



Faculty of Engineering
Department of Textile Engineering

REPORT ON

Industrial Attachment

At

Rupashi Knit Wears Ltd.

Lamapara, Kutubpur, Fatullah, Narayanganj



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This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Textile Engineering.

Advance in Apparel Manufacturing Technology

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Declaration

We declare that we complete the report under Abdullah Al Mamun, Asst. Professor, Department of Textile Engineering, Daffodil International University. Also said that is this “Industrial Attachment” has neither have been used before to fulfill of the related purpose nor it will be submitted to any other person or authority in future.

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DAFFODIL INTERNATIONAL UNIVERSITY

DEPT. OF TEXTILE ENGINEERING

APPROVAL SHEET

This report entitled ‘ INDUSTRIAL ATTACHMENT ’ at **Daffodil International University, A. Y. 2014**’ prepared and submitted by **Md.saful Islam, G.M.Alauddin, Mohd. Zabed Chowdhury** in partial fulfillment of the requirement for the degree of **BACHELOR OF SCIENCE IN TEXTILE ENGINEERING** has been examined and hereby recommended for approval and acceptance.

.....

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**DEDICATED
TO
OUR BELOVED PARENTS**



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1.EXECUTIVE SUMMARY

The Industrial Attachment is the most effective way for Textile Engineering student to be achieved the knowledge about the practical field of the Textile Manufacturing. It brings an opportunity to all the learners to enrich their academic knowledge by practicing with the experts of the practical field of textile. The internationally recognized buyers or clients are looking for those countries for producing their apparel products where different types of industries have established as a one stop source for the global apparel market, satisfy and meet customer's expectation by developing and providing product and services on time which offer value in terms of Quality, Low price, Safety & Environmental Impact. And also assure complete compliance with the international quality standard and also provide the employees internationally acceptable working condition Bangladesh. There are varies group of Textile Industries those are producing high quality textile & apparel products. **Rupashi Group** is one of them. **Rupashi Group** has a number of sister concerns in the family. Those are Rupashi Embo World, Rupashi Design & Printing, Rupashi Fabric Complex (pvt.) Ltd, Shoeb Packaging (Bd), Sadia Knit Composite, Shoeb Knit composite. Rupashi Group is one of the biggest knit garments manufacturers & exporters. The have different types of knitting, dyeing, printing, cutting, sewing, finishing & washing process. All the machines, equipments & chemicals used in different process are well branded. They produce various types of knit products for their buyer those are coming from various countries such as North America, South America, Western Europe, Eastern Europe, Eastern Asia, Southeast Asia, Mid East, Africa. They follow all th system for their machines maintenance so production can not hamper. In this report we have tried to give some information about **Rupashi Knit Wears Ltd** and we observed that they are produce high quality Garments and fulfill the requirements of buyers by following various internationally recognized method. So we are highly pleasure for that we had an opportunity to complete our two month internship at **Rupashi Knit wears Ltd.** , which is one of the most modern industries of the country.

2.INTRODUCTION OF THE ORGANIZATION

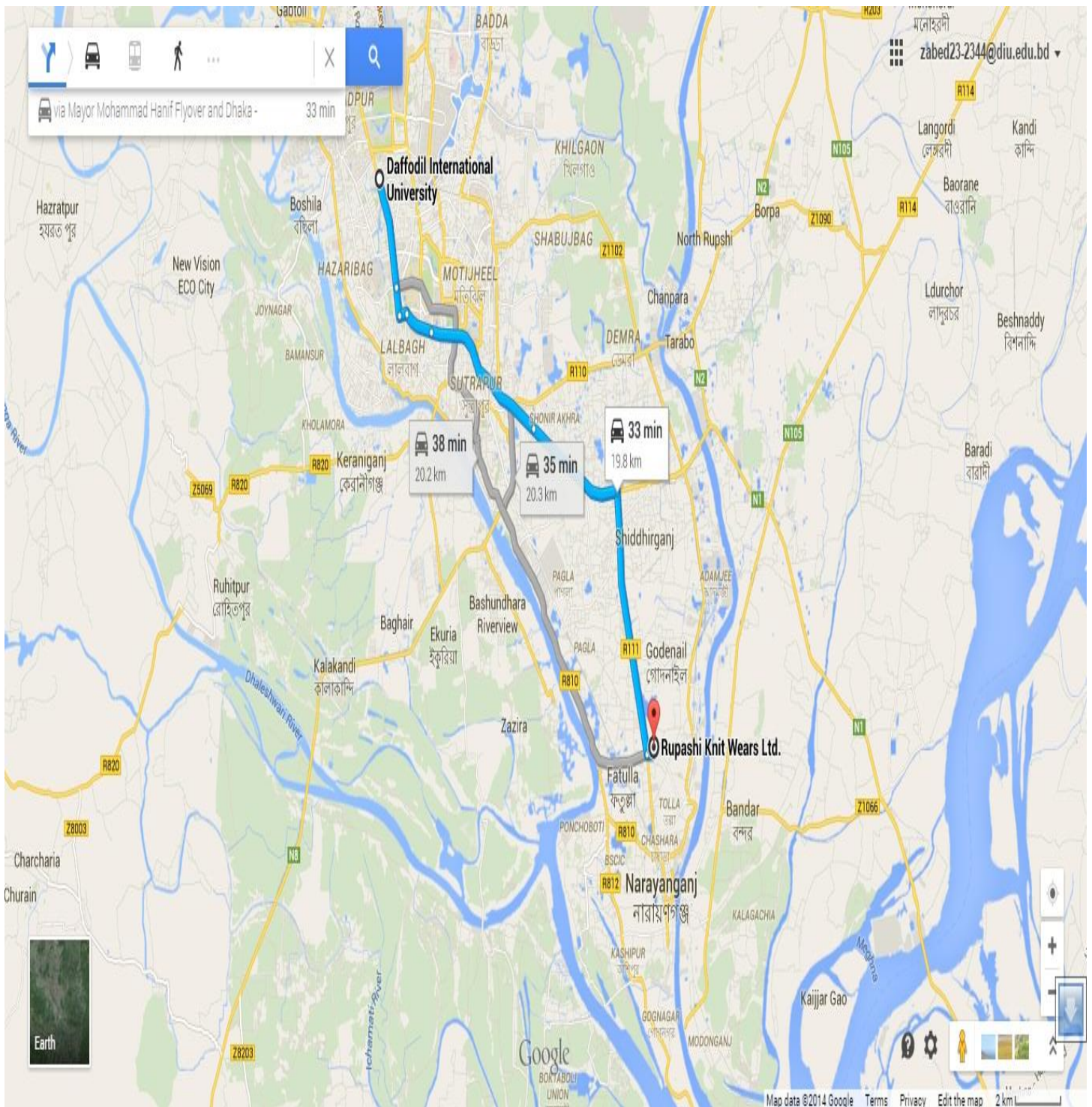


2.1.INTRODUCTION:

Rupashi group is truly integrated undertaking . The RUPASHI GROUP has the capability to after a complete product rang for the export textile markets. The goal of RUPASHI GROUP is to become the preferred partner for scouring high quality fabric and clothing from Bangladesh with highly advance technology and an emphasis on developing local human resources. RUPASHI GROUP has the potential to make an important contribution to the nation s growing ready made garments export sector. The rational behind the existing structure and future expansion of RUPASHI GROUP is to capture value added at each stage of textile manufacturing process .Deposits Bangladesh's lack of indigenou cotton production capability , RUPASHI GROUP has leveraged Bangladesh's labor cost advantage and export competitiveness to the maximum .The industrial attachment is the process ,which builds understanding ,skills and attitude of the performer ,which improves his knowledge in boosting productivity and services. University education provides us vast theoretical knowledge as well as more practical attachment ,in despite of all these industrial attachment help us to be familiars with technical support of modern machinery ,skills about various processing stage .It also provides us efficient practical knowledge about production management ,work study ,efficiency ,industrial management, purchasing ,utility ,and maintenance of machinery and their operation techniques etc. the above mention can not be achieved successfully by means of theoretical knowledge only. This is why it should be accomplished with practical knowledge in which it is based on. Industrial attachment makes us reliable to be accustomed with industrial atomsphere and improve courage and inspiration to take self responsibility with RUPASHI GROUP. Textile education can't be completed without industrial training. Because this industrial training minimizes the gap between theoretical and practical knowledge and make us accustomed to industrial environment. I got an opportunity to complete two-months long industrial training at **Rupashi Knit wear Ltd (Rupashi Group)** , which is a export-oriented composite Knit Dyeing Industry. It has well planned & equipped fabric dyeing-finishing and garments units in addition to facilitate knitting and knitwear manufacturing.

2.2.LOCATION MAP : RUPASHI KNIT WEARS LTD.

Daffodil International University to Rupashi Knit Wears Ltd.



2.3.HISTORY BACKGROUND OF RUPASHI GROUP:

After successful operation in Rupashi Knit Wear Ltd(Rupashi Group) the owner had decided to start a fully information & technology based along with the social accountability and quality controlled modern ready made composite knit garments industry in large scale. In this connection, the investor had decided in a resolution to start a company in ,Lamapara, Kutubpur, Fattulla, Narayangonj. In the year 1993 to manufacture knitwear garments for the international market. Right from inception the policy of the company has been to provide total customer satisfaction by offering quality knitwear in time. To meet the commitments of quality and prompt delivery, Rupashi Knit Wear Ltd Decided to integrate the manufacturing process in a planned manner. Over the years the entire process has been integrated by importing sophisticated machinery from world-renowned manufacturers. Working on new concepts in styling & content of the knitwear is a continuous activity in Rupashi Knit Wear Ltd with an objective to up the quality and the value of merchandise. Rupashi Knit Wear Ltd (RupashiGroup). Concentrated all its strengths and resources in developing a wide range of knitwear for the international market.

Rupashi group concerns :

RUPASHI GROUP is mainly a company of ready made garments ,engaged in manufacturing and exporting of knit apparels since 1993.

Textile industries :

- Rupashi knit composite ltd
- Rupashi knit wear ltd(dyeing division)
- Shoeb knit composite
- Salman knit composite

Garments industries :

- Rupashi fabric complex (pvt.)
- Sadia knit wear ltd

- Salman knit wear ltd

Garments Accessories:

- Shoeb packagine (Bd)
- Rupashi fabric complex (pvt.)ltd -(poly bag division).

2.4.AT A GLANCE

Name of Company : **RUPASHI Knit Wars LTD**

Year of establishment : 1993

Factory and Office Address: Lamapara, Kutubpur, Futullah ,Narayanganaj
Bangladesh

Telephone :880-2-7647175,7645837,7635174

Fax:880-2-7641873

Email : rupashi@rupashigroup.com

Area of Factory : 40 Bigha

Total Investments of Factory in TK: **650+ Core(approximately)**

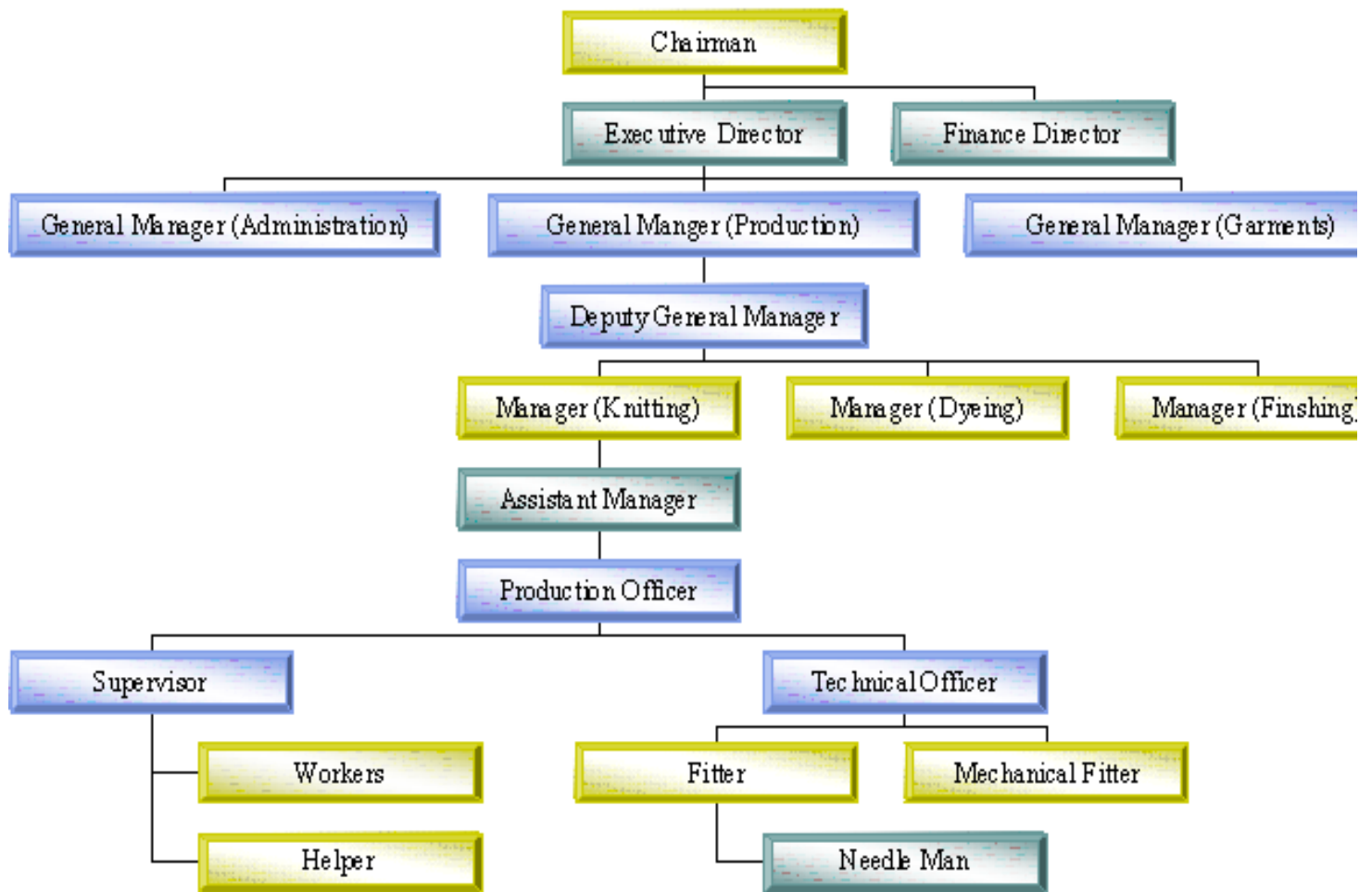
Name and Bank Address : SONALI BANK LTD.

Narayanganj branch ,Narayanganj

Bangladesh

100% EXPORT ORENTED GARMENTS

2.5.ORGANOGRAM OF RUPASHI KNIT WEARS LTD.



Total Employees: 3998 persons

Knitting Section : 300

Dyeing Section: 277

Printing section :120

Garments Section: 3800

Washing Section : 92

Finishing Section: 409

Accessories : 70

Embroidery:120

Security: 30

Numbers of Machine in different section

❖ Knitting Section :

1. (circular knitting machine 87)

2. (Flat bed knitting machine 12)

❖ Dyeing Section: 26

❖ Printing section : 2 (All Over Printing)

❖ Washing Section : 9

Garments Production Capacity : 1 lacks pcs per day

Knitting Capacity : 30 tone per day

Dyeing / Finishing Capacity: 20 ton per day

Product Mix

Item of Product:

All types of knit product likes T-shirt ,Polo Shirt ,Fancy wear for men ,women's, boys, girls,

Main	North America
Markets	: South America
	Western Europe
	Eastern EuropeEastern Asia
	Southeast Asia
	Mid East
	Africa
	Oceania

