Tocopheryl Acetate BP 15 IU Sodium Selenate Equivalent to Selenium 65mcg Approve colours used in empty hard gelatin capsule. Appropriate overages of Vitamins are added to compensate the loss on storage.
Shelf life	36 Months
Storage Condition	Store in cool and dry place, Keep away from light and moisture.
Batch Size	13,50,000 Capsules
Therapeutic Use	Carbonyl iron is used to treat or prevent iron deficiency and iron deficiency anaemia. This medication is a multivitamin product used to treat or prevent vitamin deficiency due to poor diet, certain illnesses, or during pregnancy. Vitamins are important building blocks of the body and help keep you in good health.
Product Pack	Printed Foil: 160mm blister aluminum foil (0.025mm thickness). Base Foil: 164mm PVDC clear foil.
Pack Style	3 x 10's blister pack

8.0 REFERENCE DOCUMENTS FOR METHOD OF MANUFACTURING AND TESTING:

S.No.	NAME OF THE DOCUMENT	DOCUMENT NUMBER
1	Master Formula Record	ST/MFC/135/R1
2	Batch Manufacturing Record	STBMR:452/00
3	Product specifications and Test Procedure	IMSR00221-00 IMTR00221-00

9.0 REASON FOR VALIDATION:

Reasons	Tick in the appropriate row	Reasons	Tick in the appropriate row
New formulation	✓	Significant changes in process	NA
Change in formulation	NA	Change/modification in equipment	NA
Change in location	NA	Change in batch size	NA
Change in vendor of API	NA	Any other reasons (specify)	NA

10.0 BILL OF RAW MATERIALS : ACTIVE PHARMACEUTICAL INGREDIENTS

S. No	Name of the Ingredients	Material Code	Label claim per tablet in mg	Spec	Overages	Total Qty (Kg)	Approved Vendor
1	Carbonyl Iron	RMAC0073	100.000	USP	Nil	135.0000	PARAS ORGANICS PVT.LTD
2	Folic Acid	RMAF0018	500.000 mcg	BP	20	0.810	MCCOY DRUGS PVT.LTD
3	Cyanocobalamin	RMAC0066	15mcg	BP	50	30.375gm	HEBEI YUXING PHARMACEUTICAL

S. No	Name of the Ingredients	Material Code	Label claim per tablet in mg	Spec	Overages	Total Qty (Kg)	Approved Vendor
4	Ascorbic Acid	RMAA0029	75.000	BP	20	121.500	BAJAJ HEALTHCARE LTD
5	Zinc Sulfate Monohydrate	RMAZ0009	61.800	BP	20	100.116	SHREEJI INDUSTRIES
6	Alpha Tocopheryl Acetate	RMAA0030	15 IU	BP	20	48.600	EMMER CHEM/SHREENATH
7	Sodium Selenate	RMAS0028	65 mcg	IH	25	262.500gm	SNA HEALTHCARE

* Quantity varies based on Potency Calculation

INDENT OF EXCIPIENTS:

S.No	Name of the Ingredients	Material Code	Unit dose per tablet in mg	Spec	Total Qty (Kg)	Approved Vendor
8	Hydrophobic Colloidal anhydrous silica	RMEC0017	3.000	BP	4.050	WACKER
9	Microcrystalline crystalline cellulose PH 102	RMEM0038	166.022	BP	224.127	DFE
10	Calcium hydrogen phosphate	RMED0015	10.000	BP	13.500	INNOPHOS,INDIA PHOSPHATE
11	Purified Talc	RMET0012	10.000	BP	13.500	NEELKANTH
12	Magnesium stearate	RMEM0033	10.000	BP	13.500	NITIKA

