Faculty of engineering

Department of Textile Engineering

Report on

**Industrial attachment**

At

# H.R Textile Mills Ltd. (Pride Group)

4, karnapara, savar, Dhaka.

**Course Title:** Industrial Attachment    **Course Code:** TE-431

Submitted By:

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Department of Textile Engineering

Faculty of Engineering

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

**Advance in Wet Processing Technology**

**Duration:** From January17, 2018 to March17, 2018

# LETTER OF APPROVAL

15/04/2018

To

The Head

Department of Textile Engineering

Daffodil International University

102, shukrabad, mirpur road, Dhaka-1207

Subject: Approval for Industrial Attachment of B.Sc. in TE Program.

Dear Sir

I am writing to let you know that this industrial attachment report has been completed for final evaluation. The whole report is prepared based on proper investigation and understanding though critical analysis of empirical data with required belongings. The students were directly involved in their report based activities and the report becomes vital to spark off many valuable information for the readers.

Therefore, it will highly be appreciated if you kindly accept this project report and consider it for final evaluation.

Yours sincerely

Dr. S. M. Mahbub-Ul-Haque Majumder
Professor
Department of Textile Engineering

# DECLARATION

We hereby declare that the work presented in this paper is the outcome of the investigation performed by us. We also declare that all the materials of this paper are not copied from anywhere. We further declare that this paper or any part of this paper is not been submitted to anywhere. All the materials attached in this paper are full of practical and technical knowledge.

**Submitted by:**

_____          15/04/2018
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_____          15/04/2018
  Md. Yaseer Arafat Sajol                            Date

**Academic supervised by:**

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Professor
Department of Textile Engineering

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_____

Md. Imran Kamal Ahmed

HRD Department, H.R Textile Mills Ltd. (Pride Group).

# ACKNOWLEDGMENT

At first, gratefulness goes to Almighty Allah who gave us the strength and ability to complete the industrial training and this report. Now we would like to take this excellent opportunity to thank a lot of people who have assisted and inspired us in the completion of our training period.

**Prof. Dr. S. M. Mahbub-Ul-Haque Majumder**, Department of Textile Engineering, our supervisor to whom we are extremely indebted for his tremendous support and guidance throughout our training period. Being working with him we have not only earned valuable knowledge but also inspired by his innovativeness, which helped enrich our experience to a greater extent. His ideas and way of working was truly remarkable.

We would like to thank the management of the **H.R Textile Mills Ltd**. For giving us the opportunity to work on different sections and helping us in every possible way. Our deepest appreciation goes to **Mr. Amirul Islam** (dyeing shift manager), **Mr. Hannan** (dyeing manager), **Mr. Zayeed Iqbal** (knitting senior executive) of **H.R Textile Mills Ltd**. Without their permission and help our industrial training would be uncompleted. Special thanks to them for providing the required data and also for guiding in a profound way to complete our industrial attachment.

Finally, we must acknowledge with due respect the constant support and patients of our parents.

# ABSTRACT

This report is titled **"Industrial Attachment, H.R Textile Mills Ltd. (Pride Group)"** By achieving practical knowledge from the industrial attachment it is possible to apply the theoretical knowledge in the technical field. For any technical education, practical experience is almost equally necessary in association with the theoretical knowledge. The industrial attachment is the most effective process of achieving the practical experiences. It provides us sufficient practical knowledge about Production Management, Productivity, Evaluation, Work Study, Efficiency, Industrial Management, Production Planning & Controlling, Utilities and Maintenance of Machineries and their Operation Techniques etc. **H.R Textile Mills Ltd. (Pride Group)** is a modern textile industry based on knit garments production. Our approach was to know and work with all the parameters of each section and practice with technical experts. We have the opportunity to perform the industrial attachment with **H.R Textile Mills Ltd. (Pride Group)** during 2 Months long attachment, we studied the Man, Machine, Material and Planning, Grey Fabric Inspection, Finished Fabric Inspection, According to our studies in the whole chain of the factory we have prepared the following report and would like to present as my internship report. B.Sc. in Textile Engineering is the combination of theoretical knowledge and the practical experiences. The main objective of this training is to comprehend our theoretical knowledge along with the practical knowledge. It also enabled us to orient ourselves with the practical environment which will be our place of future work.

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# Chapter – 1

# Executive summery

# 1. Executive summery

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.

Textile and garments sector is the biggest and fastest growing sector in Bangladesh. Among this sector, knit garment is growing very rapidly due to smaller investment requirement, greater backward linkage facility and higher profit than woven garments. That's why export of knit garments is increasing steadily for last few years and up to now.

It is our pleasure that we had an opportunity to complete our two month internship at **H.R Textile Mills Ltd. (Pride Group)**, which is one of the most modern industries of the country.

**H.R Textile Mills Ltd. (Pride Group)** is one of the major knitting and garments manufacturing organization in Bangladesh. This organization increasingly reducing its rejection and rework rate in-process and final garments in order to ensure product quality and delivery time as per buyer requirement and increase profitability. **H.R. Textile Mills Ltd. (Pride Group)** will ensure sufficient training and suitable work to increase productivity and skills for the employee.

Textile education can't be completed without industrial training. Because this industrial training minimizes the gap between theoretical and practical knowledge and make accustomed to industrial environment.

In this report we are trying to cover a short profile of **H.R Textile Mills Ltd. (Pride Group)** and major customers of this industry and their different activities.

# Chapter – 2

# Information of the factory

## 2.1 Introduction

Practical knowledge is very much essential for the education of textile engineering and technology. Practical knowledge makes us capable and perfect to apply theoretical knowledge in practical life. The textile sector has the capability to offer a complete product range for the export textile markets. The goal of the textile sector is to become the preferred partner for sourcing high quality fabrics and clothing from Bangladesh. With highly advanced technology and an emphasis on developing local human resources.

That is why B.Sc. in Textile technology course is extruded over four years followed by two months industrial training in mills. It is attached to my study curriculum to achieve adequate practical knowledge and develop adoption power with industrial environment.

We prepared this attachment in H.R Textile Mills Ltd. (Pride Group), which is a hundred percent export oriented knit composite industry. It is fully approved by several multinational inspection firms.

## 2.2 History of the factory

Pride group is a vertical textile group engaged in the manufacture and export is knitwear products to the European Union, the USA and Canada. The group is also engaged in production and marketing of saris, kids wear, ladies' wear, foam furnishing and other textile products through a chain of 66 retail outlets spread all over Bangladesh. As of date, Pride group consists of H.R Textile Mills Ltd, Fashion Knit Garments Ltd, Dacca Textiles Ltd, Pride Ltd, Urban Truth and MODA.