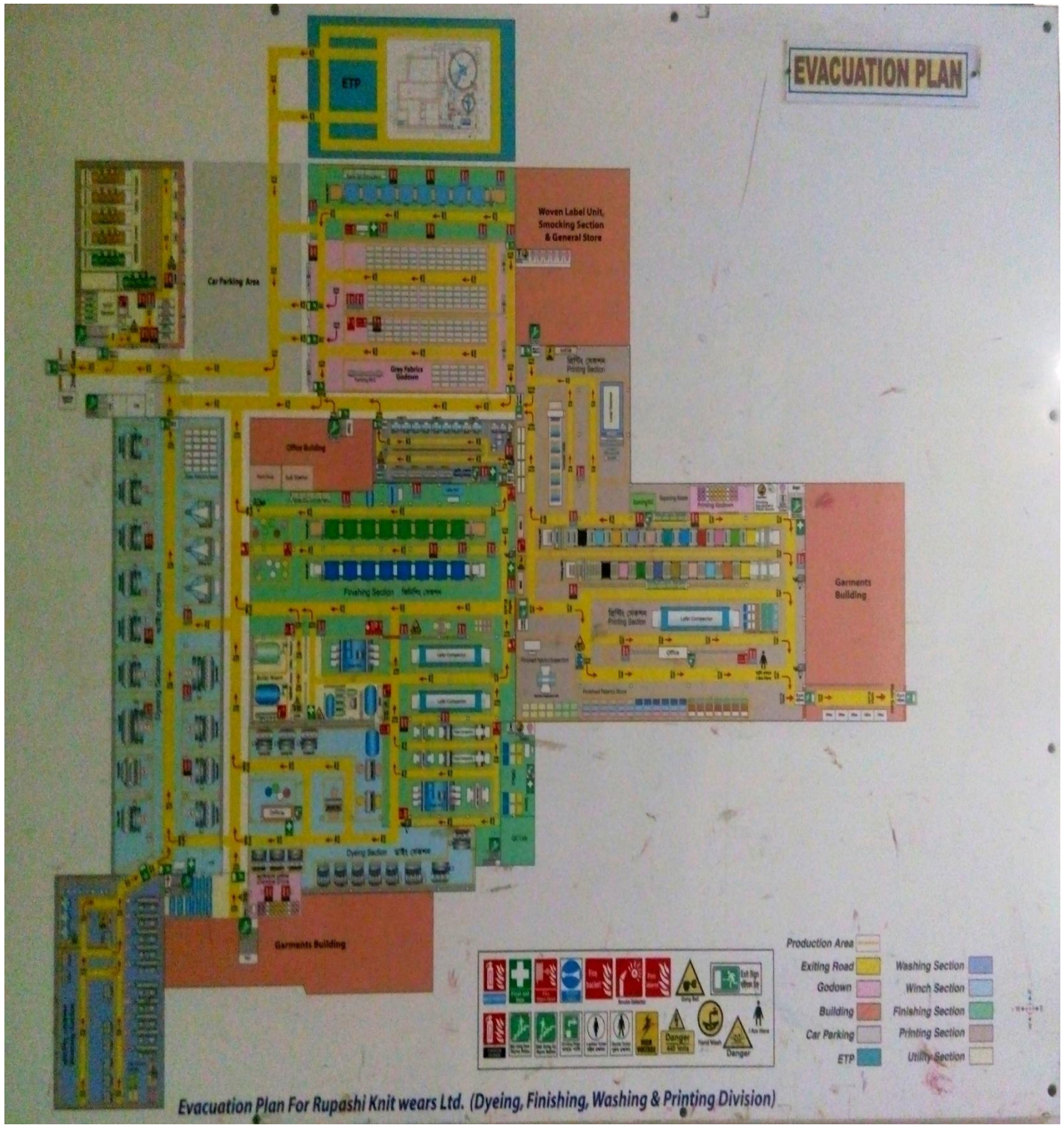
2.6.MAJOR BUYERS:

Buyer	Logo
MIAMI	
FOREVER21	
SOGO	
SILVIAN HEACH	

2.7.CERTIFICATION & AWARDS:

Certificated by	Organizations logo
WRAP	 <p>WORLD WIDE RESPONSIBLE WRAP APPAREL PRODUCTION GOLD CERTIFICATE OF COMPLIANCE</p>
OEKO TEX	 <p>CONFIDENCE IN TEXTILES Tested for harmful substances according to Oeko-Tex Standard 100 Test-No ZHCA 029639 TESTEX Zurich OEKO TEX</p>
AJA UKAS	 <p>ANGLO JAPANESE AMERICAN AJA REGISTRARS ISO 9001:2008 Reg No 059 CERTIFICATE NUMBER : AJA09/13636 UKAS QUALITY MANAGEMENT</p>

2.8.FACTORY LAYOUT



Man power distribution

Number of man power in Rupashi Knit Wears Ltd:

<u>Department</u>	<u>No. of People</u>
Knitting	300
Dyeing	277
Printing	120
Finishing	409
Washing	92
Garments	3800
Accessories	70
Embroidery	120
Security	30
Total	5218

2.9.VISION AND MISSION

Vision :

The mission and vision of. Rupashi Knit Wear Ltd (RupashiGroup). is to manufacture and deliver high quality readymade garments (RMG) to its customers. The core objective is to attain and enhance customer satisfaction by providing on time delivery of desired quality readymade garments and also to increase efficiency of workforce.

Mission:

To attain these objectives, the management of Rupashi Knit Wear Ltd (RupashiGroup). has decided to adopt the following-

- ❖ To increase awareness regarding customers requirements throughout the organization.
- ❖ By providing training to develop efficiency of the employee.
- ❖ To collect customer's feedback regularly to know about their conception about their company and to take timely appropriate action.

3.DETAILS OF ATTACHMENT

3.1.KNITTING SECTION

Introduction

The process in which the fabrics are produced by set of connected loops from a series of yarn in weft & warp direction in called knitting. There are two types of Knitting machine are available such like **circular knitting machine & flat knitting machine**. In flat knitting, which can be done two straight needle produce, a langth of cloth, while circular knitting, which is done on circular or double pointed needles, producesa seamless tube. Different yarns and knitting needles may be used to achieve different end products by giving the final piece a different color, texture, weight. Or integrity. Using needles of varying sharpness and thickness as well as different varieties of yarn adds to the effect.

❖ **Warp Knit :**

Warp knitting is the process of making a fabric in which the loops in a vertical or warp wise direction; The yarn is prepared as warp on beams with one or more yarns for each needle. The fabric has a flatter , closer, less elastic knit than weft knit and is very often run resistant.

❖ **Weft Knit :**

Weft knitting is the most common type of knitting, it is the process of making a fabric by forming a series of connected loops in a horizontal or filling-wise direction; production on both flat and circular knitting machines.

3.1.1.ORGANOGRAM OF KNITTING SECTION:

- ↓ Executive Director
- ↓ AGM
- ↓ Knitting Manager
- ↓ Manager in charge
- ↓ Quality in Charge
- ↓ Supervisor
- ↓ Operator
- ↓ Helper

3.1.2.RAW MATERIALS FOR KNITTING USED IN RUPASHI KNIT WEARS LTD :

Raw material is important elements for knitting production. It plays a vital role in continuous production and for high quality fabric.

Types of Raw Materials:

1. Card Yarn
2. Comb Yarn
3. Lycra
4. Slub yarn
5. Filament Yarn
6. Gray Milan

Sources of Yarn For Knitting:

Cotton:

- ❖ Jamuna Spinning Mill
- ❖ Pakiza Spinning Mill
- ❖ M.S.A Spinning Mill
- ❖ A.A Spinning Mill
- ❖ Tara Spinning mill

Polyester Yarn: India

Lycra : Indronesia, India

3.1.3.MACHINE DESCRIPTION OF KNITTING SECTION:

Number of Circular Knitting machine: 89

- ❖ S/J machine: 54
- ❖ Rib Machine: 33
- ❖ Auto Stripe Machine: 02

Number of Flat Knitting machine: 12



Fig: Circular Knitting Machine

Specification of S/J knitting machine

Brand name	HAANTEX
Model	HN-SJ-90
Country of Origin	China
Voltage	400v
Machine Dia	38”
Machine Gauge	24
Number of Needle	2864

Machine Weight	2800 kg
Year of Built	2008
Production Capacity	310 kg/day
Number of Feeder	114 (3 feeder)

Specification of Rib Machine:

Brand name	HAANTEX
Model	HN-DJR
Country of Origin	China
Voltage	400v
Machine Dia	36"
Machine Gauge	18
Number of Needle	2040
Machine Weight	2800 kg
Year of Built	2011
Production Capacity	150 kg/day
Number of Feeder	72 (2 Feeder)

Specification of Auto Stripe Knitting Machine:

Brand name	WELLKNIT
Model	WS/1 4FPA
Country of Origin	China
Voltage	400v
Machine Dia	30
Machine Gauge	24
Number of Needle	2268

Machine Weight	2800 kg
Year of Built	2010
Production Capacity	
Number of Feeder	42

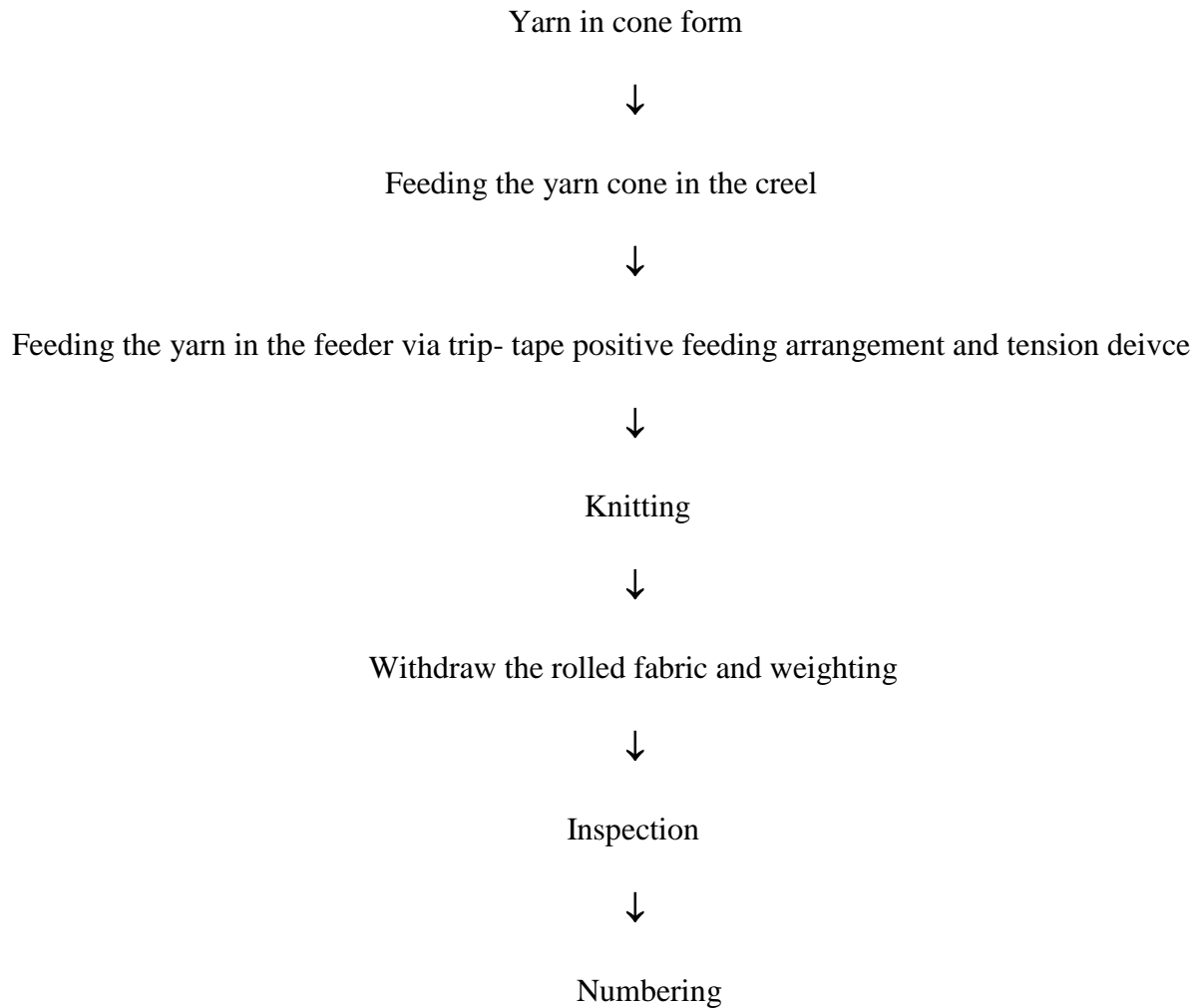
Flat bed knitting m/c specifications:

Brand Name	Kauo Heng
Model	JL-303
Number of Needle	1200
Machine Gauge	14
Country of Origin	Taiwan
Production Capacity	400 pcs collar
Power	220v



Fig: Flat Bed Knitting Machine

3.1.4.PROCESS FLOW CHART OF KNITTING:



Product mix of Rupashi Knitting

The RUPASHI knitting follows the product mix:

- ❖ 100% Cotton
- ❖ 100% Viscose
- ❖ Grey Mélange
- ❖ CVC (60% Cotton+ 40% polyester, 80% Cotton+20% polyester)
- ❖ Polyester

- ❖ Lycra
- ❖ 60/40 Cotton /Modal

End products of Circular Knitting Machine:

Single Jersey M/C:

1. S/J Plain
 2. Single Lactose
 3. Double Locoest
 4. Single pique
 5. Double pique
1. Terry
 2. Fleece

Interlock M/C:

- a) Interlock pique
- b) Mash fabric
- c) Face/Back rib

Rib M/C:

- a) 1*1 Rib fabric
- b) 2*2 Rib fabric

3.1.5.PRODUCTION CALCULATION:

$$= \frac{\text{Stitch length} * \text{No of needle} * \text{total feeder} * \text{R.P.M} * 24 * 60 * \text{Efficiency\%}}{10 * 2.54 * \text{m/c dia} * 840 * \text{yarn count} * 2.2004}$$

$$= \frac{2.60 * 2866 * 114 * 17 * 24 * 60 * .80}{10 * 2.54 * 38 * 840 * 30 * 2.204}$$

= 310kg/day

Considerable points to produce knitted fabrics:

When a buyer orders for fabric then they mention some points related to production and quality. Before production of knitted fabric, these factors are needed to consider. Those are as follows-

- ❖ Type of Fabric or design of Fabric.
- ❖ Order quantity
- ❖ Finished G.S.M.
- ❖ Yarn count
- ❖ Types of yarn (combed or carded)
- ❖ Diameter of the fabric.
- ❖ Stitch length
- ❖ Number of machine to be used
- ❖ Source of yarn

During knitting some points need to be controlled very carefully such as stitch length, Fabric GSM, Fabric dia.

Fabric GSM control process:

- ❖ Fabric GSM can be changed by VDQ pulley
- ❖ Minor control can be done by stitch length adjustment
- ❖ Altering the position the tension pulley changes the GSM of the fabric. If pulley moves towards the positive direction then the GSM is decreased and the reverse direction GSM will increase.

Some technique that may increase production of knit fabric:

- ❖ Fabric production will be high by increasing machine R.P.M . But make sure that the tension should not be excess.
- ❖ Fabric production will be high by increasing the number of feeder.
- ❖ The more the machine gauge, the more the production.
- ❖ For smooth operation automatic machine lubrication system can be applied.

Relation Between Card yarn count & fabric GSM during S/J knit fabric production without Lycra:

Required GSM	Yarn Count	Fabric Type
---------------------	-------------------	--------------------

110-115	40s (Card Yarn)	S/J
130-150	30s (Card Yarn)	S/J
150-160	28s (Card Yarn)	S/J
160-170	26s (Card Yarn)	S/J
170-180	24s (Card Yarn)	S/J
180-190	22s (Card Yarn)	S/J
190-200	20s (Card Yarn)	S/J

Relation Between yarn count & fabric GSM during S/J knit fabric production with Lycra:

Required GSM	Lycra	Lycra %	Yarn count	Fabric Type
150-160	20 Denier	5%	40s	S/J
170-180	20 Denier	5%	34s	S/J
190-200	20 Denier	5%	30s	S/J
210-220	20 Denier	5%	26s	S/J
220-240	40 Denier	8%	26s	S/J

Relation Between yarn count & fabric GSM during (1x1) Rib fabric production:

Required GSM	Yarn Count	Fabric Type
130-150	40s	(1x1) Rib
150-180	34s	(1x1) Rib
180-200	30s	(1x1) Rib
200-230	26s	(1x1) Rib
230-240	24s	(1x1) Rib

Relation Between yarn count & fabric GSM during Interlock fabric production without lycra :

Required G.S.M	Yarn count	Fabric type
200-220	34s	Interlock
220-230	32s	Interlock
230-250	30s	Interlock
250-300	26s	Interlock

3.1.6.REQUIRED CAM ACCORDING TO FABRIC TYPES:

No.	Fabric type	Required cam
01	Lycra S/J	Knit cam
02	Double PK	Knit cam, Tuck cam
03	Lacoste(S/J)	Knit cam, Tuck cam
04	Lacoste (D/J)	Knit cam, Tuck cam
05	Rib	Knit cam
06	Fleece	Knit cam, Tuck cam, Miss cam
07	Single Jersey	Knit cam
08	Terry	Knit cam, Tuck cam, Miss cam
09	Interlock	Knit cam, Miss cam

Design Development by using CAM:

The type of fabric to produce depends on the setting of the Cam of Knitting machine. The different types of fabric can be produced by only changing the cam setting. The cam settings to produce different fabric are given below:

Single jersey:

Only knit cams are used to produce single jersey fabric. So the setting would be-

K K K

K K K

K K K

Inter lock:

Inter lock fabric is produced by using knit and miss cam. So the setting would be-

K M K

M K M

Lacost:

Lacost uses knit and tuck cam like-

K K T K K

T K K K T

French terry:

The cam setting is as follows-

K M K M K M

K T K M K T

K M K T K M

Polo PK Cam arrangement

K K T T

T T K K

Double Lacoste Cam arrangement

K K K T T K

T T K K K K

K K T T

K K K T T K

Fleece cam arrangement

K K T K K M

K K M K K M

K K M K K T

Knit fabric sample:

Single jersey fabric	Rib fabric	Interlock fabric

Pique fabric	Fleece fabric	Terry fabric

3.1.7.QUALITY CONTROL OF GREY FABRIC:

Rupashi knit wears ltd. Follow 4 point system in grey quality measurement. Following table shows 4 point grading system and acceptance calculation

In 4 point system

- ❖ At first the defects are identified in the roll and marked by red arrows.
- ❖ Individually the length of defect is measured and record
- ❖ Then penalty point is measured

4 point grading system

Size of defect	Penalty point
3 inch or less	1 point
Over 3 to below 6 inch	2 point
Over 6 to below 9 inch	3 point
Over 9 inch	4 point
Below 1 inch hole	2 pint
Over 1 inch hole	4 point

3.1.8.COMMON FAULTS FOUND IN GREY QUALITY SECTION:

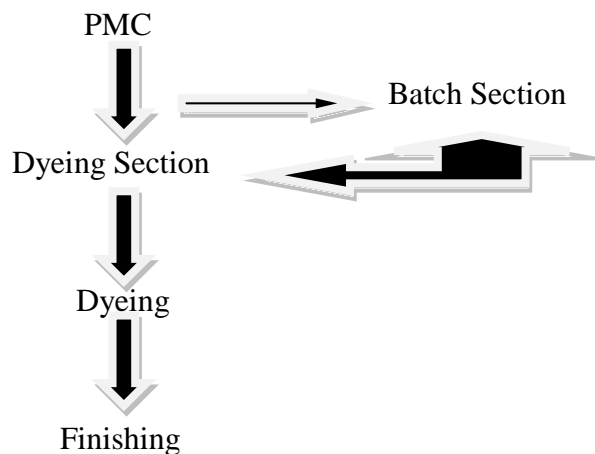
- ❖ Hole
- ❖ Pin hole
- ❖ Patta
- ❖ Oil stain
- ❖ Rust stain
- ❖ Grease stain
- ❖ Yarn missing
- ❖ Drop stitch
- ❖ Dirt stain
- ❖ Needle line
- ❖ Uneven tension
- ❖ Star
- ❖ Thick/Thin
- ❖ Slub
- ❖ Sinker mark
- ❖ Fly contamination
- ❖ Mixed yarn
- ❖ Yarn contamination
- ❖ Wrong design

3.2.DYEING SECTION

3.2.1.ORGANOGRAM OF DYEING SECTION:

- ↓ Executive Director
- ↓ General manager
- ↓ SR. Manager
- ↓ Production manager
- ↓ Production officer
- ↓ Dyeing master
- ↓ Shift in charge
- ↓ Floor in charge
- ↓ Supervisor
- ↓ Operator
- ↓ Helper

Material flow :



Capacity of dyeing section

The state of art machine is used to ensure matching and quality of dyeing products .Perfection is sought in dyeing process to satisfy our customers and buyers while fulfilling their specification and requirements.