EMPTY HARD GELATIN CAPSULE

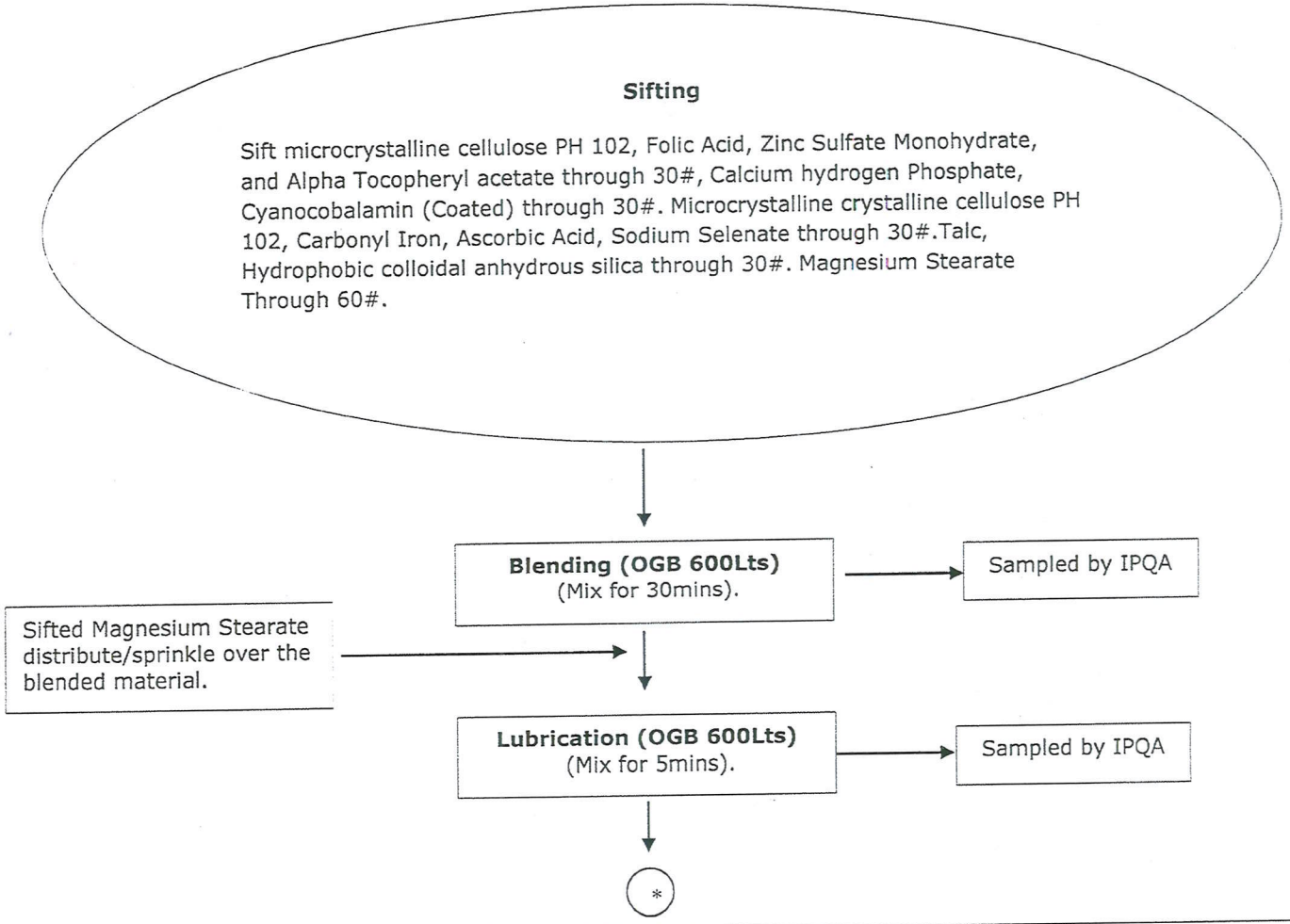
S. No	Name of the Ingredients	Material Code	Spec	Overages	Total Qty (Kg)	Vendor
1	"0" Size Red/Red hard gelatin capsule(GHPL Printed)	RMER0012	IHS	NIL	1363500	ERAWAT PHARMA

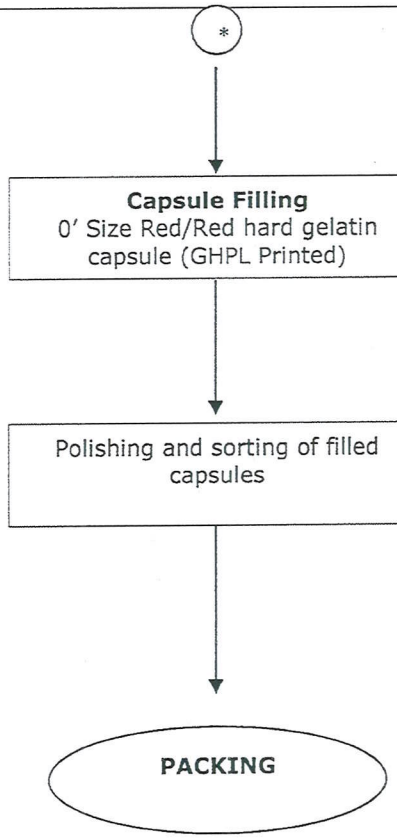
11.0 EQUIPMENT DETAILS:

Table 1: List of major process equipment to be used in the manufacturing:

SR. NO.	EQUIPMENT	MAKE	EQUIPMENT NO.
1.0	Weighing Balances	ESSAE TERAOKA	ST/SRWB/001, ST/SRWB/002, ST/WB/189, ST/PRWB/002, ST/WB/205, ST/WB/202 or ST/WB/207
2.0	Vibro Sifter	GEM Pharma	ST/PRG/006, ST/PRG/007, ST/PRG/008,
4.0	Octagonal blender (2200lts)	SRI KARPAGA VINAYAKA	ST/PROB/001

12.0 PROCESS FLOW CHART





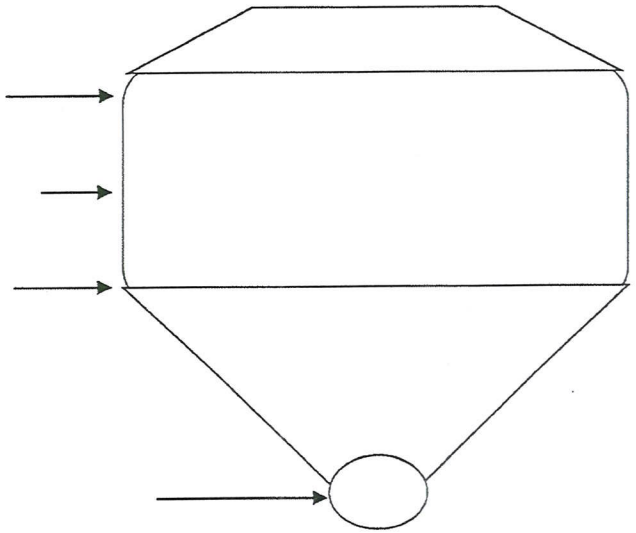
13.0 CRITICAL PROCESS STAGES TO BE VALIDATED:

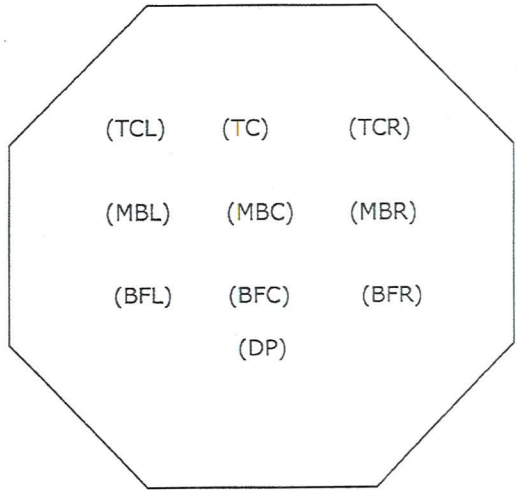
13.1 BLENDING AND LUBRICATION STAGE:

BLENDING AND LUBRICATION PROCEDURE (Refer MFR/BMR more details)	CRITICAL PARAMETER TO BE VALIDATED	SAMPLING PROCEDURE
Step-1 Sift microcrystalline cellulose PH 102, Folic Acid, Zinc Sulfate Monohydrate, and Alpha Tocopheryl acetate through 30#, Calcium hydrogen Phosphate, Cyanocobalamin (Coated) through 30#. Microcrystalline crystalline cellulose PH 102, Carbonyl Iron, Ascorbic Acid, Sodium Selenate through 30#.Talc, Hydrophobic colloidal anhydrous silica through 30#. Magnesium Stearate Through 60#. Mix for 30mins. Step - 2 Sifted Magnesium Stearate distribute/sprinkle over the blended material. (Mix for 5mins).	1. Mixing time **(Pre-lubricated blend uniformity)** 2. Mixing time **(Lubricated blend uniformity)**	**Step- 1: PRE - LUBRICATION:** Samples shall be withdrawn from 10 different locations Collect approximately 2 g of blend sample location from top, middle and bottom level of the Octagonal blender (as per sampling diagram 13.2) separately by using sampling thief after **30 minutes** mixing. Use these samples for blend uniformity test as per 14.1.1.1 **Step- 2: AFTER LUBRICATION:** Samples shall be withdrawn from 10 different locations Collect approximately 2 g of lubrication blend sample location from top, middle and bottom level of the Octagonal blender (as per sampling diagram 13.2) separately using sampling thief after **5 minutes** mixing. Use these samples for blend uniformity test as per 14.1.1.2

13.2 SAMPLING LOCATIONS IN OCTAGONAL BLENDER:

SIDE VIEW





Samples are to be drawn from 10 different positions as follows:

TCL – Top center left
TC - Top center
TCR – Top center right
MBL – Middle back left
MBC – Middle back center
MBR – Middle back right
BFL – Bottom front left
BFC – Bottom front center
BFR – Bottom front right
DP - Discharge port