**Early years**

Pride group began its journey in 1958, when founder Halimur Rahman first established Dacca Textiles, laid the foundation to what would eventually become Pride Ltd. He came to the realization that much of the saris in popular demand at the time, where imported from neighboring countries, and that locally hand-crafted materials were seldom used or appreciated. At the time of Dacca Textiles' inception, Rahman was employed in EPSCIC, and it is from this that he arrived at the idea of establishing a garment factory that would supply locally made saris for the women of Bangladesh.

Pride group was awarded "Brand excellence in retail sector" by the world brand congress in Singapore on 31 july' 2014, in recognition for their leading brand, Pride Ltd.

**H.R Textile Mills Ltd.**

H.R Textile Mills Ltd is a vertical public limited company, engaged in manufacture of knitwear products. H.R Textile Mills is a Lycra assured factory. Zara, Bershka, New Look, Stradivarius, and El Corte Ingles are some of their clients.

Fashion Knit Garments Ltd is engaged in manufacturing knitwear products, consisting of ladies tops, sports and active wear, children outerwear, and mens' innerwear.

**Pride Ltd**

Pride Ltd, in its present form, started with the setting up of retail outlet at TMC bhaban in 1991. Its professional team now manage 70 outlets that successfully cater to the needs of a client base spread all over Bangladesh. Pride Ltd was previously known as Pride Textiles.

**Product range**

Urban Truth deals in knitwear, that is manufactured entirely by H.R Textile Mills Ltd. and Fashion Knit Garments Ltd. they also provide woven options, and shoe and jewelry line.

They have a total employee of around 2900 people. The current annual revenue is aprox USD 18 million which are being targeting at around USD 24 million after the necessary changes in strategies and structured by 2008

## 2.3 Founder and Directors

| | |
|---|---|
| Mr. Mohammad Abdul Moyeed | Chairman and managing director |
| Dr. Mr. Mohammad Abdul Moyeen | Director |
| Mr. Mohammad Abdul Momen | Director |
| Professor Dr. A. H. Habibur Rahman | Independent Director |
| Mrs. Ruhey Rawa | Director |
| Ms. Sumbal Azwad Momen | Director |
| Ms. Sama Kainat Moyeen | Director |

## 2.4 General Information about Factory

Name: H.R Textile Mills Ltd. (Pride Group)

Type: 100% export oriented private industry

Year of establishment: 1990

Total man power: over 3000

Address: 4, karnapara, savar, Dhaka, Bangladesh

Production capacity:

- Kitting: 8 tons/day (average)
- Dyeing: 7.5 tons/day (average)
- Sewing: 500000 pcs/day (average)

Main production: basic T-Shirt, tank top, long sleeve, T-Shirt, polo shirt, shorts, ladies item, kids knitwear and all kinds of knit garments and fabrics.

Tel: 880-2-9893747, 880-2-8828911

Fax: 880-2-7643697

Email: info@hrtextile.com.bd

Website: http://www.pride-grp.com

## 2.5 Factory layout

## 2.6 Organogram



2.7

**H.R Tex. Factory Organ gram TextileTEXTIL MILLS**

Managing director

Director | General manager | Merchandiser Manager

Finance | HDR | Factory Manager | Senior Merchandiser

Sewing | Cutting | Finishing | Quality | Junior Merchandiser

PM | Manager | Manager | Manager | Asst. Merchandiser

APM | Asst. manager | Asst. manager | Asst. manager | Sample development Incharge

Line chef | Staff | Staff | Staff | Pattern master

Supervisor | Worker | Worker | Worker | Sample man or worker

Worker | Helper | Helper | Helper

Helper

## 2.7 Main area of export

- France
- Spain
- Germany
- England
- Italy
- Some other countries of Europe as well

## 2.8 Major buyer

- ETAM PAP MAG
- EL CORTE
- BERSHKA
- TERRA NOVA
- ZARA

## 2.9 Certification

- ISO 9002
- DOTS by Cu (Control Union)

## 2.10 Mission

- Lead through innovation and intelligence.
- Priorities customer satisfaction.
- Global quality.
- Competitive pricing.
- Optimal resource utility at all times.
- Optimal use of information and technology.
- Continuous development and growth of human capital.
- Every action of every person to be sincere and profit oriented.
- Create environment that drives intelligence amongst all involve.

# Chapter – 3

# Description of the Attachment

## 3.1 Knitting Section:

Knitting is a method of converting yarn into fabric by a series of intermeshing/interlocking loops, which are formed from a single yarn or from many yarns with the help of needles, is known as knitting. As each row progress a new loop is formed through an existing loop. The active stitches are held on a needle until another loop can be passed through them. This process eventually results in a final product.



Fig: Knitting m/c

## 3.1.1 Layout of knitting floor:



Fig: Layout of knitting floor

## 3.1.2 Organogram:

```
knitting          Supervisor ──── Writer
Manager               │              │
   │                  │              │
Assistant         Flat Knitting   Operator
Knitting             Master          │
Manager               │              │
   │                  │              │
Floor ──── QC In Charge           Cleaner
In-Charge
```
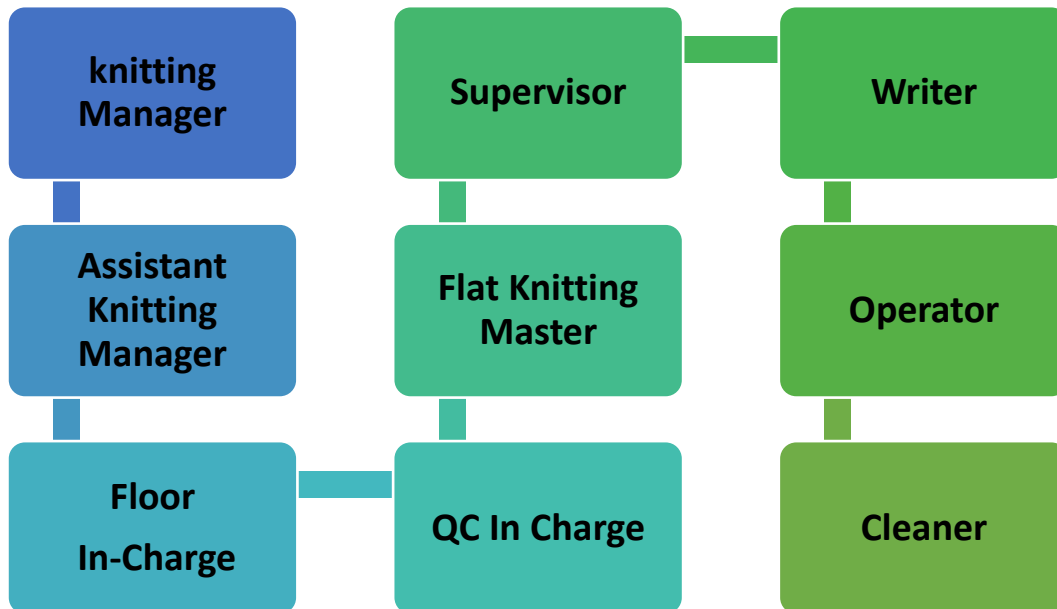
## 3.1.3 Flow Chart of Knitting Section:

Yarn in cone form

⇩

Feeding the cone in the creel

⇩

Feeding the yarn to feeder through positive feeding arrangement and tension device

⇩

Knitting

⇩

Withdraw the fabric roll and weightening

⇩

Inspection

⇩

Numbering
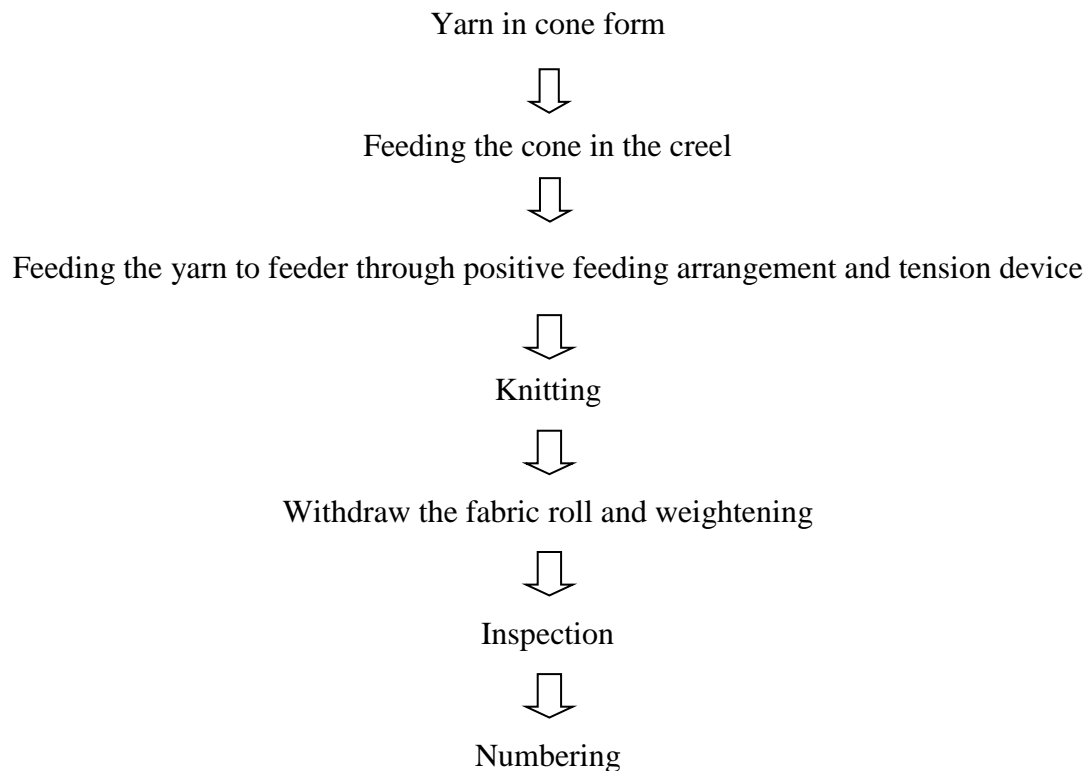
## 3.1.4 Raw materials of knitting section and their sources:

Yarn is used in knitting section as raw material. Different types of yarns are used in this section. Such as:

1. 100% cotton (compact)

2. Polyester65% & Cotton35%

3. Spandex 20D

4. 100% viscose

5. 100% mélange yarn

6. 100% cotton carded spun yarn

7. 100% cotton slub yarn

8. Blended (60+40) CVC

9. Grey mélange ring yarn

10.50% modal +50% cotton

11. Metallic yarn

12. Rayon 100% vortex.


## 3.1.5 Sources of yarn for knitting:

1. Shirin spinning mills ltd.

2. Arif knit spin ltd.

3. CRC textile mills ltd.

4. Sportking industries.

5. Thermax group.

6. NRG hometex ltd.

7. Maksons spinning mills ltd.

8. Square fashion yarns ltd.

9. Ha-meem spinning mills ltd.

10. Sritex.

11. Square yarns ltd.

12. NZ textile ltd.

13. Multazim spinning mills lts.

14. Matam spinning mills ltd.

15. Anlima yarn dyeing ltd.

16. AA yarn mills ltd.

17. Creora.

18. A.S.F fiber knit limited.

19. T.k chemical corp.

20. Hanif spinning mills ltd.

21. Akij textile mills ltd.

22. Utah spinning mills ltd.

### 3.1.6 Product mix in knitting section:

- 100% cotton.
- 100% viscose.
- Grey mélange.
- CVC.
- Lycra.
- Polyester.
- Cotton + Modal (60%+40%)

**Polyester yarn:** India, Indonesia, Korea

**Lycra:** Singapore, Indonesia, Korea, Japan

**Sources of mélange:** Prime group, Thermax group.

### 3.1.7 Production calculation:

1. Production/shift in kg 100% efficiency:

$$\frac{RPM * No.\ of\ needle * No.\ of\ feeder * stitch\ length}{3527.80 * yarn\ count}$$