Total production capacity is 20 ton per day

Machines are used in dyeing section :

Floor no :01

Total dyeing machines are 13.

Floor no :02

Total dyeing machines are 13 and some machine specification with capacity given below :

Dyeing machine specification: 01

Brand name	FONG'S
Country of origin	China
Model no	HSJ-6T
Capacity	1200KG
Voltage	415/50Hz
Machine type	High Temp. machine

Dyeing machine specification: 07

Brand name	FONG'S
Country of origin	Turkey
Model no	DMS11,HT-JUMBO
Capacity	600KG
Voltage	400/50Hz
Machine type	Moderate Temp. machine

Dyeing machine specification: 10

Brand name	FONG'S
Country of origin	Tiwan
Model no	3MU672-6
Capacity	1200KG
Voltage	415/50Hz
Machine type	High Temp. machine



Fig: Dyeing Machine

3.2.2.RAW MATERIALS FOR DYEING

Raw materials used in the dyeing section are :

1. Grey fabrics
2. Dyes
3. Chemicals

1.Grey fabrics

Following types of grey fabrics are dyed:

- a) Single jersey
- b) Single jersey with lycra
- c) Polo pique
- d) Back pique
- e) Single lacoste
- f) Double lacoste
- g) Fleece
- h) Interlock
- i) Terry

- j) Mini tery
- k) Interlock with lycra
- l) Rib
- m) Rib with lycra
- n) 1*1 rib
- o) 2*2 rib
- p) Different types of collar and cuff.

3.2.3.CHEMICALS AND DYES USED IN THE DYEING SECTION

Chemicals name	Agent
Non wash	Machine wash
Fortex-TPA	Fixing agent
Kappazon H-35	Stablizier
Kappavon-C	Anti –creasing
Kappaquest-FE	Sequestering
Kappaso-AF-2000	Anti foaming
Kappawet-BOSS	Detergent
Forfix-ESR	Oil remover
Kappaquest-A-41	Sequestering + leveling
Ac-65	Leveling
Kappaquest-K-83	Leveling
Jinlev-RLF349	Leveling polyester
Jinsofter –NP-825	Poly clean softener
Acramine prefix-K	Catarizer
Acrafix-EF	Pigement fixer
Kappalink –SCL	Rasing
Kappavon LD-360	Polyester leveling

Chimperse RSK	Soaping
Kappafix –GG-100	Fixing
Kappafix –BS	Fixing
Kappafix –MS	Silicone softener
Kappazyme –AP	Peroxide killer
Hydrogen peroxide 35%	
Skaywhite –BVB	Optical brightner
Leuchophor-BMB	Optical brightner
Russacid –N-liquid	Hazardous item
Sodium sulphid	Hazardous item
Soda ash light	Hazardous item
Caustic soda	Hazardous item
Jintex MIS	Fixing
Jintex QSE	Sequestering
Jintex SQ114	Sequestering Agent for terquies color

3.2.4.FUNCTIONS OF VARIOUS CHEMICALS AND AUXILIARIES USED IN DYEING

There are various kinds of chemicals and auxiliaries are used in textile dyeing. Their functions are mentioned in the below:

1. Wetting agent(Detergent):

- ❖ To wet the fabric as well as dye stuff.
- ❖ To reduce the surface tension of water as if it allows the dye stuff for easy penetration into fiber.
- ❖ Help to increase dye uptake to fiber by wetting it.Emulsify oil, fats, waxes and remove oil-borne stains.

2. Antifoaming agent:

- ❖ Generally the dye molecule contains some of oil, wax & others impurities thats are responsible to make foam which needs to prevent from fabric. So this agent helps to prevent the foam formation

3. Anti-creasing agent:

- ❖ It helps to remove the crease marks of fabric

4. Sequestering agent:

- ❖ It helps to remove the hardness of water.

5. Stabilizer:

- ❖ It preserve the strength loss of the H_2O_2 .That is, it helps to catch the powerity of H_2O_2

6. Caustic Soda:

- ❖ When the temperature is increased then it has to possibility to reduce the powerity of H_2O_2 (At $90^\circ C-110^\circ C$).So stabilizers are used.

7.Soda Ash:

- ❖ Used in scouring which removes the oil, wax and others impurities from the fabrics.
- ❖ It increases the absorbency of the fabrics.(During pretreatment)
- ❖ After dyeing of a fabric, the Soda Ash helps to stain (catch) the fabric's color. So it acts as fixing agent.(During dyeing) & It increases the activity of salt.

8.Bleaching agent:

- ❖ It removes the natural color from the fabric.
- ❖ It increases the whiteness of the fabric.

9.Acetic acid:

- ❖ It is used to neutralize the solution for controlling the p^H . The alkalinity may reduce by using it in solution.

10. Enzyme:

- ❖ It removes the hairiness/ floated fiber from the surface of fabric.

11. Peroxide killer:

- ❖ To remove the residual peroxide from the fabric.

12. Leveling agent:

- ❖ It spreads the color evenly through the whole of the place of the fabric.

13. Dye stuff:

- ❖ To make color the fabrics by using dye stuff.

14. Oil remover

- ❖ Remove the oily material from the surface of fabric.

15. NaCl/ Glauber salt (Electrolyte):

- ❖ The attraction powerity of a salt to water is higher. So when NaCl is added to water then it falls on the dyes. It spreads color evenly to whole place of the fabric.
- ❖ To increase the absorption powerity of the dye to fiber.

16. Carrier:

- ❖ Carrier transports the dye to the fiber.
- ❖ Used for fixing disperse dyes on polyester or polyester wool blends at temperature below 105°C.
- ❖ They make dye film on the surface of the fiber.
- ❖ To increase the dyes take up% by covalent bond of the fiber liquid. They may act as molecular lubricant.

17. Dispersing agent:

- ❖ To spread dye molecules into the fiber.
- ❖ It assists the process of particle size reduction of the dye.
- ❖ To assist dye penetration.
- ❖ To increase solubility of the dyes.

18. Hydrose:

- ❖ To remove the unfix color from the ground of fabric.(During Reduction Clearing)
- ❖ Machine wash(When Light color will dye after Deep shade then the machine wash is carried out)
- ❖ Stripping purpose (For removing the fix color from fabric. Here NaOH also mixes for stripping)

19. OBA:

- ❖ Used as physical brightening (bleaching) agent in fabric.
- ❖ It increases the whitening effects on the fabric surface.

- ❖ It is generally used after scouring and bleaching.

20.Soaping:

- ❖ The floated colors are removed from fabric by soaping.
- ❖ The stability of color's brightness is increased as a result of soaping.

21.Softener:

- ❖ After dyeing, the fabric is remained hard in nature. So softener is used to make the fabric soft in nature.

22.Fixing agent:

- ❖ It helps to fix the color in the fabric.
- ❖ Enhance wet fastness for heavy shade but usually reduce light fastness.

3.2.5.OPERATION SEQUENCE & RECIPE OF DYEING:

Operation step for scouring and bleaching in batch

Fill water in the machine



Fabric load



Chemicals



Raise temp.



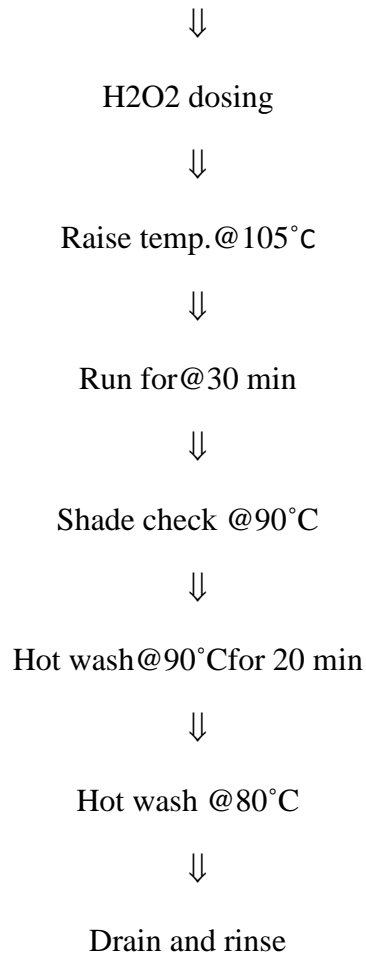
Run 10 min



Caustic soda dosing @60°C



Raise temp. @70°C



Scouring and bleaching recipe

- ❖ Wetting agent (felosan NOF)-.5g/l
- ❖ Sequestering agent (secron 540)-1 g/l
- ❖ Anti foaming agent (primasol jet)-1 g/l
- ❖ Caustic soda agent -.5g/l
- ❖ Hydrogen per oxide -4g/l
- ❖ Stabilizer (stagen B)-1g/l
- ❖ Acetic acid 1g/l
- ❖ Per oxide killer (PK-20)-.5 g/l
- ❖ M:L – 1:10
- ❖ Temperature -105°C
- ❖ Principle operation time -30 min (total time 1.30hrs)

Dyeing Operation process of reactive dyes (black shade)

Fabric GSM:200-205

Total fabric weight :100kg

Fabric types : Lycra/single jersey

1st step : loading hot at 70° c ,20 min

Chemicals used:

Chemicals	Dosing ratio	Total quantity of chemicals
Boss(detergent)	0.2g/l	1.6kg
Anti-creasing (Kappavon-C)	.4 g/l	1.6kg
FE(Sequestering agent)	.2g/l	1.6kg

2nd step :Scouring at 98° C and bleaching at 70° C, 60 min respectively

Chemicals	Dosing ratio	Quantity
AF-2000(Anti-foaming agent)	.2g/l	1.6kg
Boss 0.75	.75g/l	6kg
FE(sequestering agent)	.5g/l	4kg
Anti –creasing	1.5g/l	12kg
ESR Oil remover	.g/l	4kg
Caustic	1.5g/l	12kg
H-35(Anti-per oxide)	.7g/l	5.6kg
H2O2	2.5g/l	20kg

3rd step : Normal Hot at 90° C and 10 min

a)Neutralized at 60° C ,20 min : chemicals used acetic acid – dosing 0.7g/l,quantity-5.6 kg

b) per oxide killer (A.p): chemical used A.p- dosing 0.4 g/l,quantity-3.2kg

4th step : cold wash 10 min

5th step : neutralized at 60° C

Chemicals used as acetic acid – dosing .4g/l,quantity -3.2kg

(PH control :ph-4.5)

6th step : Per oxide killer at 55°C,15 min

Added enzyme (bio-polishing agent)- dosing 1g/l,quantity-10 kg

(if buyer required) at 55C, 1 Hour

7th step: Leveling agent at 60°C

Chemicals	Dosing ratio	Quantity
AF-2000(anti foaming)	.2g/l	1.6kg
Anti-creasing	1.5g/l	12kg
FE-sequestering agent	1g/l	8kg
A-41(leveling agent)	1.5g/l	12kg

8th step : added dyes

Color	Dosing%	Total Quantity KG
R/B-deep yellow	.88%	8.8
R/B-Red(H.B)	.1	10
KIRA-black-b	1.69	16.2
KIRA-BLACK-HBD	4.25	42.5

(salt sample shade check and then caustic ,soda ash added)

9th step : again cold wash at 10 min

10th step : Hot wash at 60°C ,10min

11th step: added acetic acid at 50° C,15 min

12th step: cold wash 10 min

13th step : hot wash 90°C,10 min

(by RSK)

14th step : added softener at 40°C, 20 min

(Before adding softener we should make the water hot)

15th step : Drain and Rinse

Some dyeing parameters they maintain in their dyeing section

Process	Ph	Temperature (°C)	Time	M:L Ration
Scouring and bleaching	11	98/105	45/30	1:10
Dyeing	9-11	60/80/98	60	1:8
Hot wash	Neural	90/95	10	1:10
Enzyme	4-5	55	60	1:55
Stripping	11-12	98	40	1:8/1:10
Softening	5.5-6	40	20	1:8
Fixing	5.5-6	40	20	1:8

Goals of dyeing:

- ❖ Shade with the tolerance limit
- ❖ Perfect leveling, Bleaching, Scouring, Soaping etc.
- ❖ No crease mark, Foaming etc.
- ❖ Fastness properties according to requirement.

3.3.PRINTING SECTION

3.3.1.ORGANOGRAM OF PRINTING SECTION:

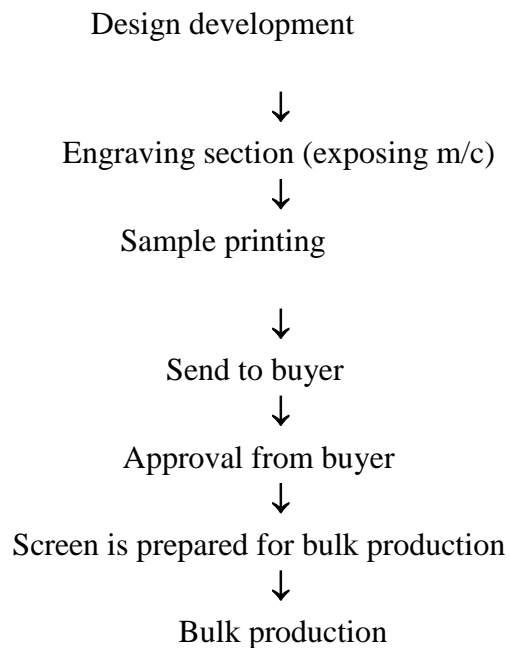
- ↓ Executive Director
- ↓ General Manager
- ↓ SR. Manager
- ↓ Production manager
- ↓ Production officer
- ↓ In charge
- ↓ Supervisor

Printing is applying color only to defined areas of a substrate to obtain the desired pattern.

There are basically two types of printing:

- (i) Discharge printing
- (ii) Direct printing

3.3.2.PROCESS FLOW CHART OF PRINTING :



3.3.3.DIFFERENT TYPES OF PRINTING PROCESS USED IN THE FACTORY :

- ❖ All over printing
- ❖ Screen printing
- ❖ Block printing
- ❖ Burn out
- ❖ Chest printing
- ❖ Rubber printing
- ❖ Discharge printing
- ❖ Stone printing
- ❖ Sticker printing(supplementary printing)



Fig: All Over Printing Machine

Pigment dyes and reactive dyes are used in printing section of rupashi group:

- a) NK-FIXER
- b) KAPPAMID-ZT-63
- c) DCTAMINE GREEN
- d) FINISH-S

- e) DECTAMINE YELLOW FT-GGP
- f) DECTAMINE VOILT FT-FB
- g) DCTAMINE T-BLUE
- h) DCTAMINE BLUE-FT-FFG
- i) PIGMA BLACK
- j) DCTAMINE –RED-GRC
- k) DCTAMINE ORANG
- l) DCTAMINE RED
- m) PIGMENT ROSE-LR
- n) COSMOSS-PINK-L2R
- o) PIGMENT YELLOW-10G
- p) FLUROCENT RED-CPI-12
- q) FLUROCENT ORANG
- r) COTIOX-KA -100(TITANIUM DIOXIDE)
- s) PRINTEX-Y(BURN OUT GUM)
- t) SODIUM ALGINATE AAA-R
- u) ALGENT GUM
- v) RESIST SALT
- w) UREA (pigment chemicals)

3.3.4.CHEMICAL AND DYES USED IN PIGMENTS PRINTING:

Pigment + binder + thickener + softener + surfactant + urea (hygroscopic agent) + anti choking agent (if required).

Chemical and dyes used in reactive printing:

Sodium Alginate + NaHCO_3 (fixing agent) + Hexa Metaphosphate (water softener) + Soda Ash (Oxidation) + urea (hygroscopic agent) .