14.0 TEST PROGRAM AND ACCEPTANCE CRITERIA FOR VALIDATION:

14.1 GRANULATION PROCESS :

S.No.	MEASURED PARAMETERS	ACCEPTANCE CRITERIA	TEST PROCEDURE
14.1.1	**BLENDING & LUBRICATION PROCESS:**		
14.1.1.1	**BLENDING – PRE LUBRICATION:**		
1	**Blend uniformity:**	Individual sample values between (85.0% to 115.0% of label claim) & RSD: NMT 5 % and Average value between (90.0% to 110.0%).	Specification and test procedure no: IMSR00221-00 IMTR00221-00
14.1.1.2	**LUBRICATION:**		
1	**Appearance** (pooled sample)	White colour granular powder	Specification and test procedure no: IMSR00221-00 IMTR00221-00
2	**Blend uniformity:**	Individual sample values between (85.0% to 115.0% of label claim) & RSD: NMT 5 % and Average value between (90.0% to 110.0%).	
3	**Bulk density** (pooled sample)	For information only	NA
4	**Tap density** (pooled sample)	For information only	

15.0 TEST DATA FOR VALIDATION OF BLENDING & LUBRICATION STAGE –1ST ,2ND & 3RD BATCHES

15.1 TEST DATA FOR BLENDING STAGE: 1ST BATCH NO.: 011T230211

S. No	MEASURED PARAMETERS	ACCEPTANCE CRITERIA	SAMPLE LOCATION	TEST RESULTS Mixing time (30 minutes)	
				FOLIC ACID	ALPHA TOCOPHERYL ACETATE
1	**Blend uniformity:**	Individual sample values between 85.0% to 115.0% of label claim & RSD: NMT 5 % and Average value between 90.0% to 110.0%.	**TCL**	120.1	116.4
			TC	119.1	115.8
			TCR	121.6	121.3
			MBL	121.1	118.6
			MBC	122.4	122.4
			MBR	123.0	122.5
			BFL	117.5	116.9
			BFC	117.2	121.1
			BFR	117.3	117.5
			DP	121.6	123.6
			Avg.	120.1	119.6
			RSD	1.8	2.4
			Composite	122.7	118.3

All the validation test results of blending stage are found to be **satisfactory/not satisfactory.**

QA-Sign & Date: 25/02/23

15.1.1 TEST DATA FOR BLENDING STAGE: 2ND BATCH NO.: 01723021 2

S. No	MEASURED PARAMETERS	ACCEPTANCE CRITERIA	SAMPLE LOCATION	TEST RESULTS Mixing time (30 minutes)	
				FOLIC ACID	ALPHA TOCOPHERYL ACETATE
1	**Blend uniformity:**	Individual sample values between 85.0% to 115.0% of label claim & RSD: NMT 5 % and Average value between 90.0% to 110.0%.	TCL	119.3	121.8
			TC	114.0	118.3
			TCR	112.4	115.8
			MBL	106.9	116.8
			MBC	110.1	123.3
			MBR	115.6	117.9
			BFL	109.5	115.3
			BFC	110.8	122.8
			BFR	110.8	118.5
			DP	110.6	118.6
			Avg.	112.0	118.9
			RSD	3.1	2.4
			Composite	110.6	120.4

All the validation test results of blending stage are found to be **satisfactory/not satisfactory.**

QA-Sign & Date: 25/04/23

15.1.2 TEST DATA FOR BLENDING STAGE: 3RD BATCH NO.: 0117230222

S. No	MEASURED PARAMETERS	ACCEPTANCE CRITERIA	SAMPLE LOCATION	TEST RESULTS Mixing time (30 minutes)	
				FOLIC ACID	ALPHA TOCOPHERYL ACETATE
1	**Blend uniformity:**	Individual sample values between 85.0% to 115.0% of label claim & RSD: NMT 5 % and Average value between 90.0% to 110.0%.	**TCL**	137.8	110.1
			TC	126.74	110.1
			TCR	124.2	110.0
			MBL	122.1	108.9
			MBC	122.7	107.0
			MBR	115.6	108.1
			BFL	119.4	112.0
			BFC	129.0	108.6
			BFR	123.4	109.9
			DP	125.0	114.9
			Avg.	124.6	110.0
			RSD	4.8	2.0
			Composite	123.3	114.6

All the validation test results of blending stage are found to be **satisfactory/not satisfactory.**