2. Production/shift in meter:

$$\frac{Course/min}{Course/cm}$$

### 3.1.8 Machine specification:

**Brand: FUKAHAMA MACHINERY CO. LTD**

Dia: 23inch

Gauge: 24

Feeder: 69

Needle: 1734

Origin: Taiwan

Model: SH- 2BFA



Fig: Fukahama m/c

**Brand: MAYER &CIE**

Dia: 30inch

Gauge: 24

Needle: 2640

Feeder: 96

Origin: Germany

Model: Relaint 3.2 II

Fig: Mayer & CIE

**Brand: Jiunn Long M/C Co. Ltd**

Dia: 38 inch

Gauge: 24G

Needle: 2880T

Feeder: 114f

Origin: Taiwan



Fig: Jiunn long m/c

**Brand: Sie-Dim Machienary Co. Ltd**

Dia: 32 inch

Gauge: 20

Feeder: 96

Needle: 2010

Model: TS-F2

Origin: Taiwan



Fig: Shie- Dim m/c

**Brand: Paolo Orizio Machienary Ltd.**

Dia: 30 inch

Gauge: 18

Needle: 1680

Feeder: 60

Origin: Italy

Model: CMOAN



Fig: Paolo Orizio

### 3.1.9 Machine Description:

| Machine Type | Brand | Origin | Model | Feeder | Dia | Gauge | No. of needles | Total number of m/c |
|---|---|---|---|---|---|---|---|---|
| Single Jersey | Fukahama | Taiwan | SH-2XFA SH-2BFA | 126,120,69, 75,102, 108, 114 | 42,23,25,40 34,36,38 | 24,25 | 2864,3014,1763, 2714,1884,2562, 3166 | **07** |
| | Mayer & CIE | Germany | Relanit 3.2II | 96 | 30 | 24 | 2640 | **09** |
| | Jiunn long m/c | Taiwan | JLS-2 JLS-C | 114F, 102, 108 | 38,34,16 | 24 | 2800,2544,2712 | **08** |
| | Shie-dim m/c | Taiwan | TS-F2 | 90,96 | 30,32 | 20 | 1884,2010 | **04** |
| Double Jersey | Paolo orizio | Italy | COMAN | 60,72,68 | 30,36,34 | 18,16 | 1680,1500,1716, 1920,1740,3616 | **14** |
| Single Jersey | Donghoi m/c | China | DH-53F | 90 | 30 | 24 | 2260 | **01** |
| Flatbed knitting m/c | Shima seiki mfg. ltd | Japan | SFF152 | 4 | | 14 | 840+840=1680 | **02** |

### 3.1.10 Different parts of circular knitting machine and their functions:

**Creel:** Creel is a part of knitting machine. Each yarn package is store there and always ready to feed the machine.



Fig: Creel

**VDQ pulley:** It is a very important part of the machine. It controls the quality if the product. Altering the position of the tension pulley changes the G.S.M of the fabric. If pulley move towards the positive directive then G.S.M is decrease and in reverse direction G.S.M will increase.



Fig: VDQ pulley

**Pulley belt:** It controls the rotation of the wheel.



Fig: Pulley belt

**Yarn guide:** It helps the yarn to feed the feeder.

**Positive feeder:** It gives positive feed to the machine.



Fig: Positive feeder

**Auto stopper:** It is an important part of the machine. It stops the machine instantly when a yarn is break.



Fig: Auto stopper

**Needle:** It is a principal element of knitting machine. It helps the yarn to create a loop and by this way fabric is produced.  Prior to yarn feeding to needle is raised to clear the old loop from the hook and receive the new loop above it on needle stem. The new loop is enclosed in the needle hook as the needle starts to descend.
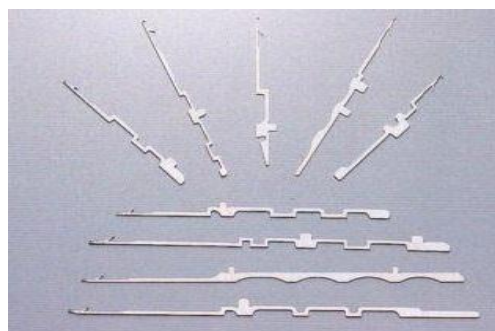


Fig: Needle

**Sinker:** It is most important element of the machine. It helps to loop forming and knocking over and holding down the loop.



Fig: Sinker

**Cam box:** Where the cam are set horizontally.



Fig: Cam box

**Cam:** Cam is device which converts the rotary motion into reciprocating motion to the needles and other elements.



Fig: Cam

**Lycra attachment device:** Lycra is attached here and feed to the machine.



Fig: Lycra attachment device

**Cylinder:** Needle track are situated here.



Fig: Cylinder

**Air gun nozzle:** To feed the yarn, sometimes it is used for cleaning purpose.



Fig: Air gun nozzle

## 3.1.11 Process path of circular knitting machine:

```
┌──────────────┐
│    Creel     │
└──────┬───────┘
       ↓
┌──────────────┐
│     Cone     │
└──────┬───────┘
       ↓
┌──────────────┐
│  Yarn guide  │
└──────┬───────┘
       ↓
┌──────────────────────┐
│  Auto tension device │
└──────────┬───────────┘
           ↓
┌──────────────────┐
│   Auto stopper   │
└────────┬─────────┘
         ↓
┌──────────────────┐
│   Yarn guide     │
└────────┬─────────┘
         ↓
┌──────────────┐
│    Wheel     │
└──────┬───────┘
       ↓
┌──────────────┐
│  Yarn guide  │
└──────┬───────┘
       ↓
┌──────────────┐
│ Auto stopper │
└──────┬───────┘
       ↓
┌──────────────┐
│    Guide     │
└──────┬───────┘
       ↓
┌──────────────┐
│     Hole     │
└──────┬───────┘
       ↓
┌──────────────┐
│    Feeder    │
└──────┬───────┘
       ↓
┌──────────────┐
│    Needle    │
└──────┬───────┘
       ↓
┌──────────────┐
│  Feed roller │
└──────┬───────┘
       ↓
┌──────────────┐
│ Takeup roller│
└──────────────┘
```
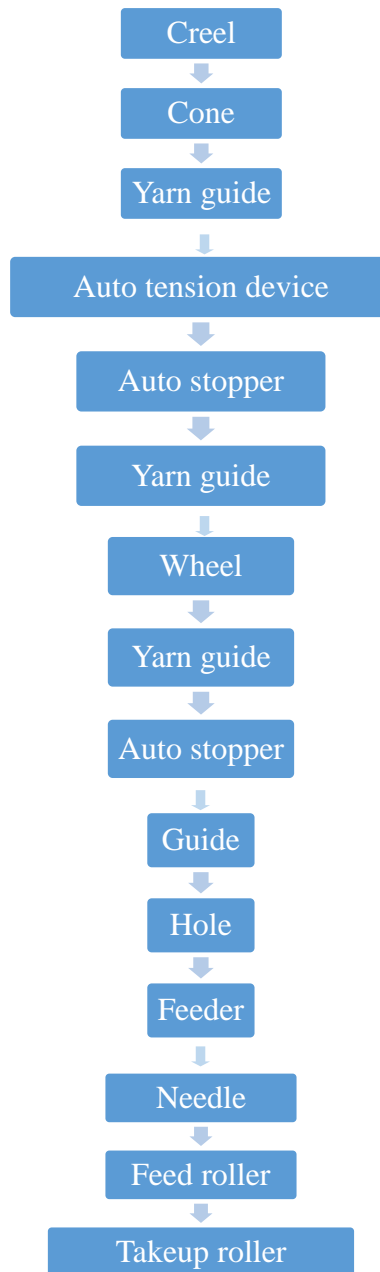
## 3.1.12 Production process description:

- ➢ Authority takes order from buyer.
- ➢ Merchandising department estimates total amount of fabric production.
- ➢ Knitting manager get production order from the merchandising department.
- ➢ Knitting manager fixes up stitch length and GSM with merchandising department.
- ➢ Operator setup the machine according to the instruction.
- ➢ Fabric is produced according to demand.
- ➢ Supervisor supervises the processes.
- ➢ Fabric is rolled and need to take weight after processing.
- ➢ Fault is checked on inspection table.
- ➢ Report the fault according to grading.