Total no. of printing machine name with specification :

Machine name : All over printing machine(02)

Specification :

Company name	Kuil machinery industries ltd.
Country of origin	Korea
Model no	GP-6400

Chest printing floor capacity :

❖ Number of table: 06

- ❖ Per table capacity : 125 pcs
- ❖ Production capacity : 2000 pcs/ day

Common defects in printing section :

- ❖ Improper positioning of print
- ❖ Fluff
- ❖ Sharpness blur
- ❖ Joint marks

3.4.FINISHING SECTION

Finishing:

The making of a marketable and consumer usable textile is not completed after fabric production dyeing or printing operation. Fabrics usually still need to undergo an additional processing known as finishing, which is the final processing before the fabric is cut into apparel or made into any articles of textiles. Finishing is what improves attractiveness and makes fabrics suitable for their intended end use.

3.4.1.ORGANOGRAM OF FINISHING SECTION:

- ↓ Executive Director
- ↓ General manger
- ↓ SR. Manager
- ↓ In change
- ↓ Supervisor
- ↓ Operator
- ↓ Helper

3.4.2.TOTAL MACHINE IN FINISHING SECTION

Machine name	Number of machine
Stenter machine	04
Open compacting	03
Tube compacting machine	02
Tube drayer	02
Tube silicon machine	02
Soft calendar machine	03
Fabric inspection machine	06

Finishing section is consisting of two lines. They are –

1. Open Fabric finishing
2. Tube Fabric finishing

1. The machine that are used for open fabric mentioned in the bellow →

- ❖ Slitting and Dewatering machine
- ❖ Stenter machine
- ❖ Open width compactor.

2. The machines that are used for tube line mentioned in the bellow →

- ❖ Dewatering /Squeezer machine
- ❖ Dryer machine
- ❖ oft setting calender
- ❖ Compactor machine

3.4.2.OPEN FABRIC FINISHING :

Slitter and De-watering M/C-(01,02,03):

Specification:

Brand name	: TAOYOUN
Manufacturing Country	: Taiwan
Year of manufacturing	: 2007
Max speed	: 100rpm
M/c width	: 48 inch
Max capacity	: 8 tons

Operational parameter:-

- ❖ Set the padder pressure as required (3-7bar)
- ❖ Set the speed as much as possible (30-80m/**min**).

Function of the Machine:

- ❖ Used to remove excess water after pretreatment and dyeing
- ❖ To slit the tube fabric by the knife for opening of the fabric and ready for stentering

- ❖ Delivered fabric in crease free state
- ❖ Before squeezing balloon is formed with the help of compressed air passing by a nozzle or air sprayer
- ❖ It can control the diameter of fabric and GSM and shrinkage by over feeding mechanism
- ❖ To open the fabric from tubular form to open width form
- ❖ Fabric is cut according to the needle drop.

Stenter m/c – 01 :

Specification:

Brand name	: ORTHOMAT
Manufacturing country	: Taiwan
Year of manufacturing	: 2007
Number of chamber	: 08
Maximum speed	:80m/min
Minimum speed	:04m/min
Production/day	: 08tons/day
Maximum Temperature	: 200°C
Max Dia	: 98 inc



Fig: Stenter Machine

Function of Stanter machine:

- Drying
- Shrinkage control
- Heat setting in case of p/c & 100% polyester, Lycra, grey mélange fabric etc.
- Width control
- Finishing chemical application.
- Loop control
- Moisture control, etc.

Heating system: Gas Burner

Gripping system of fabric edges: Pinning

Utilities used:

- Gas
- Steam

Controlling points:

- Fabric speed
- Fabric width
- Temperature
- Overfeed %
- pH of fabric(pH=5-6)

Used chemicals in stenter:

Acid(As required)

Silicon base softener (4gm/L)

Open width compactor m/c: (machine -01)**Specification:**

Brand name	Lafer
Manufacturing country	Italy
Year of manufacturing	2004
Maximum speed	50m/min
Minimum speed	08m/min
Production/day	12 tons/day
Maximum Temperature	150°C
Overfeed%	0.5% – 40.0%
Maximum dia	92-105

Function:

- ❖ Shrinkage control
- ❖ GSM control
- ❖ Width control
- ❖ Fabric's dia
- ❖ Ironing of fabric

Utilities used:

- ❖ Gas
- ❖ Steam

Controlling points:

- ❖ Fabric speed
- ❖ Fabric width
- ❖ Temperature
- ❖ Overfeed %

3.4.3.TUBE FABRIC FINISHING

Squeezer /De-watering machine: (01,02,03)

Specification:	
Brand name	AKAB CALATOR
Manufacturing country	SWEDEEN
Year of manufacturing	2007
Maximum speed	59rpm
Minimum speed	44rpm
Normal working speed	35-40m/min
Production/day	6 tons/day
Maximum Temperature	150° C
Overfeed%	0.5% – 40.0%
Maximum dia	48inc

Dryer machine: 01 (Steam)

Specification:	
Brand name	TONG
Manufacturing country	Taiwan
Year of manufacturing	2006
Maximum speed	16rpm
Minimum speed	06rpm
Production/day	08 tons/day
Maximum Temperature	130 ⁰ C
Overfeed%	0% to -25%
Maximum dia	92-105
No of Chamber	06

Following things are also considered incase of Dryer machine:

- ❖ If fabric is redder than the standard one, then reduce the temperature.
- ❖ If fabric is more Yellower than the standard one, then increase the temperature.
- ❖ If fabric is more Bluer than the standard one, then increase the temperature.

All this data's are practiced in mills which may vary factory to factory.

Tube compactor Machine:

Tube compactor Machine: 01 &02 Specificaion:

Brand name	TUBTEX
Manufacturing country	U.S.A
Year of manufacturing	2004
Maximum speed	: 70 rpm
Minimum speed	10rpm
Production/day	6 tons/day
Maximum Temperature	108°C

Function:

- ▶ Shrinkage control
- ▶ GSM control
- ▶ Width control
- ▶ Ironing the fabric

Special feature of Compactor:

- ❖ Operating system is computerized.
- ❖ Steam bar present which soften the fabric for compacting.
- ❖ In compacting zone, edge & retard roller, compacting shoe and steel plates are present.
- ❖ A pair of pulley present for fabric dia control.
- ❖ Fabric G.S.M, shrinkage and dia control.



Fig: Tube Compacting Machine

Raising machine

Brand	Capacity/Day (kg)	Origin	Type	Unit
Zematex	6tone/day	Germany		1

- ❖ This m/c is used only for raising finishing which imparts a hairy surface to the fabric.
- ❖ A layer of fabric fibers lifting from the body of the fabric is achieved by passing it over a no. of pile R/r and counter R/r.
- ❖ It is mostly applied on Terry fabric, Polar fabric etc.

Specification of Pitch machine:

Brand name:	Lafer
Country of origin	Italy
Model	10GSY2272
Voltage	400V

Specification of Brush machine/peach finish machine :

Brand name	Lafer
Country of origin	Taiwan
Model	RG2-2200
Power	380V
Capacity	6tone/day

3.4.4.FAULTS, CAUSES AND THEIR REMEDIES ON QUALITY CONTROL & ASSURANCE DEPARTMENT

Oil Stain

Causes

- ❖ When oil lick through the needle trick then it pass on the fabrics and make a line.

Rust Stain

Causes

- ❖ If any rust on the machine parts.

Uneven dyeing

Causes

- ❖ Uneven pretreatment (uneven scouring & bleaching).
- ❖ Improper color dosing.
- ❖ Using dyes of high fixation property.
- ❖ Uneven heat-setting in case of synthetic fibers.
- ❖ Lack of control on dyeing m/c.

Batch to Batch Shade Variation

Causes

- ❖ Fluctuation of Temperature.
- ❖ Improper dosing time of dyes & chemicals.
- ❖ Dyes lot variation.
- ❖ Improper reel speed, pump speed, liquor ration.

- ❖ Improper pretreatment.

Crease Mark

Causes

- ❖ Poor opening of the fabric rope.
- ❖ Shock cooling of synthetic material.
- ❖ If pump pressure & reel speed is not equal.
- ❖ Due to high speed m/c running.

Dye Spots

Causes

- ❖ Improper dissolving of dye particle in bath.
- ❖ Improper dissolving of caustic soda particle in bath.

Softener Mark

Causes

- ❖ Improper mixing of the softener.
- ❖ Improper running time of the fabric during application of softener.
- ❖ Entanglement of the fabric during application of softener.

3.4.5. TESTING LAB

Various types of lab test are done in rupashi testing lab such as :

- ❖ Fabric shrinkage test
- ❖ Color fastness test
- ❖ Wash fastness test
- ❖ Pilling test
- ❖ Rubbing fastness test
- ❖ Light fastness test
- ❖ Shade variation test
- ❖ Perspiration test
- ❖ Bursting strength test
- ❖ Yarn count test
- ❖ Twist test
- ❖ Formaldehyde test
- ❖ Shade checking

Shade checking: Shade is density of fabric color which is a special word in dyeing, printing and finishing unit of a textile mill. It's the physical testing methods of offline quality control (QC) assurance system. Shade checking depends on the accuracy of the man's eye. It is a visual process for this reason some shade may exist different comments from different user. So, dyeing expert is essential for this purpose. Besides the computer color matching system can help man to take a decision about matching the shade of instance.



Fig Light Box For shade checking

Laboratory Machineris with its specification:

- 01). Machine Type : Pilling Tester.
Brand : Presto Stantest Private Ltd
Manufacturer : INDIA
Function :To determine the pilling resistance of fabric

- 02).Machine Type :Color Fastness to Rubbing
Brand : Presto Stantest Private Ltd
Manufacturer : INDIA

- Function : To determine the color fastness to rubbing of dyed fabric.
- 03.) Machine Type : Light Box
 Brand : Gotech Testing Machine
 Manufacturer :Taiwan
 Function : To match the shade color under different illuminant
- 04). Test Name : Color fastness to Wash.
 Brand : Presto Stantest Private Ltd
 Origin : INDIA
 Test Method : ISO 105-C06, ISO105-D0
- 05.) Test Name : Color Fastness to Perspiration
 Brand : Presto Stantest Private Ltd
 Origin : INDIA
 Test Method : ISO 105-C06
- 06.) Machine type :Twisting tester:
 Brand name : Fangyan Instrument Co. Ltd
 Origin : CHINA
 Function : To determine the net no of twist per inch/ cm /m of yarn.
- 07).Machine Name : Electronic wrap reel
 Brand Name : Fangyuan Instrument Co.Ltd
 Origin : CHINA
 Function : To Warp the yarn in predetermining length which helps to determine yarn count.
- 08) .Machine Name : Electronic yarn count tester
 Brand Name : Fangyuan Instrument Co.Ltd
 Origin : CHINA
 Function :To determine yarn count in TEX and English count
- 09) .Machine Name : Formaldehyde content test
 Brand Name : Fangyuan Instrument Co.Ltd
 Origin : CHINA
 Function : To determine the amount of formaldehyde present in dyed goods.
- 10). Machine Name : Digital Breusting Strength Tester
 Brand Name : Fangyuan Instrument Co.Ltd
 Origin : CHINA
 Function : To determine the bruesting strength of fabric

11). Machine Name : Light Fastness Machine
Brand Name : Q labcorporation
Origin :U.S.A
Function : To determine the light fastness of dyed Fabric

12) . Machine Name : Perspirometer
Brand Name : Fangyuan Instrument Co.Ltd
Origin : CHINA
Function : For the purpose of perspiration and other fastness properties tested .



Fig: Pilling Tester Machine



Fig: Light Fastness Tester Machine

3.5.GARMENTS SECTION

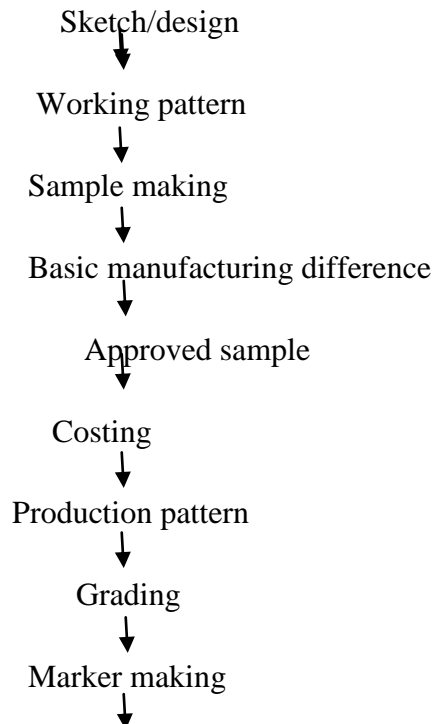
Some information about Garments section:

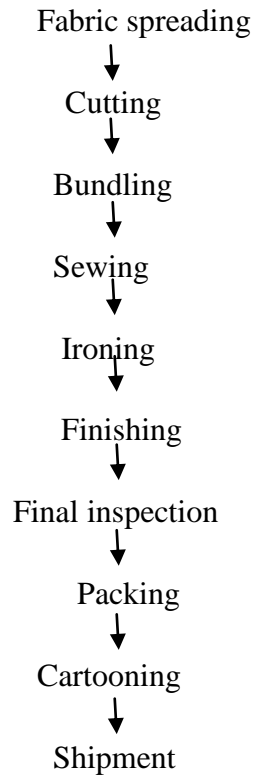
3.5.1.ORGANGRAM OF GARMENTS SECTION:

- ↓ Executive director
- ↓ General Manager
- ↓ Asst. General Manager
- ↓ Merchandising Manager
- ↓ Manager
- ↓ Production manager
- ↓ Supervisor
- ↓ Floor in charge
- ↓ Operator
- ↓ Helper

Main products produced in Rupashi Garments Division : Basic t-shirts, pique polo, tank top, boys t-shirts, and ladies wear, 1×1 rib, 2×2 rib, under garments for ladies & gents.

3.5.2.OPERATION SEQUENCES FOR GARMENTS SECTION:





3.5.3.MERCHANDISING DEPARTMENT:

Merchandising is a process through which products are planned, developed, executed and presented to the buyer. It includes directing and overseeing the development of the product line from start to finish.

Activities of merchandising department:

- ❖ **Product development**
- ❖ **Market and product analysis**
- ❖ **Selling the concept**
- ❖ **Booking orders**
- ❖ **Confirming deliveries**
- ❖ **Designing and sampling**
- ❖ **Costing(CM, C&F, CIF, FOB)**
- ❖ **Raw materials booking**
- ❖ **Flow monitoring**
- ❖ **Production follow ups**
- ❖ **Payments follows**
- ❖ **Accessories and trims booking**

RESPONSIBILITIES OF MERCHANDISER:

Responsibilities of Merchandising Team	
DEVELOPMENT AND COSTING	
01	<ul style="list-style-type: none"> <input type="checkbox"/> Reviewing the development packs RCVD from buyer. <input type="checkbox"/> Put the developments into work with product development team. <input type="checkbox"/> Clarify all necessary info with buyer as much as possible. <input type="checkbox"/> Follow up on the delivered sample deadline. <input type="checkbox"/> Work out the initial costing (all costing must be checked by merchandising manager) <input type="checkbox"/> Price negotiation with buyer. <input type="checkbox"/> Follow up with buyer reg. the feed back of the sample and costing
ORDER CONFIRMATION	
02	<ul style="list-style-type: none"> <input type="checkbox"/> Quoting the delivery dates to buyer after checking factory's capacity situation. <input type="checkbox"/> Checking all the details in the order sheet once received form buyer. <input type="checkbox"/> Communicate with buyer reg. any discrepancy in the order sheet. <input type="checkbox"/> Passing the correct order sheet to all concerned dept i.e. planning, production, commercial etc.