QA-Sign & Date: 25/02/23

15.2 TEST DATA FOR LUBRICATION STAGE:

S. No	MEASURED PARAMETERS	ACCEPTANCE CRITERIA	SAMPLE LOCATION	TEST RESULTS FOR FOLIC ACID Mixing time (5 minutes)		
				1ST B.NO: 0117230211	2ND B.NO: 0117230212	3RD B.NO: 0117230222
1	Blend uniformity:	Individual sample values between 85.0% to 115.0% of label claim & RSD: NMT 5 % and Average value between 90.0% to 110.0%.	TCL	117.4	111.8	123.5
			TC	117.9	113.2	119.2
			TCR	118.0	110.6	121.6
			MBL	124.6	111.5	121.4
			MBC	119.6	111.6	116.2
			MBR	119.4	111.0	117.8
			BFL	123.1	110.9	117.2
			BFC	126.6	114.2	121.8
			BFR	126.7	110.4	122.0
			DP	120.1	110.4	116.9
			Avg.	121.3	111.6	119.8
			RSD	3.0	1.1	2.2
			Composite	119.1	110.8	119.5

All the validation test results of Lubrication stage are found to be **satisfactory/not satisfactory.**

QA-Sign & Date: 25/04/23

15.2.1 TEST DATA FOR LUBRICATION STAGE:

S. No	MEASURED PARAMETERS	ACCEPTANCE CRITERIA	SAMPLE LOCATION	TEST RESULTS FOR ALPHA TOCOPHERYL ACETATE Mixing time (5 minutes)		
				1ST B.NO: 01172302 11	2ND B.NO: 01172302 12	3RD B.NO: 01172302 22
1	Blend uniformity:	Individual sample values between 85.0% to 115.0% of label claim & RSD: NMT 5 % and Average value between 90.0% to 110.0%.	TCL	107.8	105.9	117.6
			TC	106.7	112.6	114.1
			TCR	109.5	107.7	114.2
			MBL	107.6	111.9	112.9
			MBC	109.2	112.0	114.4
			MBR	109.6	108.1	116.7
			BFL	110.6	104.8	111.3
			BFC	111.3	105.0	111.6
			BFR	108.9	109.9	112.4
			DP	108.1	108.8	118.6
			Avg.	108.9	108.7	114.4
			RSD	1.3	2.7	2.2
			Composite	111.3	109.3	117.1

All the validation test results of Lubrication stage are found to be **satisfactory/not satisfactory.**

QA-Sign & Date: 25/04/23

15.3 TEST DATA FOR LUBRICATION STAGE :

S.No	MEASURED PARAMETERS	ACCEPTANCE CRITERIA	ON POOLED SAMPLE TEST RESULTS 1ST Batch No.: GT/7230211
1	Appearance	White colour granular powder	Complies
2	Bulk Density	For information only	0.67g/ml
3	Tapped Density	For information only	0.91g/ml
4	PARTICLE SIZE OF RETAINS:		
	1. #20 Mesh 2. #30 Mesh 3. #40 Mesh 4. #60 Mesh 5. #80 Mesh 6. #100 Mesh	For information only	NIL NIL 0.66% 5.15% 47.14% 9.91%
	Particle size of passing:		
5	1. #100 Mesh	For information only	34.95%

* For first batch only: After 5 minutes mixing of blend, collect a pooled sample - about 250g total from three different sampling locations viz; top, middle and bottom of the octagonal blender, use this pooled sample for evaluation of physical parameters.

QA-Sign & Date: 23/02/23

15.4 CONCLUSION ON VALIDATION OF BLENDING & LUBRICATION STAGE OF 1ST,2ND & 3RD BATCH

1. All the validation test results of Blending stage of Carbonyl Iron, Vitamins, Zinc and Antioxidants capsules are found to be **Satisfactory/Not Satisfactory** after **30 Minutes** Mixing.

2. All the validation test results of Lubrication stage of Carbonyl Iron, Vitamins, Zinc and Antioxidants capsules are found to be **Satisfactory/Not Satisfactory** after **5 Minutes** Mixing.

S.No	Process stage	Equipment	Fixed Standard (minutes)
1	Blending stage	Octagonal Blender	30 minutes
2	Lubrication stage	Octagonal Blender	5 minutes

Head-Quality Assurance: 25/04/23
(Sign & Date)

Note: If the test results are not found satisfactory raise unplanned deviation. Necessary corrective actions and preventive actions shall be taken before proceeding to validation of commercial batches.