Fig: Fabric booking sheet



Fig: Knitting machine program

## 3.1.13 Fabric inspection system:



After finishing the knitting procedure fabric needs to check for any kind of fault according to 4 point grading system. Operator marks the fault with a marker and note down to the record keeping sheet.

| FOUR POINT GRADING SYSTEM | |
|---|---|
| Size of defects | Penalty |
| 3 inches or less | 1 point |
| Over three inch but not 6 inch | 2 point |
| Over 6 inch but not 9 inch | 3 point |
| Over 9 inch | 4 point |

| Acceptance Calculation | |
|---|---|
| Up to 20 points | A Grade |
| 21- 30 points | B Grade |
| 31- 40 points | C Grade |
| Above 40 | Rejected |

### 3.1.14 Faults of knitting:

1. Hole knitting.

2. Needle mark.

3. Sinker mark.

4. Star mark.

5. Drop stitches.

6. Oil stain.

7. Rust stain.

8. Pin hole.

9. Fly.

10. Yarn contamination.

### 3.1.15 Quality control:

Quality control or QC for short term is a process by which entities review the quality of all factors involved in production. Control includes product inspection, where every product is examined visually. If the process is not accurate outcome products may reject from the customers or buyers.

### 3.1.16 Objects of quality control:

- Process control
- Process development
- Product development
- Research

## 3.2 Dyeing section

Coloration is the main stage of chemical application for attractiveness or decoration of textile end product. But to get the best result of coloration some preparatory steps are necessary for grey textiles. Dyeing is the process of adding color to textile products like fibers, yarns, fabrics.

Wet process steps for a particular fabric are selected according to the specific end use. These are mainly different types of chemical reactions. Wet processing stages are primarily classified under three heading: Pre-treatment, Dyeing/ Printing, Finishing.

### 3.2.1 Batch preparation

Batching is the process to prepare the fabrics which will be dyed and processed for a particular order.

### 3.2.2 Batch process

Grey fabric inspection

⬇

Batching

⬇

Storing for dyeing

### 3.2.3 Objectives of batch preparation

1. Receive the grey fabric roll from knitting section or from the supplier.
2. Prepare the batch for dyeing according to
   a. Machine selection.
   b. Types of fabric.
   c. Order sheet.
   d. Dyeing recipe.

3. To minimize the washing time and machine stoppage.
4. Can use the maximum capacity for the dyeing.

### 3.2.4 Dyeing organogram
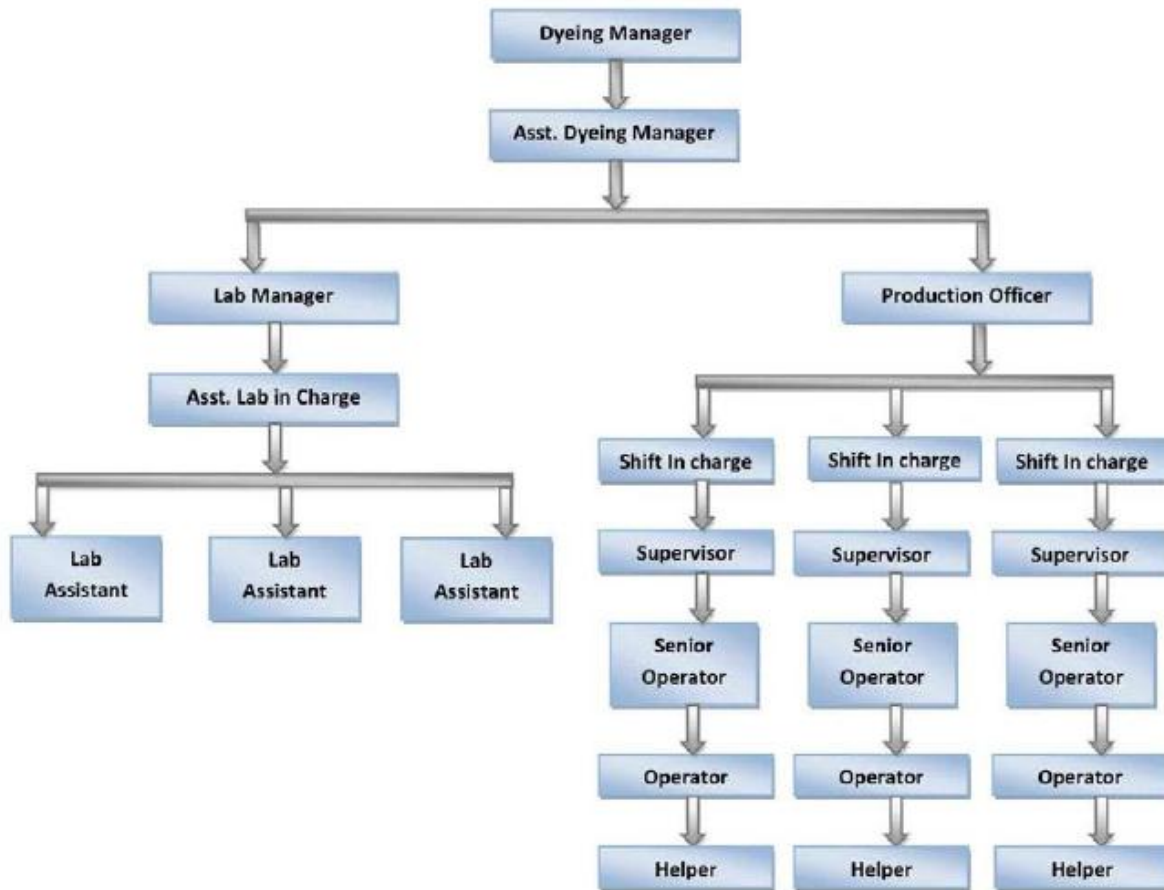


Fig: Dyeing organogram

### 3.2.5 Fabrics dyed in dyeing section

- ✓ Single jersey
- ✓ Single jersey with lycra
- ✓ Polo pique
- ✓ Back pique
- ✓ Fleece
- ✓ Fleece with lycra
- ✓ Rib
- ✓ Rib with lycra
- ✓ 1x2 rib
- ✓ 2x2 rib
- ✓ Single lacoste
- ✓ Double lacoste
- ✓ Different types of collar