SAMPLING	
03	<ul style="list-style-type: none"> <input type="checkbox"/> Updating production development tem reg. different sample requirement of buyer at various stage (sales man, fit , sz set, pp sample etc) <input type="checkbox"/> Coordinating all fabric + trims which are required for sampling purpose. <input type="checkbox"/> Coordinating print, embroidery, wash for sampling. <input type="checkbox"/> Checking all the technical aspects of samples before releasing to customer. <input type="checkbox"/> Checking all the aesthetic aspects of samples before releasing to customer <input type="checkbox"/> Checking the quantity requirement of each sample. <input type="checkbox"/> Checking the necessary paper work of reach sample. <input type="checkbox"/> Follow up the buyer reg. each sample comments.
BULK FARBIC	
04	<ul style="list-style-type: none"> <input type="checkbox"/> Work out the consumption for each new styles from CAD. <input type="checkbox"/> Provide fabric booking to fabric department with correct quantity and all necessary information. <input type="checkbox"/> Follow up on the labdips/ strike off submission and chase approval comments. <input type="checkbox"/> Follow up on the fabric delivery against critical path <input type="checkbox"/> Follow up on all fabric approval related issues. <input type="checkbox"/> Prioritizing the fabric delivery schedule based on the garment delivery dates.
BULK TRIM	

05	<ul style="list-style-type: none"> <input type="checkbox"/> Preparing the cost sheet/ check list for individual trims required for a style. <input type="checkbox"/> Chasing the trim details from the buyer. <input type="checkbox"/> Submitting required trims to buyer for approval. <input type="checkbox"/> Provide booking for individual trims to the approved source. <input type="checkbox"/> Chasing the P/I from the most ensure ontime delivery. <input type="checkbox"/> Monitoring the B/B L/C or TT payment status. <input type="checkbox"/> Sourcing all trims form the most commercially viable source. <input type="checkbox"/> Follow up with suppliers to ensure ontime delivery. <input type="checkbox"/> Lialise with store in order to ensure all trims RCVD in correct quantity and quality.
----	---

ESTABLISHMENT	
06	<ul style="list-style-type: none"> <input type="checkbox"/> Chasing the correct artwork for all print/embroidery from buyer. <input type="checkbox"/> Develpping the design in the best possible method <input type="checkbox"/> Provide capacity booking to print /embroidery plant in advance. <input type="checkbox"/> Submitting print/embroidery strike off for buyer’s approval <input type="checkbox"/> Passing approved copy of the strike off to the print/embroidery plant. <input type="checkbox"/> Negotiating the price with the subcontractors. <input type="checkbox"/> Monitoring the panels sent and receive dates to ensure smooth production flow
FILING & CORRESPONDENSE	
07	<ul style="list-style-type: none"> <input type="checkbox"/> Maintaining style file for all running orders <input type="checkbox"/> Maintaing the development file. <input type="checkbox"/> General correspondence with buyer and suppliers. <input type="checkbox"/> Critical correspondence with buyer and suppliers <input type="checkbox"/> Weekly updates for buyer, such as audit schedule, production status et c.
MEETING	
08	<ul style="list-style-type: none"> <input type="checkbox"/> Meeting with foreign buyers and suppliers. <input type="checkbox"/> Meeting with local buyers and suppliers. <input type="checkbox"/> Internal meeting with production, planning, quality, commercial and

Different Section of Garments:

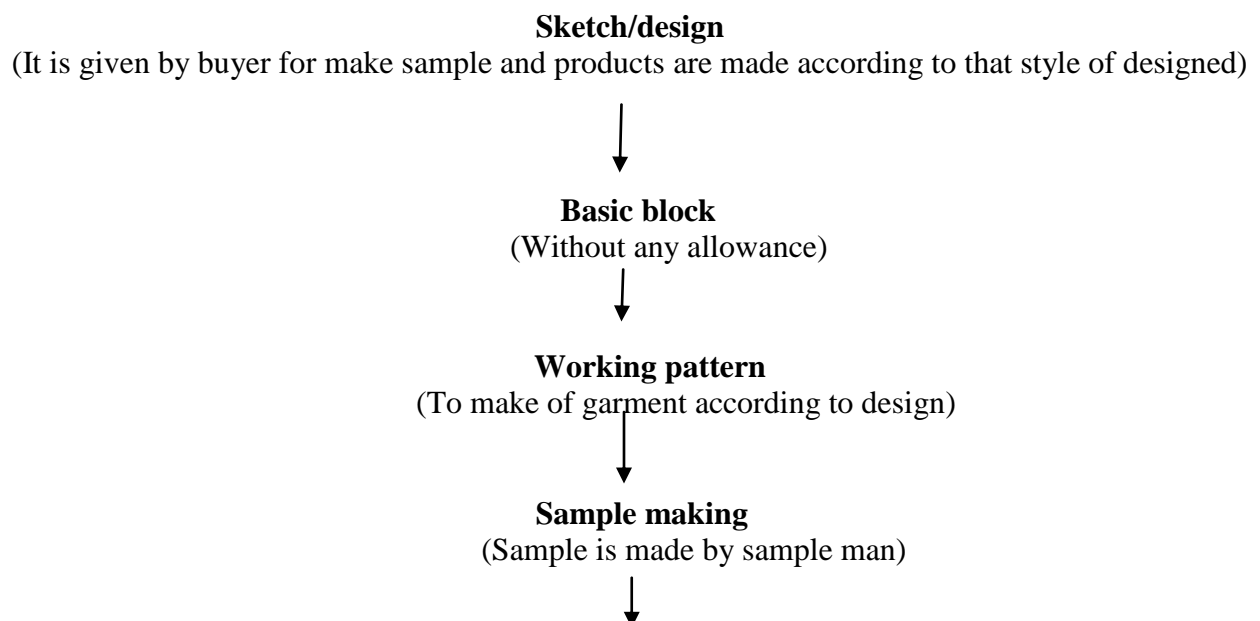
- ❖ **1. Sample section:** Sketch/design, pattern making, Sample making, basic manufacturing difference, Approved sample, costing.
- ❖ **2. Cutting section:** Production pattern, Grading, Marker making, Fabric spreading, Cutting, Bundling .
- ❖ **3. Sewing Section:** Sewing
- ❖ **4. Finishing Section:** Ironing, finishing, Final inspection, Packing, Cartooning, Shipment.

3.6.SAMPLE SECTION

Sample:

- The style done by designer or developer.
- Particular purchase order.
- Sample is the specimen of any product.
- Any revision to the style work.
- Sample is a specimen or we can say a part which shows that the whole is look like.
- Conform with any specific requirement
- Sample is the physical form of design.

3.6.1.FLOW CHART OF SAMPLE DEPARTMENT:



Basic manufacturing difference

(Critical path is identify)



Approved sample

(Sample approved by buyer)

❖ **Design or Sketch:**

It is nothing but one kind of engineering art including all measurement of particular style.

❖ **Basic Block:**

It is an individual component of garments without any design or style.

❖ **Working Pattern:**

To make pattern for a particular style with net dimension. .

❖ **Sample making:**

Sample is made on the basis of buyers sheet.

❖ **Approved Sample:**

The sample which is approved by buyer is called approved sample.

❖ **Send to Buyer:**

When all process is done, then the garments are sent to buyer.

❖ **Production Pattern:**

To make pattern for a particular style with net dimension along with allowances.

3.6.2.SAMPLE TYPE:

1. Development sample
2. Salesman Sample
3. Photo Sample
4. Approval Sample
5. Size set Sample
6. Mock up Sample
7. Pre-production Sample
8. Production Sample
9. Shipping Sample

The Details Attached to the Garment Sample:

After the confirmation of order, each sample sent to the buyer has the following details attached to it, with the help of a tag. It contains the details pertaining to both, what the buyer has demanded and what supplement fabric/trim etc they have used (if applicable).

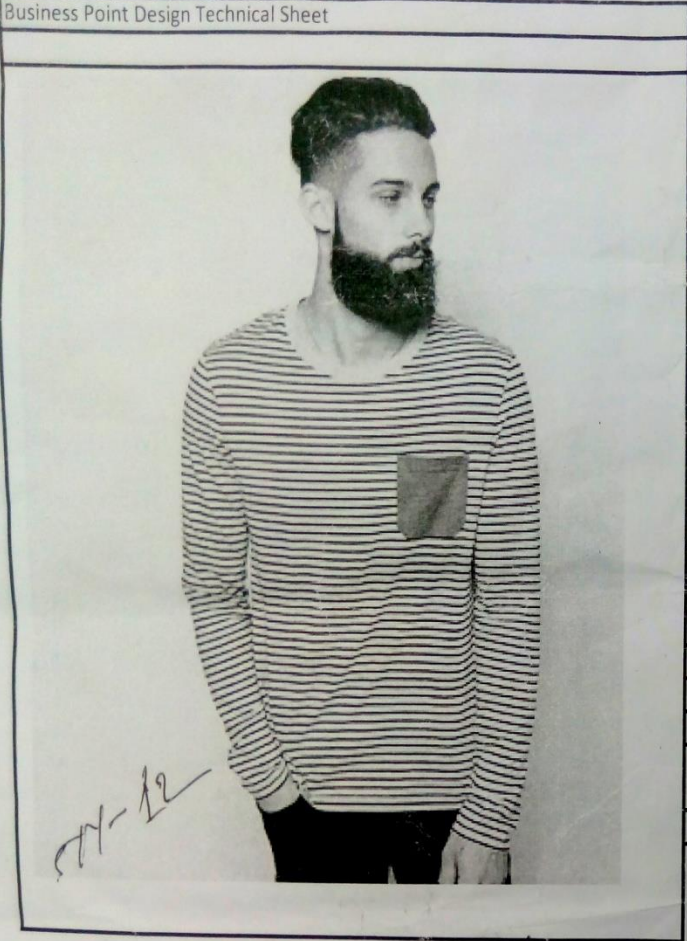
- ❖ Ref no.
- ❖ Color
- ❖ Fabric
- ❖ Composition
- ❖ Description
- ❖ Quantity
- ❖ Style no/ Size
- ❖ Store

There may be a separate sampling department in a company. But as the merchandiser is the person who is interacting with the buyers regarding samples and other requirements, this sampling department will work under the supervision of merchandising department. Also as the samples are to be made according to the buyers' price ranges and quality levels, merchandiser has to advise sampling department suitably.

3.6.3.SAMPLE ORDER SHEET

Sample order sheet With Size chart/Specification : 01

Business Point Design Technical Sheet




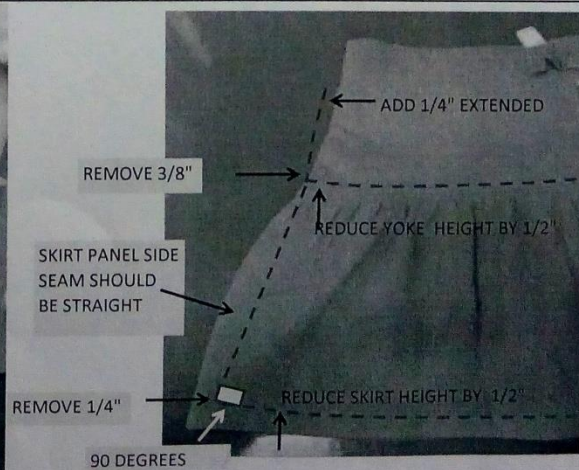
571-12

MID Navy

Size specification					
Size specification					
Meas point	M	S	M	L	XL
Chest		48	51	54	57
Hem		48	51	54	57
Bicep 2.5 cm u/A		19.5	20.5	21.5	22.5
Armhole		22	23	24	25
Shoulder		14.5	15	15.5	16
Sleeve length		65	66	67	68
Cuff width		9.5	10	10.5	11
Cuff opening		20	21	22	23
Front neck drop FIL		8.5	9	9.5	10
Back neck drop		2	2	2	2
Beck neck width		16.5	17	17.5	18
Collar rib depth		1	1	1	1
Length SNP to Hem		68	69	71	73
Hem depth		1.5	1.5	1.5	1.5
Neck rib depth		1.5	1.5	1.5	1.5
Fabric details					
140 GSM yarn dye strip cotton jersey					
Pocket dimensions 9 x 11					

Sample order sheet With Size chart/Specification 02:

	TYPE OF SAMPLE:	P.P SAMPLE APPROVED WITH CORRECTIONS		
	DATE:	9/26/2014		
	Technical Designer :	ISABELLE		
	STYLE:	X41182		
	CATEGORY:	GIRLS 3 TO 8 SKORT		
	SEASON:	SPRING 2015	SIZES:	3 TO 8
FABRIC 1:	100 % COTTON JERSEY		GSM:	150
FABRIC 2:			GSM:	
DESCRIPTION: LAYER PULL ON SKORT WITH FAKE BOW ELASTIC AT WAIST				
FLAT SPECS:				
	TOL+-	4	9/26/2014	
			P.P SAMPLE	REVISED
SKIRT				
1	WAIST WIDTH (AT TOP) RELAXED	3/8	10	10 1/8
2	WAIST WIDTH (AT TOP) EXTENDED	3/8	13 1/2	13 1/2
3	WAIST YOKE HEIGHT AT CF FROM WAIST SEAM	1/8	3 1/2	3 1/2
4	HIPS WIDTH AT YOKE SEAM	1/2	13 1/2	13 1/4
5	PANNEL HEIGHT FROM SEAM TO HEM	1/4	6 1/2	6 1/2
6	HEM WIDTH ALL AROUND HALF	1/2	21	21 1/4
7	WASTBAND LENGTH	1/8	1 1/2	1 1/2
SHORT				
8	WAIST WIDTH (AT TOP EDGE)	3/8	10	10 1/8
9	HIPS LEVEL(ABOVE CROTCH)	0	2 1/2	2 1/2
10	HIPS WIDTH	3/8	11 1/4	11 1/8
11	FRONT RISE(TO TOP EDGE)	1/4	6 3/8	6 3/8
12	BACK RISE(TO TOP EDGE)	1/4	8 1/4	8 1/4
13	THIGH (1" BELOW CROTCH)	1/4	6 1/4	6 1/4
14	LEG OPENING	1/4	5 7/8	6
15	INSEAM	1/4	2 1/4	2 1/4
COMMENTS				
ELASTIC AT WAIST IS TIGHT. PLEASE IMPROVE				
INCREASE WAIST EXTENDED BY 1/2" (1/2" BELOW WAIST BAND SEAM) TO HELP REMOVING HIPPY SHAPE				
REDUCE WAIST YOKE HEIGH BY 1/2" TO REVISED SPEC 3"				
REDUCE SKIRT PANNEL BY 1/2". NEW SPECS 6"				
REDUCE HIPS WIDTH AT SEAM BY 3/4" NEW SPECS 12 1/2"				
REDUCE SWEEP BY 1/2"				
THE SHAPE OF THE FRONT RISE IS NOT NICE. NEED TO BE MORE SCOOP. SEE PICTURE				
THE BOW ENDS MUST BE TURNED TWICE FOR A CLEANED FINISH. SEE PICTURE				
P P SAMPLE IS APPROVED WITH ALL CORRECTIONS. MAKE SURE TO APPLY ALL CORRECTION BEFORE YOU PROCEED WITH THE GOODS				



3.6.4.THE ENTIRE DEPARTMENT THOROUGHLY DISCUSSED IN FOLLOWING:

Pattern Making:

Pattern is the one of important element of a design. In a garment industries there are two type of pattern uses based on their capability. Mostly big companies are use CAD (Computer aided design) as well as little companies' uses manual pattern. In BGL & BDL use CAD also manual pattern in some cases. Basically **INVESTRONICA** Software uses here. There are 10-12 high skilled pattern masters working here.

Marker Section:

In BGL & BDL marker is made both manual system & automatic system. In computer aided marker BGL & BDL use **INVESTRONICA** software.

In manual marker making process, marker man use pattern paper to draw different garments parts in marker paper.



Fig: Marker making machine

3.7.CUTTING SECTION:

Fabric Spreading

Fabric spreading is very important part of the production process because it is basic for obtaining a high quality final product. Spreading is the process of unwinding large rolls of fabric onto long, wide tables in preparation for cutting each piece of a garment. The number of layers of fabric is dictated by the number of garments desired and the fabric thickness. Fabric Spreading Machines are used for bulk production.

3.7.1.OBJECTIVES OF SPREADING PROCESS:

- ❖ -Understanding the process of fabric spreading
- ❖ Factors affecting spreading
- ❖ Face and nap of the fabric

Number of plies depends on:

- 1.Capacity of the cutting machine.
2. Volume of production.
3. Type of fabric itself (rough or slippery).
4. Thickness of fabric.

$$\text{Total Piles spread} = \frac{\text{No. of garments spread}}{\text{No of garments in marker}}$$

Types of Fabric Spreading:

3.7.2.TYPES OF SPEREADING:

1. Flat spreads- all plies are of the same length.
2. Stepped spreads- this as the name suggests, is built up in steps, with all the plies in one step having the same length. A stepped spread is generally used when the quantities to be cut precludes the use of a flat spread. The cut order plan details the colors and ply lengths for a stepped spread, if it is needed.



Fig: Auto Spreading Machine

3.7.3.REQUIREMENTS OF SPREADING PROCESS:

1. Alignment of plies in both length and width direction- **length and width of fabric must be at least equal to marker length and width.**
2. Elimination of fabric defects/flaws- **any faults identified on the incoming fabrics will be tagged and will be avoided.**
3. Correct ply direction (especially for asymmetrically printed fabrics)- **all faces up, all faces down, face to face etc.**
4. Correct ply tension- **ply tension must be uniform and as much less as possible.**
5. Avoidance of distortion in the spread during cutting- **polythene sheets are used under the bottom ply to resist friction of the bottom ply with the base plate of the knife.**
6. Fabrics must be flat and free from any crinkle & crease- **these cause defect in garments due to variation in dimension.**

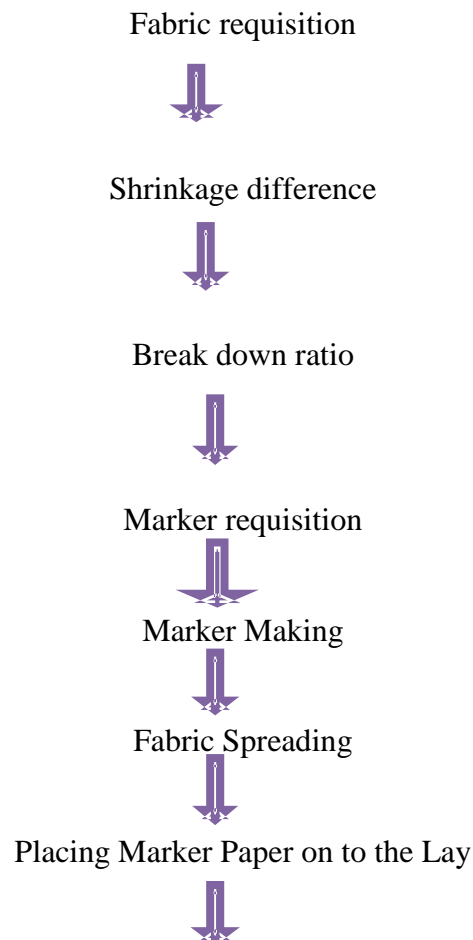
Fabric Cutting :

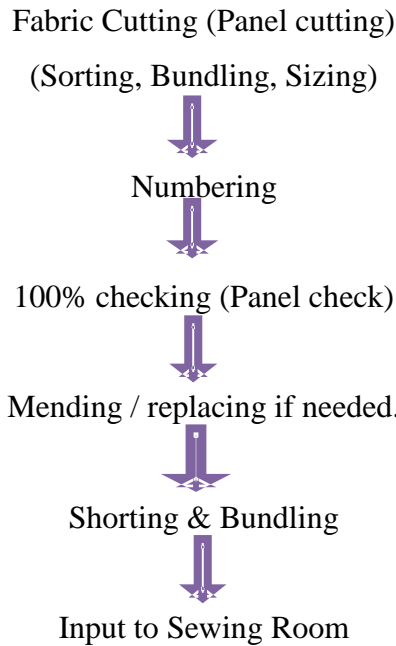
Cutting is the major operation of the cutting room, when the spread fabric is cut into garment components. Of all the operations in the cutting room this is the most decisive, because once the fabric has been cut, very little can be done to rectify serious mistakes. Cutting can be done manually using powered knives or by computer-controlled system.