7.0 TEST DATA FOR CAPSULE FILLING STAGE : (Initial, Middle, Final) 1ST,2ND& 3RD BATCH

7.1 TEST DATA FOR CAPSULE FILLING STAGE :1ST BATCH

1ST B.No: G/17230211

CRITICAL PARAMETER-1: 1ST BATCH			TEST RESULTS		
S.No	MEASURED PARAMETERS	ACCEPTANCE CRITERIA	Initial stage	Middle stage	Final stage
1.0	Appearance	Red/Red coloured '0' size GHPL printed on both body and cap Hard gelatin capsule Filled with pale green colour granular powder.	complies	complies	complies
2.0	Average weight of a capsule	595mg ± 3.0% (Limit: 577.150 mg to 612.850 mg)	597.4mg	595.2mg	598.3mg
3.0	Net fill weight	500 mg ± 3.0% (Limit:475.0 mg to 525.0 mg)	498.9mg	493.5mg	499.8mg
4.0	Uniformity of fill Weight	±7.5% of average fill weight	complies	complies	Complies.
5.0	Disintegration Time	NMT 30 minutes in 37°C ± 2°C	06 minutes 02 seconds	08 minutes 30 seconds	10 minutes 09 seconds.
6.0 Assay: Each Hard gelatin Capsule contains:					
6.1	Folic Acid BP 500mcg	NLT 90% of the labeled claim	602.30 mcg (120.5%)	604.50 mcg (120.9%)	603.80 mcg (120.8%)
6.2	Alpha Tocopheryl Acetate Concentrate 50% BP 15IU	NLT 90% of the labeled claim	20.25 IU (135.0%)	19.80 IU (132.0%)	18.20 IU (121.3%)

Comments: The above mentioned capsules filling (Initial, middle and Final stage) parameters, Assay, has been verified and found complies within the Acceptance criteria.

QA-Sign & Date: 28/02/23

7.1.1 TEST DATA FOR CAPSULE FILLING STAGE :2ND BATCH — 2nd B.No: G1172302 12

CRITICAL PARAMETER-1: 2ND BATCH			TEST RESULTS		
S.No	**MEASURED PARAMETERS**	**ACCEPTANCE CRITERIA**	**Initial stage**	**Middle stage**	**Final stage**
1.0	**Appearance**	Red/Red coloured '0' size GHPL printed on both body and cap Hard gelatin capsule Filled with pale green colour granular powder.	Complies	Complies	Complies.
2.0	**Average weight of a capsule**	595mg ± 3.0% (Limit: 577.150 mg to 612.850 mg)	594.8mg	596.4mg	598.3mg
3.0	**Net fill weight**	500 mg ± 3.0% (Limit:475.0 mg to 525.0 mg)	493.7mg	495.5mg	497.3mg
4.0	**Uniformity of fill Weight**	±7.5% of average fill weight	Complies	Complies	Complies
5.0	**Disintegration Time**	NMT 30 minutes in 37°C ± 2°C	05 minutes 52 Seconds	06 minutes 20 Seconds	5 minutes 12 seconds
6.0 Assay: Each Hard gelatin Capsule contains:					
6.1	**Folic Acid BP 500mcg**	NLT 90% of the labeled claim	568.84mcg (113.8%)	602.30mcg (120.5%)	600.40 mcg (120.1%)
6.2	**Alpha Tocopheryl Acetate Concentrate 50% BP 15IU**	NLT 90% of the labeled claim	19.59IU (130.6%)	19.24IU (128.3%)	21.15IU (141.0%)

Comments: The above mentioned capsules filling parameters, Assay has been verified and found complies within the acceptance criteria.

QA-Sign & Date: 20/02/23

7.1.2 TEST DATA FOR CAPSULE FILLING STAGE :3RD BATCH — **3rd B.No:** G117230222

CRITICAL PARAMETER-1: 3RD BATCH			TEST RESULTS		
S.No	**MEASURED PARAMETERS**	**ACCEPTANCE CRITERIA**	**Initial stage**	**Middle stage**	**Final stage**
1.0	**Appearance**	Red/Red coloured '0' size GHPL printed on both body and cap Hard gelatin capsule Filled with pale green colour granular powder.	Complies	Complies	Complies
2.0	**Average weight of a capsule**	595mg ± 3.0% (Limit: 577.150 mg to 612.850 mg)	590.5mg	594.8mg	592.3mg
3.0	**Net fill weight**	500 mg ± 3.0% (Limit:475.0 mg to 525.0 mg)	492.8mg	494.0mg	496.8mg
4.0	**Uniformity of fill Weight**	±7.5% of average fill weight	Complies	Complies	Complies
5.0	**Disintegration Time**	NMT 30 minutes in 37°C ± 2°C	06 minutes 20 seconds	07 minutes 15 seconds	06 minutes 09 seconds.
6.0 Assay: Each Hard gelatin Capsule contains:					
6.1	**Folic Acid BP 500mcg**	NLT 90% of the labeled claim	594.11mcg (118.8%)	598.16mcg (119.7%)	601.12mcg (120.2%)
6.2	**Alpha Tocopheryl Acetate Concentrate 50% BP 15IU**	NLT 90% of the labeled claim	20.69IU (139.9%)	19.22IU (128.1%)	19.30IU (128.7%)

Comments: The above mentioned capsules filling parameters, Assay has been verified and found. Complies with in the acceptance criteria.