## 3.2.6 Percentage of soda and dyes in dyeing section

| Dyeing section | Lab only | | | Bulk production | | |
|---|---|---|---|---|---|---|
| | Salt gm/l | Soda gm/l | Caustic gm/l | Salt gm/l | Soda gm/l | Caustic gm/l |
| Below 0.2 | 1.6 | 2.2 | - | 20 | 7 | - |
| 0.21-0.5 | 2.4 | 3.2 | - | 30 | 10 | - |
| 0.51-1 | - | 4.8 | - | 40 | 15 | - |
| 1.01-2 | 4 | 4.8 | - | 50 | 15 | - |
| 1.01-2 | 4 | 1.6 | 1 | 50 | 15 | 5 |
| 2.01-3 | 4.8 | 6.4 | - | 60 | 20 | - |
| 2.01-3 | 4.8 | 1.6 | 1.4 | 60 | 5 | 0.7 |
| 3.01-4 | 5.6 | 6.4 | - | 70 | 20 | - |
| 3.01-4 | 5.6 | 1.6 | 1.4 | 70 | 5 | 0.7 |
| 4.01-6 | 6.4 | 2.2 | 2 | 80 | 7 | 2 |
| 6.01-8 | 6.4 | 2.2 | 2.4 | 80 | 7 | 1.2 |

## 3.2.7 Sequence of dyeing operation

Grey fabric receive from knitting floor or supplier

⬇

Batching

⬇

Loading to the m/c

⬇

Production program selection

⬇

Pre-treatment

⬇

Select recipe for dyeing

⬇

Conformation of recipe

⬇

Dyeing

⬇

Unload

⬇

After-treatment
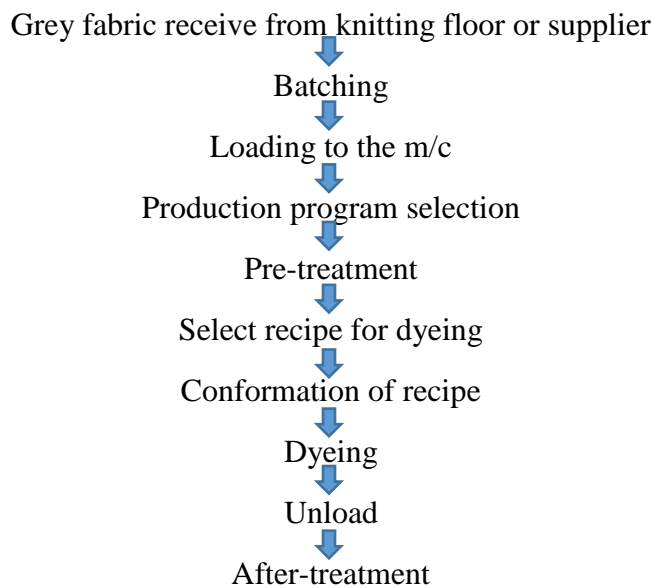
### 3.2.8 Production parameters

- During reactive dyeing $p^H$ 10.5-11.5
- During disperse dyeing $p^H$ 4.5-6.0
- During $H_2O_2$ bleaching $p^H$ 9.2-12

## Temperature

1. For cotton scouring: (90-95) $^0C$
2. For cotton cold wash: (30-40) $^oC$
3. For cotton hot wash: (70-80) $^oC$
4. For cotton acid wash: (60-70) $^oC$
5. For cotton dyeing: (80-90) $^oC$ hot brand
   $\qquad\qquad\qquad\qquad$ 60 $^oC$ cold brand
6. Polyester dyeing: (100-300) $^oC$

## Time

1. For scouring 60-90 min
2. For disperse dyeing 60-90 min

## M:L

- For reactive dyeing M:L = 1:6 to 1:10

## 3.2.9 Machine capacity

| Floor | Type | Name | Origin | Model | Capacity | Nozzle |
|-------|------|------|--------|-------|----------|--------|
| Floor 01 | Bulk production | Sclavos 01 | Greece | Sedomat 5500 | 720kg | 04 |
| | | Sclavos 02 | Greece | Sedomat 5500 | 540kg | 03 |
| | | Fong's 01 | China | 2800-FC28 | 1000kg | 04 |
| | | Fong's 02 | China | 2800-FC28 | 750kg | 03 |
| | | Fong's 03 | China | 2800-FC28 | 500kg | 02 |
| | | Fong's 04 | China | 2800-FC28 | 400kg | 02 |
| | | Fong's 05 | China | 2800-FC28 | 400kg | 02 |
| | | Colorsoft 01 | India | | 250kg | 01 |
| | | Fong's 06 | China | FC28 | 750kg | 03 |
| | | Fong's 07 | China | FC28 | 750kg | 03 |
| | | Fong's 08 | China | FC28 | 750kg | 03 |
| | | Colorsoft 02 | India | 2500t | 200kg | 01 |
| | | Colorsoft 03 | India | 2500t | 150kg | 01 |
| | | Colorsoft 12 | India | 2500t | 100kg | 01 |
| | | Colorsoft 09 | India | 2500t | 400kg | 01 |
| | | Colorsoft 05 | India | 2500t | 400kg | 04 |
| | | Colorsoft 06 | India | 2500t | 400kg | 04 |
| | | Colorsoft 07 | India | 2500t | 500kg | 04 |
| | | Colorsoft 08 | India | 2500t | 500kg | 04 |
| | | Colorsoft 10 | India | 2500t | 500kg | 04 |

| Floor | | Name | Country | Type | Capacity | Quantity |
|---|---|---|---|---|---|---|
| | | Colorsoft 11 | India | 2500t | 350kg | 02 |
| Floor 02 | Bulk production | Colorsoft 01 | India | 2500t | 10kg | 01 |
| | | Colorsoft 02 | India | 2500t | 10kg | 01 |
| | | Colorsoft 03 | India | 2500t | 10kg | 01 |
| | | Colorsoft 04 | India | 2500t | 10kg | 01 |
| | | Colorsoft 05 | India | 2500t | 10kg | 01 |
| | | Colorsoft 06 | India | 2500t | 10kg | 01 |
| | | Colorsoft 07 | India | 2500t | 10kg | 01 |
| | | Colorsoft 08 | India | 2500t | 10kg | 01 |
| | | Colorsoft 09 | India | 2500t | 10kg | 01 |
| | | Colorsoft 12 | India | 2500t | 10kg | 02 |
| Floor 03 | Sample dyeing | Fong's 11 | China | FC-28 | 60kg | 01 |
| | | Colorsoft 10 | India | 2500 | 50kg | 01 |