Ideal Lay height of Cutting :

Heavy Weight	4-5"	5-4"
Med Weight	3-4"	3-3.5"
slights Weight	2.5-3"	2-2.25"

3.7.4.PROCESS SEQUENCE IN CUTTING ROOM





3.7.5.FACTORS AFFECT THE CUTTING PROCESS FOR FABRICS ARE AS FOLLOWS:

- ❖ Nature of fabric (grain line shade, twill etc.)
- ❖ Thickness of fabric.
- ❖ Design characteristics of finished garment.
- ❖ Machines and tables used.

3.7.6.TYPES OF CUTTING MACHINE:

There have three types of cutting machine.

1. Manual:
 - Die cutting
 - Drill cutting
 - Hand operated cutting scissor
2. Manually operated power knife:
 - Straight knife cutting m/c
 - Round knife cutting m/c
 - Band knife cutting m/c
3. Computerized cutting
 - Knife
 - Water jet
 - Laser
 - Plasma torch

Straight knife, Round knife, Band knife cutting machine are used in Rupashi Garments.

Straight Knife Cutting M/C:

This is designed with a low center of gravity for ease of handling and features the best power to gravity weight ratio in the industry.

Features of Straight knife cutting machine :

- ❖ Automatic sharpening system
- ❖ 8” blade size
- ❖ Low-profile ergonomic design
- ❖ 1-1/2” stroke

Some advantages from others which are follows:

- ❖ Comparatively cheap
- ❖ Can be transferred easily
- ❖ Easily operated
- ❖ Round corner can cut smooth easily
- ❖ Fabric can be cut from any angle
- ❖ Directly garments components separated from fabric lays
- ❖ Properties of Straight Knife Cutting Machine:
- ❖ Directly cut the pattern pieces from the fabric lays
- ❖ Could be used to cut for higher depth of fabric
- ❖ Cutting speed high
- ❖ Sharp and heavy corners can be cut
- ❖ Blade is very sharp



Fig: Straight Knife Cutting Machine

Round knife:

Round knife is mostly use for cutting the big parts of the garments pattern.

Advantage of round knife:

- Round knife is widely used to separate the big parts and separate the blocks of fabric from relatively small height fabric lay.

Disadvantage of round knife:

- Not suitable for cutting very curved lines in higher number of lays as the blade does not strike all the piles simultaneously at the same point.
- Round knife is used only for straight line & lower number of piles.
- Not suitable for higher production.
- Possibility of accident is high.
- Difficult to cut small components

Band knife:

Band knife cutting machine is look like a wood cutter machine. Band knife is used for precession cutting small parts of garment.

Features of band knife:

- Band knife are used when a higher standard of cutting accuracy is required.
- Consistent cutting is possible by using the templates.
- Possible to cut in 90 angle of the fabric.

Specification of straight knife cutting machine:

Brand Name	Mack
Origin	Japan
Frequency	50/60 Hz
Volt	50/60 Hz
Phase	1
Blade	Straight bar blade
Speed	3000/3600
Current	AC

3.7.7.FACTORS CONSIDERED FOR CHOICE OF CUTTING:

Type of the fabric: Technique should be such as that it should not damage the fabric. In case of natural fiber fabric, all methods may be applied, but Laser and Plasma method is not suitable for Man Made Fiber fabric.

Accuracy of cutting: for higher accuracy, computerized method may be adapted & for lower accuracy, manual technique may be suitable.

Available of cutting machine: machine is available to suit the cutting technique.

Volume of cutting: For small amount of cutting, round knife is suitable and for large volume of cutting, straight knife is suitable.

Quality of cutting: Computerized cutting methods are suitable for high quality fabric cutting and manually operated powered knife is suitable for comparatively lower cutting quality.

Time factor: For urgent requirement of fabric cutting, straight knife is more suitable as that technique requires comparatively less preparatory time.

Numbering:

Sorting out the components according to size and for each size make individual bundle.

Bundling:

Bundle Card:

The bundle card is most important in the garments section. In export quality garments any type of shading and size mistake is not accepted, so it is used. Because buyer can not accept any types of shading and size mistake garments.

Required information in a Bundle card:

C- 7	:	Cutting number Seven.
723	:	Bundle Number.
HPB	:	Hammer pocket big.
1912-1936	:	Lay number.
5TE	:	Size.
Quantity	:	25 pcs

Factors involved in Cutting Fabrics:

Factors affect the cutting process for fabrics are as follows:-

- Nature of fabric (grain line shade, twill etc.)
- Thickness of fabric.
- Design characteristics of finished garment.
- Machines and tables used.

Requirements of the Cutting Process:

1. Precision of cut- It depends on:

- Methods of cutting employed.
- Marker planning- distance between two pattern pieces.
- Marker marking- correct marking by pen/pencil.
- Condition of cutting equipment- machine, blade etc.
- Skill and motivation of the operator.

2. Clean edge- Free from fraying.

3. Un fused edge- High temperature produced during cutting can fuse fabric edges by melting. Unfused edges can be ensured by taking the following measures:

- Well sharpened blade.
- Use of anti-fusion (heat absorbent) paper.
- Spraying silicon lubricants on the blade.
- Less cutting speed.
- Reducing the height of the lay.

4. Support of the lay- using a polyethylene sheet or nylon bristle under the bottom ply

5. Consistent cutting- all plies should be of same dimension

3.8.EMBROIDERY

3.8.1.EMBROIDERY AND EMBROIDERY THREADS:

The art or process of forming decorative designs with hand or machine needlework is called Embroidery. Embroidery is an ancient variety of decorative needlework in which designs and pictures are created by stitching strands of some material on to a layer of another material. Most embroidery uses thread or wool stitched onto a woven fabric, but the stitches could be executed in, for example, wire or leather strands, and embroidery can be worked onto many materials. Non-woven traditional materials include leather and felt, but modern textile artists embroider on many non-traditional materials such as plastic sheeting.

DIFFERENT TYPES OF EMBROIDERY THREADS:

Rayon, polyester, cotton, silk, metallic or rock thread are used in embroidery. All have their pros and cons. Rayon and polyester are the most common embroidery threads. Always choose a good quality thread to ensure the best results for embroidery.

3.8.2.DIFFERENT TYPES OF STITCHING IN EMBROIDERY:

- ❖ Chain stitch
- ❖ Running stitch
- ❖ Zig-Zag stitch
- ❖ Satin stitch

Number of Embroidery Machine: 09. Each m/c has 20 head.



Fig: Embroidery Machine

Needle Type: DB X K5 #9/Nm 65~#16/Nm 100.

Rayon Threads:

Rayon embroidery threads are currently the most popular thread used in embroidery machines. They perform consistently well in high-speed embroidery machines with very little breaking or fraying. Rayon is a high sheen thread, and often used as a lower cost alternative to silk threads. Most Rayon embroidery threads are available in 40wt, though 30wt can be found without effort. A wide range of colors and shades are available, including variegated colors. Though some brands can be, rayon embroidery threads are not generally colorfast. It is best to avoid using any bleaching agents, including those made for colors. Stitches sewn with rayon threads are very smooth and consistent, leading to a higher quality embroidery project. Rayon threads do deteriorate over time, so attention should be paid to how it is stored. In low humidity regions, rayon threads can be stored in the refrigerator to extend thread life for as long as possible.

Advantages of Rayon:

- ❖ High sheen.
- ❖ Softer
- ❖ Relatively heat resistant.
- ❖ Less elasticity than polyester.

Disadvantages of Rayon:

- ❖ Not colorfast.
- ❖ Not as strong as polyester.
- ❖ Less durable than polyester.

Polyester Threads:

Polyester embroidery thread is the popular and economical choice. It is available in a wide assortment of colors, and your results will be similar to that of rayon. The benefit of polyester is that it won't shrink, fade or bleed. Like rayon thread, polyester thread is strong and won't easily break or fray.

Polyester thread is synthetically produced from polymer resins. It can be made with a matte finish to look like cotton, with a medium sheen, or high sheen finish to look like rayon or silk. Trilobal poly is higher quality polyester with sheen equal to rayon and is lint free. Due to its strength and color fastness polyester is becoming one of the most popular embroidery threads available these days.

Types of polyester Thread:

There are three types of polyester thread:

- ❖ Spun poly: fiber staples spun together. Looks like cotton.
- ❖ Filament poly: continuous fiber.
- ❖ Trilobal poly: high-sheen continuous fiber. Looks like rayon or silk. Lint Free.

Advantages of Polyester:

- ❖ Durable. Designed for heavy duty use.
- ❖ Strength. More tensile strength than rayon or cotton.
- ❖ Colorfast.
- ❖ Retains shape.
- ❖ Recovers stretch.

Disadvantages of Polyester:

- ❖ More elasticity than rayon.
- ❖ Lower temperature tolerance than rayon.

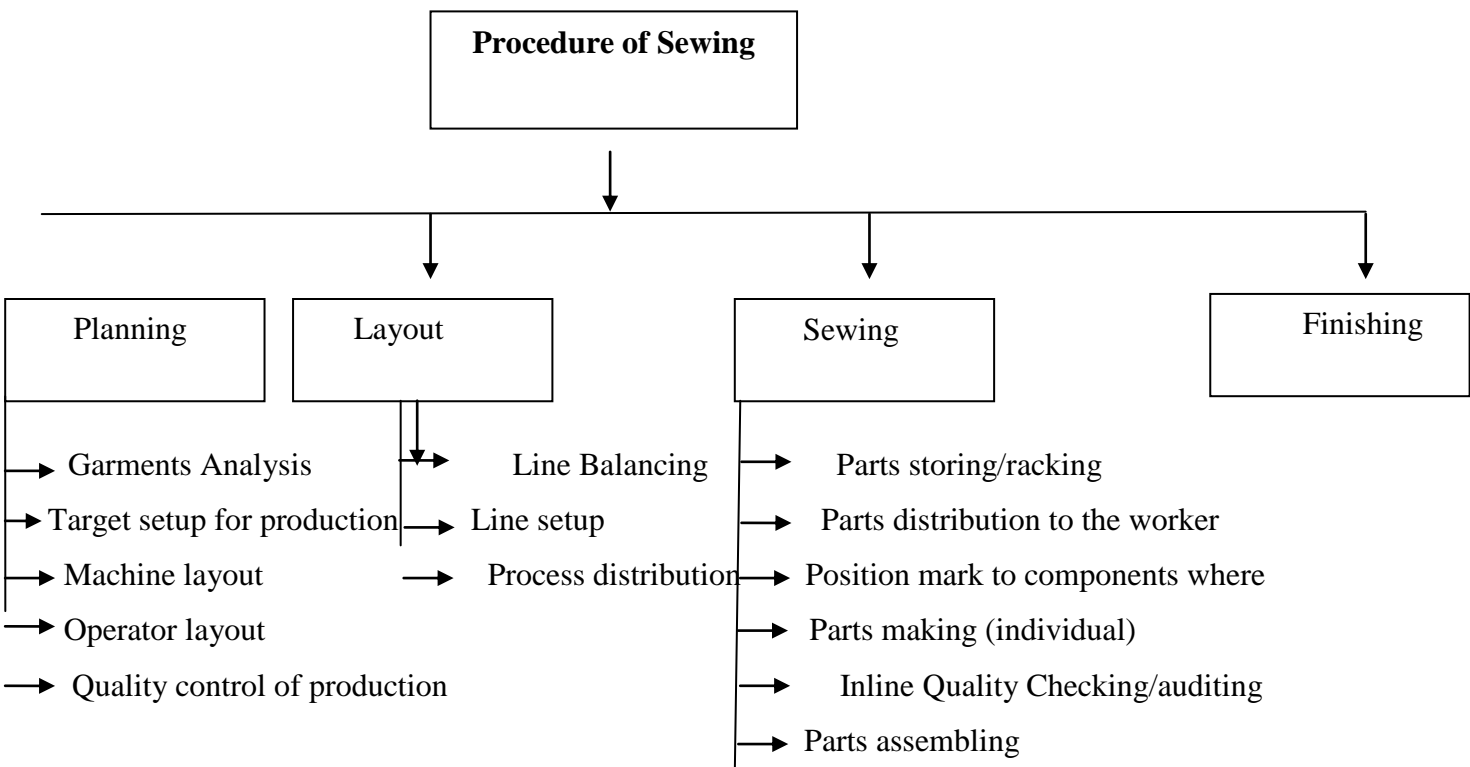
3.9.SEWING SECTION:



Sewing:

This is the main assembly stage of the production process, where sewers stitch fabric pieces together, and a garment is assembled. Computerized sewing machines (costly), can be programmed to sew a specific number of stitches to perform a standard operation, such as setting a zipper or sewing a collar

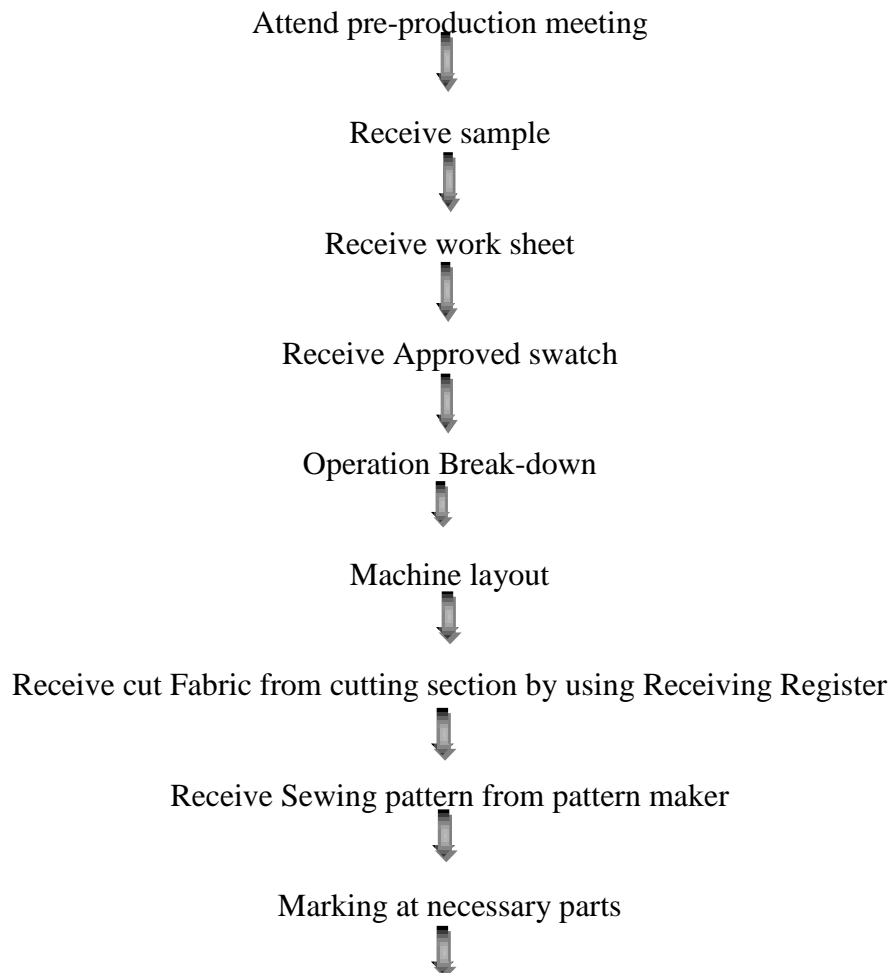
3.9.1.PROCESS SEQUENCE OF SEWING SECTION:

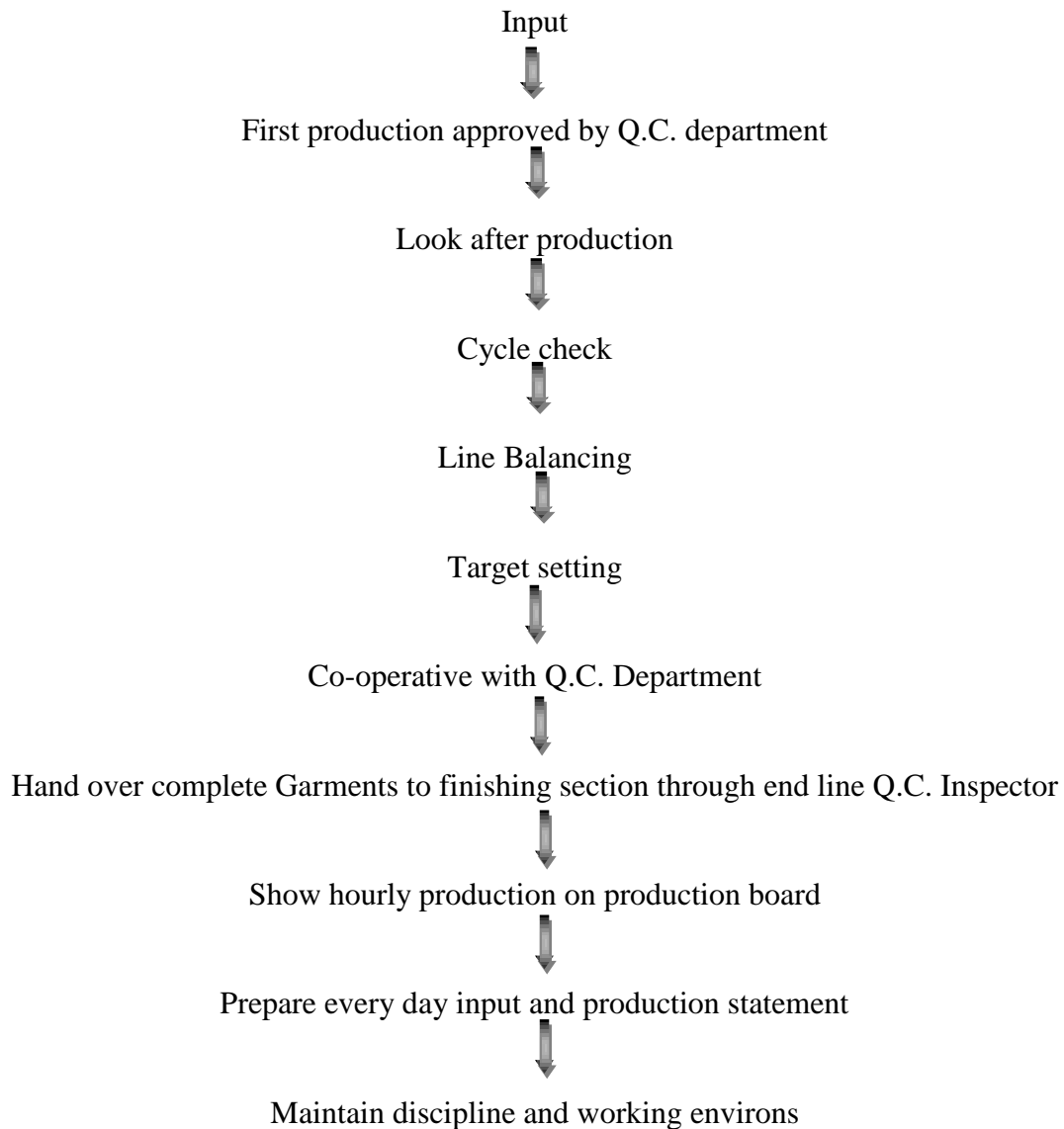


3.9.2.NAME OF MACHINE USED IN SEWING SECTION:

- ❖ Flat lock sewing machine
- ❖ Plain sewing machine
- ❖ Over lock sewing machine
- ❖ Banding machine
- ❖ Neck rib cutting machine
- ❖ Feed of the arm machine
- ❖ Button hole machine
- ❖ Button attaching machine
- ❖ Smoking m/c

3.9.3.ACTIVITIES OF SEWING SECTION:





3 Different types of stitches:

The two main stitches that sewing machines make of which the others are derivatives are lockstitch and chain stitch...

- ❖ back tack
- ❖ backstitch - a sturdy hand stitch for seams and decoration
- ❖ basting stitch (or tacking) - for reinforcement
- ❖ blanket stitch

- ❖ blind stitch (or hem stitch) - a type of slip stitch used for inconspicuous hems
- ❖ buttonhole stitch
- ❖ chain stitch - hand or machine stitch for seams or decoration
- ❖ cross-stitch - usually used for decoration, but may also be used for seams
- ❖ lockstitch - machine stitch, also called straight stitch
- ❖ overhand stitch
- ❖ over lock
- ❖ pad stitch
- ❖ padding stitch
- ❖ running stitch - a hand stitch for seams and gathering
- ❖ sail makers stitch
- ❖ slip stitch - a hand stitch for fastening two pieces of fabric together from the right side without the thread showing
- ❖ stretch stitch
- ❖ tent stitch
- ❖ topstitch
- ❖ whipstitch (or over sewing or overcast stitch) - for protecting edges
- ❖ zigzag stitch

3.9.4.DESCRPTION OF DIFFERENT TYPE SEWING MACHINES:

Plain machine:

Application:

- ✓ Bottom hemming
- ✓ Belt top seem stitch
- ✓ Belt joint stitch
- ✓ Loop tack stitch
- ✓ Pocket joint stitch
- ✓ Zipper joint
- ✓ Flap top stitch
- ✓ Flap joint
- ✓ Fly top stitch

- ✓ Flap 1/4 stitch
- ✓ Front rise stitch
- ✓ Back rise stitch



Fig: Plain Stitching Machine

**Over lock machine:
Applications:**

- ❖ Over lock stitch



Fig: Over Lock Machine

Bar tack m/c:

Applications:

- ✓ To created bar tack stitches in garments.
- ✓ Loop attach
- ✓ Fly make
- ✓ Pocket side
- ✓ Front side
- ✓ Back pocketing
- ✓ zipper lay
- ✓ In seem

Flat lock

Applications:

- ❖ Zigzag stitch
- ❖ Knit hemming
- ❖ Loop making

Chain stitch machine:

Applications:

- ✓ Back rise stitch
- ✓ Back yoke stitch
- ✓ Top sin $\frac{1}{4}$ stitch

Feed of the arm machine:

Applications:

- Back rise stitch
- Inseam stitch
- Back yoke top sin
- Side top sin

Button Attach m/c:

Component:

- ❖ 2 thread
- ❖ 1 needle
- ❖ Contains shoulder, shoulder Cap bobbin catching

Applications:

- ✓ To attach button in garments .

3.9.5.MACHINE WISE SEWING THREAD CONSUMPTION (FOR 1"STITCH) :

Machine wise sewing thread consumption per inch are gives in bellow:

Machine	No. of needle	Thread consumption per inch
Plain	1	2.5"
Plain	2	5"
Over lock	3	16"
Over lock	4	18"
Over lock	5	21"
Bar tack	-----	7"---8"
Button hole stitching	-----	6"—7" normally per hole
Button attaching 2 hole	-----	4" per button
Feed off the arm	-----	4 "per one needle
Kanshai Stitching	-----	4" per one needle
Back tape stitching		7 "per one needle

3.9.6.DIFFERENT TYPE OF SEWING FAULT:

1. Skip/ Drop stitch
2. Uneven stitch
3. Over stitch
4. Joint stitch
5. Raw edge
6. Tension loose
7. Broken stitch
8. Puckering
9. Open stitch
10. Oil spot
11. Shading
12. Incorrect stitch per inch
13. Pleat
14. Needle cut
15. Wrong Thread

- 16. Wrong size/ care label
- 17. Slanted
- 18. Wrong button placement
- 19. Run off stitch
- 20. Etc

Factors Affecting Appearance of Seam: The technique and skill of the sewing machine operators also govern the appearance of sewn seams. Some of the factors that will adversely affect the appearance of a seam.

Stitch Defects	Seam Appearance Defect
Loose Stitches	Puckers
Poorly formed stitches	Twists
Crowded stitches	Plaits
Tight stitches	Undulations
Crooked stitches	Run-off (raised seams)
Skipped stitches	Raw edges exposed (felled seams)

3.10.GARMENTS FINISHING SECTION

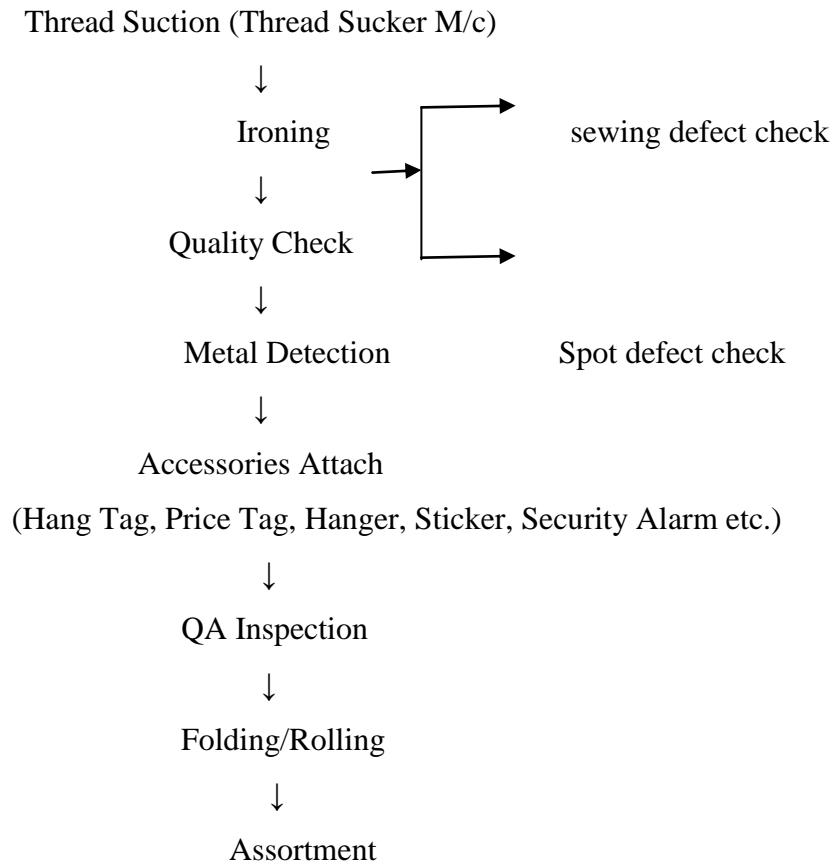
Finishing:

Finishing is a series of processing operations applied to a textile material to improve it’s appearance, handle and functional properties.

Garments Finishing:

Garment finishing through wet processing is responsible for adding beauty to the garment. Proper finishing could provide better look to the garment, change the feel of the fabric and bring about a change to the texture of the fabric. There are various types of finishes like peach finish, anti-microbial finish, wrinkle free finish, aroma finish, UV guard finish, acid wash, enzyme wash, etc.

3.10.1.PROCESS FLOW CHART OF GARMENT FINISHING:



3.10.2.OBJECT OF FINISHING:

- To enhance the suitability of the fabric for end use.
- To improve appearance and sale appeal for comfort and utility.

To give desirable qualities to the fabric like-

1. Softness
2. Luster
3. Drape
4. Dimensional stability
5. Crease recovery
6. Soil repellence

Work flow in the Finishing Room:

As mentioned earlier, workflow in the Finishing Department is shown here for reference:

- Eliminate micro-dust and residual thread from the garment;
- Press/iron garments as specified by buyer or as per requirements;
- Fold the garments as required by customer;
- Fix necessary tickets (Price tickets) or tags (hang tags),etc to the garments at this stage;
- Insert garments into poly bags;
- Divide garments as per size and color (assortment);

3.10.3.MACHINE DESCRIPTION OF FINISHING SECTION:

Machine	Number
1. Heat Iron	06
2. Steam iron	029
3. Metal detector	02
4. Neck press	02
5. Thread sucker	03

3.10.4.MATERIALS USED IN GARMENT FINISHING:

- Neck board
- Back board
- Fit label
- M-clip
- T-clip
- Metal clip
- Cuff link
- Droop loop
- Cable tie
- Boa tie
- Full board
- Hand tag
- Tag pin

- Tissue paper
- Al pin
- Ball pin
- Elastic clip
- Hanger
- Poly bag
- Size sticker
- Gun tap
- Inner box
- Muster cartoon box
- Pp belt
- Blister

The General Rules of Spot Removing:

1. The longer a stain remains, the tougher it is to remove.
2. Always treat a stain before laundering.
3. Blot gently — never rub; and don't ever blot with hot water.





Stain Removal:

STAIN TYPE	USED CHEMICAL (COMMERCIAL NAME)
1. Oil stain	Spot lifter
2. General stain	Thinner
3. Termeric stain	MRS
4. Ink stain	MR
5. Glue stain(Polymer based)	Heat gun
6. Rust stain	Markvill
7. Print mark	Printvill

Ironing:

Ironing is the use of a heated tool (an *iron*) to remove *wrinkles* from fabric. The heating is commonly done to a temperature of 180–220 °Celsius, depending on the fabric. Ironing works by loosening the bonds between the long-chain *polymer molecules* in the fibers of the material. While the molecules are hot, the fibers are straightened by the weight of the iron, and they hold their new shape as they cool. Some fabrics, such as cotton, require the addition of water to loosen the intermolecular bonds.

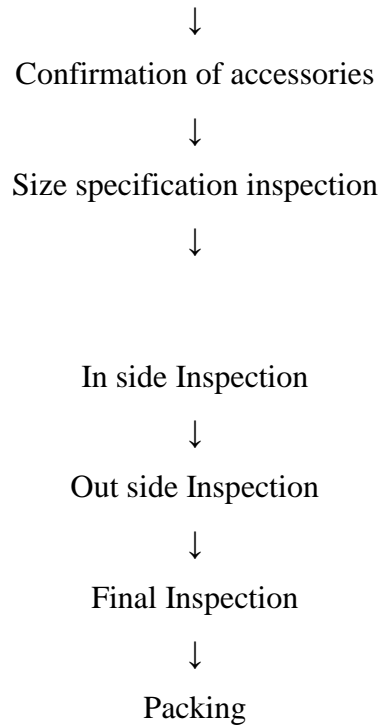
3.10.5.BASIC IRONING SYMBOLS:

	Do not iron
	Cool iron (110°)
	Medium iron (150°)
	Hot iron (200°)

3.10.6.GARMENT INSPECTION:

Flow Chart of Garment Inspection

Confirmation of Quantity



Inspection Procedure of Garments :

Confirmation of Quantity:

First step of garment inspection start with confirmation of Quantity with the vendors packing list by counting all Pecs of each box. If Qty is not matching to the packing list and written in the box then this discrepancy is informed to the vendor.

Confirmation of Accessories:

Next step is the confirmation of accessories, here we confirm brand tags, demerit tags, Price tags, or other tags, wash care labels, woven labels, or other labels and accessories as required by the buyer.

Size Specification inspection:

After confirmation of accessories all pieces are checked as per size specification based on the instruction sheet which is given by the buyer side. If any measurement problem is noticed then we check the original sample and inform the buyer same time.

In Side Inspection:

At this stage garment is checked from reverse side to ensure that there is no fabric defect, poor stitching, and stains etc. in the garment.

Out Side Inspection:

At this stage garment is checked from outside to ensure that there is no color variation, weaving defect, fabric defect, printing defect, holes, poor stitching, bad smell , dying defect and stains etc in the garment.

Final Inspection:

Final Inspection stage is the most important part of inspection process, here garment is rechecked to confirm that inspection is done properly without missing any checking step if any defect is noticed we put it into rejection bin or send it for repay.

Packing:

All “Grade-A” goods are put back into poly bags as per the original packaging

Different type of folding:

- ❖ Standard folding

- ❖ Semi standard folding

- ❖ Flat folding:
 - Roll folding
 - Hang folding
 - Half folding
 - Eco folding
 - Twill folding

Packaging:

After final inspection, the garments are poly-packed, dozen-wise, color wise, size ratio wise, bundled and packed in the cartoon. The cartoon is marked with important information in printed form which is seen from outside the cartoon easily.

Cartooning procedure:

There are 4 types of cartooning assortment:

- 1) Solid size and solid color (the order comprises one size & one color)

- 2) Solid size & assorted color (the order comprises one size & different colors)
- 3) Assortment sizes & assorted color (the order has only one color but different sizes)
- 4) Assorted sizes & assorted color (different sizes & different colors in the order)

Dispatch:

The cartoons of the manufactured garments are delivered or placed in the dispatch department or finished product Go down, from where the garments lot is delivered for shipment

3.10.7.QUALITY MANAGEMENT SYSTEM

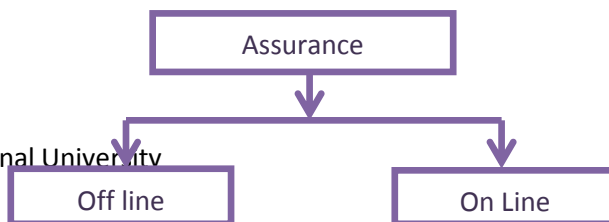
Quality Assurance:

Quality assurance (QA) refers to the planned and systematic activities implemented in a quality system so that quality requirements for a product or service will be fulfilled. It is the systematic measurement, comparison with a standard, monitoring of processes and an associated feedback loop that confers error prevention. This can be contrasted with *quality control*, which is focused on process outputs.

Objective of quality control:

- Research
- Selection of raw material
- Process control
- Process development
- Product testing
- Specification check

Quality Management system:



Online Quality assurance test:

The entire online QA test for finished fabric of BGL & BDL can be grouped as-

- Pattern measurement
- Marker making
- Fabric spreading
- Cutting check
 - Fabric fault
 - Shade variation
 - Size measurement
 - Cutting pieces matching
- Sewing inspection
- Packing & finishing

Offline Quality assurance test:

The entire offline QA test for finished fabric of BGL & BDL can be grouped as-

- **Physical test**
- **Chemical test**

The detail of all application QA test for finished fabric are discussed in bellow-

➤ **Physical test:**

The applicable QA physical test for finished fabric is as follows-

- Tensile strength test
- Tear strength test
- Abrasion resistance test
- Pilling resistance test
- Crease resistance test

Flow diagram of Off-line quality control for each production:

Inspection fabric in the inspection machine



Fabric lot no.