QA-Sign & Date: 25/Feb/23

7.2 TEST DATA FOR CAPSULE FILLING STAGE: (COMPOSITE SAMPLE)

CRITICAL PARAMETER-4 : 1ST BATCH **1ST B.No:**

S.No	MEASURED PARAMETERS	ACCEPTANCE CRITERIA	TEST RESULTS
1.0	Appearance	Red/Red coloured '0' size GHPL printed on both body and cap Hard gelatin capsule Filled with pale green colour granular powder.	Complies
2.0	Average weight of a capsule	595mg ± 3.0% (Limit: 577.150 mg to 612.850 mg)	596.6mg
3.0	Net fill weight	500 mg ± 3.0% (Limit:475.0 mg to 525.0 mg)	499.9mg
4.0	Uniformity of fill Weight	±7.5% of average fill weight	(-)2.04% (+)2.38%
5.0	Disintegration Time	NMT 30 minutes in 37°C ± 2°C	05 minutes 52 Seconds.
6.0 Assay: Each Hard Gelatin Capsules contains:			
6.1	Carbonyl Iron Eq. to Elemental Iron 100mg	90.0% to 110.0% of the labeled claim.	99.37mg (99.4%)
6.2	Folic Acid BP 500mcg	NLT 90% of the labeled claim	597.09mcg (119.4%)
6.3	Cyanocobalamin BP 15mcg	NLT 90% of the labeled claim	22.1mcg (147.3%)
6.4	Ascorbic Acid BP 75mg	NLT 90% of the labeled claim	86.7mg (115.6%)
6.5	Zinc Sulphate monohydrate BP 61.8mg (eq. to elemental zinc 22.5mg	NLT 90% of the labeled claim	24.59mg (109.3%)
6.6	Alpha Tocopheryl Acetate Concentrate 50% BP 15IU	NLT 90% of the labeled claim	20.05IU (133.7%)
6.7	Sodium selenite Eq. to Selenium 65mcg	NLT 90% of the labeled claim	72.37mcg (111.3%)

Comments: The above mentioned capsules filling parameters, Assay has been verified and found complies within the acceptance criteria.

QA-Sign & Date: PS 25/02/23

7.3 TEST DATA FOR CAPSULE FILLING STAGE: (COMPOSITE SAMPLE)

CRITICAL PARAMETER-4 : 2ND BATCH **2ND B.No:** G117230212

S.No	MEASURED PARAMETERS	ACCEPTANCE CRITERIA	TEST RESULTS
1.0	Appearance	Red/Red coloured '0' size GHPL printed on both body and cap Hard gelatin capsule Filled with pale green colour granular powder.	complies
2.0	Average weight of a capsule	595mg ± 3.0% (Limit: 577.150 mg to 612.850 mg)	595.3mg
3.0	Net fill weight	500 mg ± 3.0% (Limit:475.0 mg to 525.0 mg)	499.6mg
4.0	Uniformity of fill Weight	±7.5% of average fill weight	(−) 0.06% (+) 5.76%
5.0	Disintegration Time	NMT 30 minutes in 37°C ± 2°C	05 minutes 45 seconds
6.0 Assay: Each Hard Gelatin Capsules contains:			
6.1	Carbonyl Iron Eq. to Elemental Iron 100mg	90.0% to 110.0% of the labeled claim.	101.30mg (101.3%)
6.2	Folic Acid BP 500mcg	NLT 90% of the labeled claim	593.13mcg (118.6%)
6.3	Cyanocobalamin BP 15mcg	NLT 90% of the labeled claim	24.4 mcg (162.7%)
6.4	Ascorbic Acid BP 75mg	NLT 90% of the labeled claim	86.6mg (115.4%)
6.5	Zinc Sulphate monohydrate BP 61.8mg (eq. to elemental zinc 22.5mg	NLT 90% of the labeled claim	24.65mg (109.6%)
6.6	Alpha Tocopheryl Acetate Concentrate 50% BP 15IU	NLT 90% of the labeled claim	20.12 IU (134.1%)
6.7	Sodium selenite Eq. to Selenium 65mcg	NLT 90% of the labeled claim	72.38 mcg (111.4%)

Comments: The above Mentioned Capsule filling parameters, Assay has been verified and found Complies within the Acceptance Creteria.