## 3.2.10 Dyeing parameters

| 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 |

## 3.2.11 Shade check & inspection

Dyeing supervisors and the respective managers check the shade of the bulk productions. If the production meet the required parameters then it turn into finishing, otherwise stripping or destroy wash is done though the instruction.

## 3.2.12 White Process:

FILL

HEATING TO 50$^0$C, INJECT LIQUID AUXILIARIES

FABRIC LOAD

TRANSFER CMS-100

HEATING TO 55$^0$C

CAUSTIC DOSING, 5 MIN, LINEAR

RUN 5 MIN

HEATING TO 70$^0$C

H$_2$O$_2$ DOSING, 5 MIN, LINEAR

RUN 5 MIN

BRIGHTENER DOSING 30 MIN

HEATING TO 95$^0$C, TG=3$^0$C

RUN 40—60 MIN (AS REQUIRED FOR SHADE MATCHING)

COOL TO 80$^0$C, TG=3$^0$C

AQUACHRON 10 MIN

DRAIN & FILL

HEATING TO 70$^0$C

RUN 10 MIN

DRAIN & FILL

HEATING TO 50$^0$C, TRANSFER CORE NEUTRALIZER (ISOPON ACR-I)

RUN 10 MIN

pH SET POINT

TRANSFER CATALASE ENZYME

RUN 60 MIN

HEATING TO 75$^0$C

RUN 5 MIN

DRAIN & FILL

AQUACHRON 5 MIN

UNLOAD & DRAIN.

### 3.2.13 Dark Process:

FILL

$P^H$ SET POINT

RAISING TEMPERATURE TO $60^0$C, TRANSFER LEVELING & AUXILIARIES

RUN 6 MIN

DYES DOSING, 20 MIN, LINEAR

LEVELING AGENT: LDR=1 g/L
SEQ. AGENT: 48/98= 0.5 g/L

RUN 6 MIN

TRANSFER SALT

RUN 20 MIN FOR AVERAGE COLOR / 30 MIN FOR DARK COLOR

SODA DOSING, 30 MIN, LINEAR

MATCH SHADE (RUN 40—60 MIN)

AQUACHRON 10 MIN

DRAIN.

## 3.3 Finishing:

Textile finishing, in a restricted sense, is the term used for a series of processes to which all bleached, dyed, printed and certain grey fabrics are subjected before they are put to market. It's one of the most important operations in knit processing.

## 3.3.1 Objects of finishing:

1. Improving the appearance, luster, whiteness etc.
2. Improving the feel.
3. Wearing qualities- non-soiling, antistatic, ant shrink, comfort etc.
4. Special properties required for particular uses such as water proofing, flame proofing etc.
5. Covering the faults in the original cloth.
6. Increasing the weight of the cloth.

## 3.3.2 Effects of finishing:

1. Easy care.
2. Crease recovery.
3. Dimensional stability.
4. Good abrasion resistance.
5. Improved tear strength.
6. Good sew ability.
7. Soft or stiff handle.
8. Shine or luster.

Knit fabrics require finishing processes after dyeing. During dyeing all knit fabrics are dyed in tubular form. According to buyers requirement dyed fabrics are finished in either Tubular or Open width form.

Depending on which finishing sections are separated into two section Open & Tube section.

### 3.3.3 Open-finish:

<div align="center">

Hydro extractor
⬇
Slitting & dewatering
⬇
Stenter
⬇
Compactor
⬇
Q.C
⬇
Delivery

</div>

### 3.3.4 Tubular-finish:

<div align="center">

Hydro extractor
⬇
Dryer
⬇
Turning machine
⬇
Steam setting machine
⬇
Tube compactor

</div>
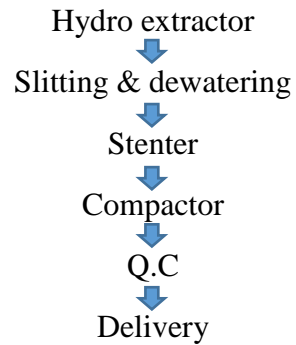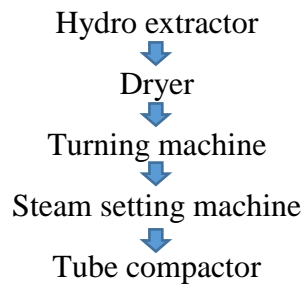
### 3.3.5  Slitting machine:

Manufacturer: Bianco, Italy

Slitting machine is used to dewater and to give a form for further finishing processes.

- ✓ Slit- cut the tubular fabric through the needle mark.
- ✓ Remove excess water.
- ✓ Prepare the fabric for next operation.



Fig: Slitting m/c

### 3.3.6  Stenter :

Manufacturer: Brukner, Germany

- ✓ To dry the fabric.
- ✓ Heat set the synthetic material.
- ✓ Controlling the width of the fabric.
- ✓ Controlling the GSM of the fabric.
- ✓ Bowing controlling of stripe fabric.
- ✓ Twisting control.
- ✓ Fabric hand feels modification like- softening or hardening.
- ✓ Shade control.
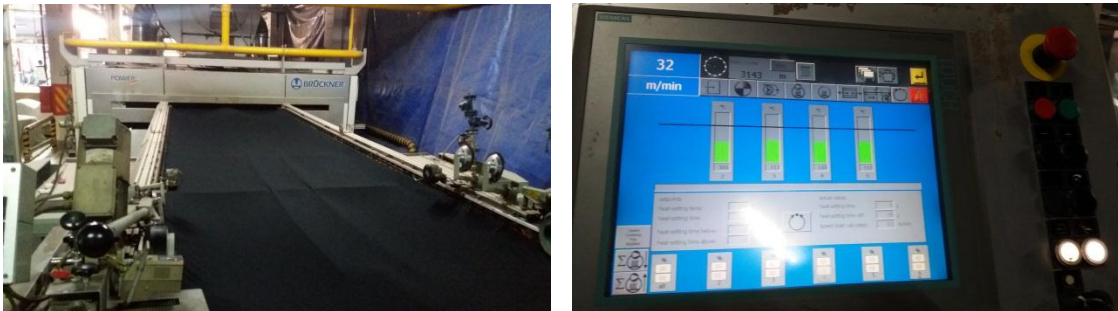


Fig: Stenter m/c

### 3.3.7 Compactor:

Manufacturer:  Lafer, Italy.