Buyer's order No check



Style No. check



Product quality check according to buyer's requirement



Inspection and testing of the produced garments

Flow diagram of On-line quality control:

Raw material inspection



Pattern making inspection



Marker making inspection



Cutting inspection



Sewing inspection



Pressing and finishing inspection



Packing and cartoning inspection

In process QC in sewing section:

Seam joint of two parts



Seam damage



Slipped stitch



Staggered stitch



Unbalance stitch



Stitch density



Needle, looper thread breakage



Fabric distortion



Fabric damage through the stitch line



Label attaching place



Check label



Check oil mark



Shading of different garment parts

3.11. WASHING

The process which is used to change the appearance, outlook comfort ability and fashion of the garments & also help to remove dirt is called garment washing. There are various types of washing process are occurred in a washing section.

3.11.1. ORGANIZATION OF WASHING SECTION :

- ↓ Executive Director
- ↓ General Manager
- ↓ SR. Manager
- ↓ Production manager
- ↓ In charge
- ↓ Supervisor
- ↓ Operator
- ↓ Helper

3.11.2. NUMBER OF MACHINE IN WASHING

Machine Name	No. of machine
Washing m/c	09
Deep dyeing m/c	04
Tumble dryer	10
Hydro-extractor	03
Sample washing m/c	02

Depending on garments construction different types of washing process can be done.

1. **Twill/Canvas/Knitted** - Normal wash, pigment wash, Caustic ,Silicon wash
2. **Denim/Jeans/Gabardine** - Enzyme wash, Stone wash, Bleach wash , Acid wash
3. **Grey fabric**- Super white wash



Fig: Garments Washing Machine

3.11.3.OBJECTIVE OF GARMENTS WASHING:

Garment washing is the best touch of a garment. Same type of garments can produce several effects for several wash. Like this:

1. To create wash look appearance, seems the new touch of fashion.
2. By the washing technique, faded/old, color or tinted affect .
3. Washing technique creates new fashion such as tagging, grinding, destroy, blasting, whickering, permanent wrinkle, deep dye, tie dye, p.p spray, hand crapping, p.p spoonzing etc.
4. To reduce size materials that imports soft hand feels.
5. To attraction the customers/buyer by different types of fashionable washing and market development.

6. Due to washing, shrinkage occurs in the garments. There is no possibility of further shrinkage of the wash garments.
7. Any dirt, spot or germ if added in the garments during manufacturing is also removed due to washing.

3.11.4.TYPES OF WET PROCESS IN WASHING:

- ❖ Normal wash
- ❖ Heavy garments wash
- ❖ Enzyme wash
- ❖ Stone Enzyme wash
- ❖ Stone bleach wash
- ❖ Acid wash
- ❖ Caustic wash

3.11.5.TYPES OF DRY PROCESS IN WASHING:

- ❖ P.P spray
- ❖ P.P sponging
- ❖ Whiskering
- ❖ Wrinkle Finish
- ❖ Destroy
- ❖ Tagging

POTASSIUM PER MANGANET (P.P) SPRAY:

- This process is called in brief P. P spray
- At first a solution is made by potassium permanganate & water
- Sometimes CH_3COOH (acetic acid) is used for solution preparation
- A spray gun machine is used for spraying the P.P solution
- Spray gun m/c spray the solution as per requirement
- A few minutes later reddish color is found on the surface of garments
- Then garments sent for further processing

GRINDING:

- ❖ →Grinding is done by grinding machine
- ❖ →Due to abrasion selected area of garments
- ❖ become
- ❖ smooth
- ❖ →Grinding is done at pocket corner, belt loop,
- ❖ and
- ❖ bottom hem.
- ❖ →After grinding garments are sent for
- ❖ further
- ❖ Processing.
- ❖
- ❖
- ❖

DESTROY:

- ❖ →This process is done manually
- ❖ →Glass pencil/blade is used in this process
- ❖ →Destroy is done on specific area of garments
- Destroying warp yarn by blade gives new outlook
- ❖ →Garments sent for further processing.

.TAGGING:

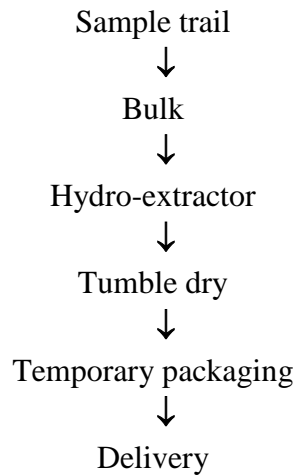
- In this process tag pin is used
- ❖ →At first garments are clipped with tag pin by
- ❖ tagging
- ❖ machine
- ❖ →Then after wet wash tag area of garments remain
- ❖ color
- ❖ than surrounding area.
- ❖ → sometimes tagging is done

3.11.6.TYPES OF DYEING IN WASHING:

- ❖ Pigment dyeing
- ❖ Sulphur dyeing
- ❖ Deep dyeing

❖ Cool dyeing

3.11.7.STANDARD WASHING PROCEDURE:



Washing Procedure:

Normal Wash

Normal wash 5 min @ 40c with 1:10 Material: Liquor ratio.

Heavy garments wash

Here 10-20 min wash @ 30-40 c by 1:10 Material: Liquor ratio with silicon softener.

Enzyme wash

Here 10-20 min wash @ 55 c by 1:10 Material: Liquor ratio with powder enzyme at pH 4.5 . Due to liquid enzyme 10-20 min wash @ 75 c by 1:10 Material: Liquor ratio at pH 4.5 .

Stone Enzyme wash

Like as enzyme wash just adding stone during wash.

Acid Wash

Solution of stone and potash (5g/l) with garments, wash for 20-30 min.

3.11.8.LIST OF CHEMICALS:

Normal wash: Detergent.

Caustic wash: NaOH.

Pigment wash: Detergent, NaOH, Soda Ash.

Bleach wash: Bleaching Agent

Enzyme wash: Enzyme

Acid wash: Acid, CH_3COOH , H_3PO_4 , KMnO_4 .

Super white: Optical Brightner.

Stone Bleach wash: Stone + Bleaching Agent.

7 FUNCTION OF CHEMICALS USED IN WASHING:

ENZYME:

- The action of enzyme during enzyme wash it hydrolysis the cellulose
- At first it attacks the having projecting fibers & hydrolyzed them
- Then it attacks the yarn portion & partly hydrolyzed them
- As a result color comes out from yarn portion & faded effect is produced

DETERGENT:

- The main function of detergent is to remove impurities, mineral oil contamination
- Temperature helps detergent to enhance it's action
- During washing some impurities, dye will be washed out & faded effect will be produced on the surface of garments

ACETIC ACID:

- To neutralize the alkaline condition of garment

→To control p^H value in wash bath.

ANTISTAIN/ANTICREASE:

→To prevent the staining of weft yarn on the denim, white pockets of garments levels & contacted fabrics of garments is the main function of anti staining agent .

→It is also used for increasing brightness of fabric.

BLEACHING AGENT:

→Bleaching agent is an oxidizing agent.

→It is used for colour out from denim garments.

→We can achieve different shade (dark, medium, light) from garments by this agent.

SODIUM HYPOSULPHITE:

→Sodium hyposulphite is used to neutralize the garments from chlorine Bleach.

CAUSTIC SODA:

→It is used for neutralizing acidic materials.

→It is also used for saponify glycerides & solubilize silicate.

→It created the role in bleach technique without color change the gts. →It is more powerful than Soda Ash.

SODA ASH:

→Soda ash create alkaline medium in wash bath.

→It help to uniform bleaching action in bleach bath.

→It has cleaning power &help color fading affect of garments

→It is used for color fixing in dye bath

→It is also used for maintaining p^H of wash bath

SODIUM BICARBONATE:

→It is used with bleaching powder in bleach bath for making light shade

POTASSIUM PERMANGANATE:

→It is used for discolorations of fabric

SOFTENER (cationic, nonionic):

→It is used to make the garments soft

→It also provides excellent lubricating properties

SODIUM CHLORIDE:

→It helps to exhaust dye in to the fiber

HYDROGEN PEROXIDE:

→ H_2O_2 creates the prime role in bleach wash technique

→In alkaline medium H_2O_2 breaks up and gives some perhydroxyle ion

→Hydrogen per oxide is used in scouring, bleaching bath to occurbleaching action for white/ready for dyeing of gray fabric garments

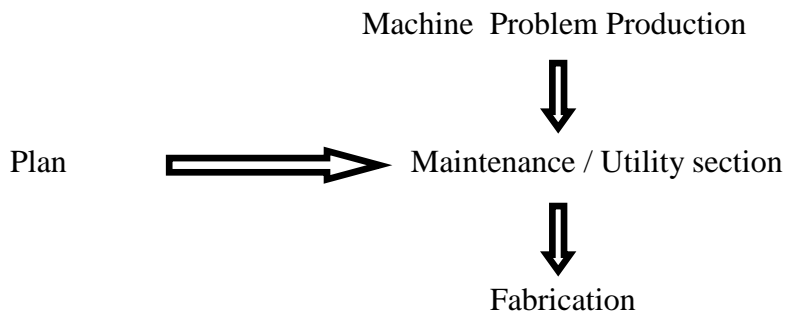
→It is also used for neutralizing the garments from alkaline condition

OPTICAL BRIGHTENER:

→It is used for improve the brightness of garments

3.12.UTILITY AND MAINTENANCE

3.12.1.INFORMATION FLOW :



3.12.2.OBJECTIVE OF MAINTENANCE SECTION:

- ❖ To keep the factory plants, equipment ,machine tools in an optimum working condition
- ❖ To ensure specified accuracy to products and time schedule of delivery to customers.
- ❖ To keep the downtime of machine of the minimum thus to have control over the production program.
- ❖ To keep the production cycle within the stipulated range.
- ❖ To modify the machine tools to meet the for production.

Two types of maintenance are performed in RUPASHI GROUP:

1. Schedule maintenance :It is time based maintenance and pre-planned to perform on machine and equipment . this plan usually made on monthly basis.
2. Breakdown maintenance: In this types of maintenance when the machine remain stop or some problem occurs in machine that time the maintenance is done.

3.12.3.MAINTENANCE TOOLS, EQUIPMENTS AND THEIR FUNCTION:

Name of tools

Function

Hammer	To give shape
Slide wrench	Tightening and opening bolt
Spanner	Tightening and opening bolt
Pliers	Cutting,holding,joining,gripping
Hacksaw blade	Cutting
Pipe wrench	Tightening,opening,gripping
Chisel	Shaping, cutting
Clamp	Shaping
Vice	Gripping

Name of equipments	Function
Lathe machine	To make various types of parts
Drill machine	Drilling
Cutting machine	Cutting
Shaping machine	Shaping
Grinding machine	Grinding
Welding machine	Welding
Bending machine	Bending

3.12.4.UTILITY

The following utility facilities are available in RUPASHI GROUP:

- ❖ Gas
- ❖ Electricity
- ❖ Water
- ❖ Steam
- ❖ Compress air

Generator :

No . of generator machine :06

- 1) Gas generator-04
- 2) Diesel generator-2

Specification of diesel generators:

Generator type	Diesel
Brand name	Cummins power generator
Model no	C1400D5
Country origin	India
Produce current	.750 MW

Specification of gas generator:

Generator type	Gas
Brand name	CAT
Model no	G-3516
Country origin	U.S.A
Produce current	1.0 MW

Boiler:

Only Fire tube boiler used in RUPASHI GROUP.

1. **Fire tube boiler** : (In fire tube boiler, fire is in tube, and water is in chamber).

Number of Boiler: 03

Specification of boiler:

Boiler type	Fire tube boiler
Company name	LONG SHING Machinerics
Country of origin	Taiwan
Maximum pressure	10kg/cm ²
Heating surface	240.2 M ²
Capacity	10 ton

Power	220V
No of phases	03

Water treatment plant:

The are two deep tubeweel by the two side of the treatment plant. There are also two submersible pumps in the deep tubeweel both is 200 ft deep. The submersible pump transfer raw water in the water tank by creates forces. The formation of de oxidation of the water by showering with the help of another two pumps in the water tanks.Iron content removes by the oxidation.

Standard water quality for dyeing :

Minimum standard	Permissible concentration
Color	Color less
Smell	No bad smell
Water hardness	<5°C
P ^H value	7-8 Neutral
Dissolved solid	<1mg/L
Inorganic salt	<500mg/L
Iron(Fe)	<0.1mg/L
Copper(Cu)	<0.005mg/L
Nitrate(NO ₃)	<5mg/L

Water hardness check :

The water hardness should be checked after every 6 hours. It should be checked by the hardness test kits.

If the hardness is ging to be 0.5 on the syringe scale, then have to do the regeneration process.

3.13.COMPLIANCE AND HUMAN RESOURCE

Ethical Trading Practice:

Ethical principles apply to all facilities of RUPASHI GROUP that produce readymade garments for exporting to foreign countries.

RUPASHI GROUP recognizes that there are legal and cultural environments in which factories operate. These ethical principles set forth the basic requirements of RUPASHI GROUP in order to do business with its customers abroad.

RUPASHI GROUP makes ceaseless effort to promote best practices and continuous improvement of ethical issues in all its manufacturing units. For easy access to the issues, RUPASHI GROUP posted contents in the Notice Boards of factories in both Bangla and English.

3.13.1.RUPASHI GROUP HAS BEEN FOLLOWING THIS FACTORS:

1. First aid boxes & Medicine

- Must equip with medicines at all times
- Must have list of medicines
- Must have pictures of first aid team members.

2. Fire Fighting Equipment:

- Fire Extinguisher must have the following:
 - Inspection card should be in place.
 - Picture of FFT should be posted.
 - Refill date should be update.
 - Pressure should be acceptable range.
 - Firefighting equipment should be in place as per the fire lenience.

3. Water Dispenser:

- Must be marked in Bengali
- Must be in usable condition

4. All electric panel board must ensure the following:

- Danger sign should be posted.
- Must provide under the panel board.
- Mark yellow or red color under the panel board.

5. All workers must use personal protective equipment:

E.g. needle guard, mask, eye guard, pulley guard etc.

6. QC table should have the proper lighting system.

7. Worker should not work in the floor without ID card.

8. Factory surrounding are should be clean

9. Receptionist must follow the visitor control policy and use the visitor/buyers/representative/suppliers/contractor cards.

10. All electric sockets should be attached and should not hang.

11. Worker training and motivation programme should be arranged and update.

12. Child care room should be equipped with all the required facilities.

13. Canteen facilities should be providing.

14. All workers should have the age verification certificate and kept in their personal file.

15. All finished goods cartoon should be kept in separate places. Cartoon must not store in the production floor.

16. Etc.

4.IMPACT OF INTERNSHIP

4.1.KNITTING SECTION:

- ❖ Introducing with different types of knitting machine
- ❖ Introducing with different types of knitted fabric
- ❖ Knitted fabric inspection system
- ❖ Machine operating system
- ❖ Introducing how to control fabric GSM
- ❖ Production calculation
- ❖ Introduce with work culture

4.2.DYEING SECTION:

- ❖ Batch preparation process
- ❖ Introducing with dyeing machine
- ❖ Machine operating system
- ❖ Dosing calculation
- ❖ Introducing with various types of chemicals & dyes
- ❖ Introducing with different types of dyeing process
- ❖ Introduce with work culture

4.3.FINISHING SECTION:

- ❖ Introducing with different types of finishing process
- ❖ Introducing with different types of finishing machine
- ❖ Machine operating system
- ❖ Introducing with different types of dyeing, printing & finishing faults
- ❖ Introducing how to control fabric GSM
- ❖ Introduce with work culture

4.4.PRINTING SECTION:

- ❖ Introducing with different types of printing process
- ❖ Introducing with different types of printing machine

4.5.GARMENTS SECTION:

- ❖ Introducing with different types of garments items
- ❖ Introducing with how to develop the sample
- ❖ Introducing with different types of sewing, cutting & spreading machine
- ❖ Sewing machine operating system
- ❖ Line arrangement
- ❖ Quality controlling system

5.CONCLUSION

Industrial attachment provides the learning scope to enhance the curiosity of our knowledge to entered into the practical life. RUPASHI GROUP is a well know factory in the textile field of Bangladesh. The administrative, management, chain of command all are the well organized. They are well equipped with all of the modern machineries and the working environment is excellent. The relation between top management to bottom level is so nice & devoted to satisfy the customer demand by their activities.

The completion of two month industrial training at RUPASHI GROUP gives us the inspiration on practical life that industries is one of the appropriate destines to implement the theoretical knowledge . From this industrial training for the details ideas about the industry environment, production process, management process , store and inventory process ,maintenance and utility etc.

RUPASHI GROUP is well equipped and the working environment is excellent .the relation between to management to bottom level is so nice. We are luckily to get the opportunity to having training in this group . The factories run by no. of efficient Textile Engineers and skills technical persons . They are very sincere, co-operative and helpful .

REFERENCE

- a) RUPASHI GROUP web site link.
- b) Different data collected from (knitting,dyeing, finishing, lab test,garments,washing and HR Depertments).