QA-Sign & Date: 28/02/23

7.4 TEST DATA FOR CAPSULE FILLING STAGE: (COMPOSITE SAMPLE)

CRITICAL PARAMETER-4 : 3RD BATCH **3RD B.No:** GH1723022 2

S.No	MEASURED PARAMETERS	ACCEPTANCE CRITERIA	TEST RESULTS
1.0	Appearance	Red/Red coloured '0' size GHPL printed on both body and cap Hard gelatin capsule Filled with pale green colour granular powder.	Complies
2.0	Average weight of a capsule	595mg ± 3.0% (Limit: 577.150 mg to 612.850 mg)	593.9mg
3.0	Net fill weight	500 mg ± 3.0% (Limit:475.0 mg to 525.0 mg)	497.1mg
4.0	Uniformity of fill Weight	±7.5% of average fill weight	(−) 3.90% (+) 2.01%
5.0	Disintegration Time	NMT 30 minutes in 37°C ± 2°C	05 minutes 45 seconds
6.0 Assay: Each Hard Gelatin Capsules contains:			
6.1	Carbonyl Iron Eq. to Elemental Iron 100mg	90.0% to 110.0% of the labeled claim.	103.47mg (103.5%)
6.2	Folic Acid BP 500mcg	NLT 90% of the labeled claim	607.73 mcg (121.5%)
6.3	Cyanocobalamin BP 15mcg	NLT 90% of the labeled claim	24.15 mcg (161.0%)
6.4	Ascorbic Acid BP 75mg	NLT 90% of the labeled claim	75.81 mg (101.1%)
6.5	Zinc Sulphate monohydrate BP 61.8mg (eq. to elemental zinc 22.5mg	NLT 90% of the labeled claim	25.71mg (114.3%)
6.6	Alpha Tocopheryl Acetate Concentrate 50% BP 15IU	NLT 90% of the labeled claim	21.62IU (144.1%)
6.7	Sodium selenite Eq. to Selenium 65mcg	NLT 90% of the labeled claim	74.18 mcg (118.7%)

Comments: The above Mentioned capsules filling parameters, Assay has been verified and found complies within the Acceptance criteria.

QA-Sign & Date: 25/04/23

16.0 CONCLUSION ON VALIDATION OF CAPSULE FILLING STAGES OF COMMERCIAL BATCHES

S.No	Observation	1ST B.No :	2ND B.No:	3RD B.No:
1.	All the validation test results of capsule filling stage are found to be satisfactory during Initial, Middle and Final stage.	Complies/Does not comply	Complies/Does not comply	Complies/Does not comply
2.	All the validation test results of capsule filling stage are found to be satisfactory during RPM challenge.	Complies/Does not comply	Complies/Does not comply	Complies/Does not comply
3.	All the validation test results of capsule filling stage are found to be satisfactory during hopper level challenge.	Complies/Does not comply	Complies/Does not comply	Complies/Does not comply

Overall Remarks on Validation of Compression Process: (Mention details of Deviations/Non-Conformance/Abnormalities if any)

QA: 25/04/2023
(Sign & Date)

Head-Quality Assurance: 25/04/23
(Sign & Date)

Note: If the test results are not found satisfactory, raise unplanned deviation. Necessary corrective actions and preventive actions shall be taken as per SOP. Repeat the complete process validation on next 3 consecutive batches.

17.0 DEVIATIONS:

NIL

25/04/2023

18.0 EVALUATION OF RESULTS, CONCLUSION AND RECOMMENDATIONS:

Process Validation of carbonyl Iron, Vitamins, Zinc and Anti-oxidants Capsules is carried out with three commercial batches as per pre-approved protocol. Manufacturing Activity was carried out according to the procedure defined in Manufacturing Record from the three commercial batches, Batch no' GIIT230211, GIIT230212 and GIIT230222, process validation In process results and chemical Analysis results are well within the Acceptance Criteria provided in approved protocol.

Based on above Review results of three commercial batches it is concluded that the:

i. Blending
ii) Lubrication,
iii) Capsule filling

Process Validation is controlled and results are found within the specification. Hence Concluded: That the process validation design stands validation for Blending, Lubrication and Capsule filling Initial, middle and final Stage for the product: Carbonyl Iron, Vitamins, Zinc and Antioxidants Capsules (Richfer).

NA

Head-Quality Assurance: PG 25/04/23
(Sign & Date)

19.0 REPORT APPROVAL

19.1 Compiled By :

Dept.	Name	Designation	Signature	Date
Quality Assurance	P. Vadivel	Sr. Executive QA	P. Vadivel	25/04/2023

19.2 Verified By:

Dept.	Name	Designation	Signature	Date
Head-Production	V. Dharabal	Plant Head		26/04/23
Head-Quality Control	M. Vijaya Kumar	DGM		26/04/23

19.3 Approved By:

Dept.	Name	Designation	Signature	Date
Head-Quality Assurance	K. Jayaraj	Asst. Manager - QA		27/04/2023