## Objectives:

1. To compact the fabric.
2. To control the shrinkage.
3. To maintain proper width and G.S.M

**Heating system:** Steam

## Main parts of the machine:

1. Heating chamber
2. Blower
3. Synthetic blanket as conveyor
4. Exhaust fan
5. Unpinning cylinder

6. Belt cylinder
7. Uncurling device
8. Sensor
9. Brush roller

## Additional device:
1. Selvedge cutting
2. Selvedge safety
3. Pinning safety
4. Selvedge unrolling


Fig: Compactor

## 3.3.8 Dryer:

Manufacturer: Albrecht, Brazil

## Function:

1. To dry the wet fabric.
2. Control the shade & GSM slightly.

## Main parts:

1. Feed unit, contain conveyer belt & number of rollers.
2. Drying section.
3. Steam is used for heating.
4. Blower, to spread the steam.
5. Exhaust air ventilator.

## Technical parameters:

1. Temperature: For colored fabric: $140,150,130\,^{o}$C
   For white fabric: $120\,^{o}$C
2. Speed : 8-80 m/min

3. Nozzle distance: 35-55 mm


Fig: Dryer

## 3.4.1 Organogram of Garments section:

Manager
⬇
Assistant manager
⬇
Sr. Executive
⬇
Executive
⬇
Officer
⬇
Supervisor
⬇
Sr. marker man
⬇
Marker man
⬇
Sample man
⬇
Wheel man
⬇
Cutting man
⬇
Cutting assistant
⬇
Iron man
⬇
Folder man
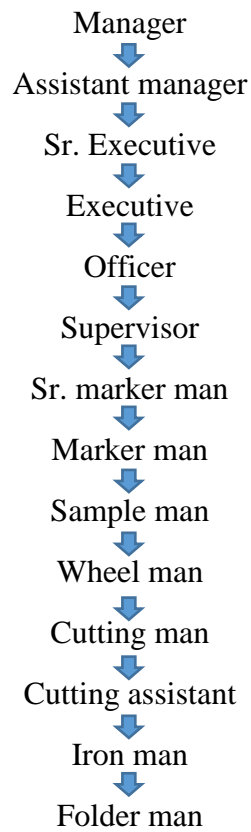
In this hierarchy company recruit their manpower based on need. Each position can have several workers by maintaining shift.

## 3.4.2 Garments manufacturing process:

Garments manufacturing sequence is given below.

Design/Sketch
⬇
Pattern design
⬇
Sample making
⬇
Production pattern
⬇
Grading
⬇
Marker making
⬇
Spreading
⬇
Cutting
⬇
Sorting/ Bundling
⬇
Sewing
⬇
Inspection
⬇
Pressing/ Finishing
⬇
Final inspection
⬇
Packing
⬇
Store
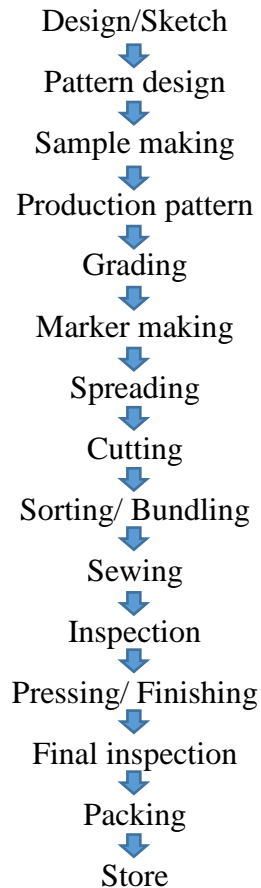
## 3.5.1 Pattern making:

Patterns are hard paper which is made by following each and individual components with all specification.

## 3.5.2 Types of pattern:

Generally pattern can be divided into two types.

- ✓ Production Pattern
- ✓ Working Pattern

Production pattern: The pattern which is used for bulk production that's called production pattern.

Working pattern: The pattern which is used to make sample garment that is called master pattern or working pattern.

## 3.5.3 Marker making:

In this company marker is drawn on a large paper though the help of AutoCAD.
Then with the help of this garments are cut.

- Marker making procedure-
  - First, sample pattern is drawn.
  - Then with the help of AutoCAD production pattern is made by large thin paper.
  - All the size number, batch number, order number is printed there.



Fig: Marker Spreading

## 3.5.4 Objectives of marker:

- To save times.
- To reduce cost.
- To minimize fabric wastage.
- To get similarities.

## 3.5.5 Cutting section:

Here, with the help of marker fabrics are on the spreading table.

Number plies depend on:

- Thickness of fabric.

- Volume of fabric.
- Cutting machine capacity.
- Types of fabric.



Fig: Fabric Cutting

## 3.5.6 Organogram of cutting section:

Manager
⬇
Assistant manager
⬇
Staff
⬇
Worker
⬇
Helper
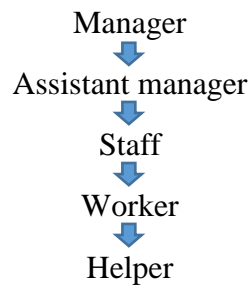
## 3.5.7 Fabric spreading:

Fabric spreading can be divided into two types:

1. Flat spreading
2. Stepped spreading

Fig: Fabric Spreading

### 3.5.8 Ideal lay height of cutting:

| Heavy weight | 4-5 inch. |
|---|---|
| Medium weight | 3-4 inch. |
| Light weight | 2.5-3 inch. |

### 3.5.9 Cutting tools:

1. Scissors
2. Straight knife
3. Band knife
4. Round knife
5. Die cutter
6. Automated knife cutter
7. Laser cutter
8. Drill machine

Fig: Cutting Machine

### 3.5.10 Cutting defects:

1. Numbering mistake
2. Incorrect cutting
3. Cut mark (up-down)

### 3.6 Printing Section:

Organogram of printing section:

Printing In-charge

| Screen man | Color master | Supervisor | Printing sample In-charge |

Helper

Printer

Dryer man        Helper
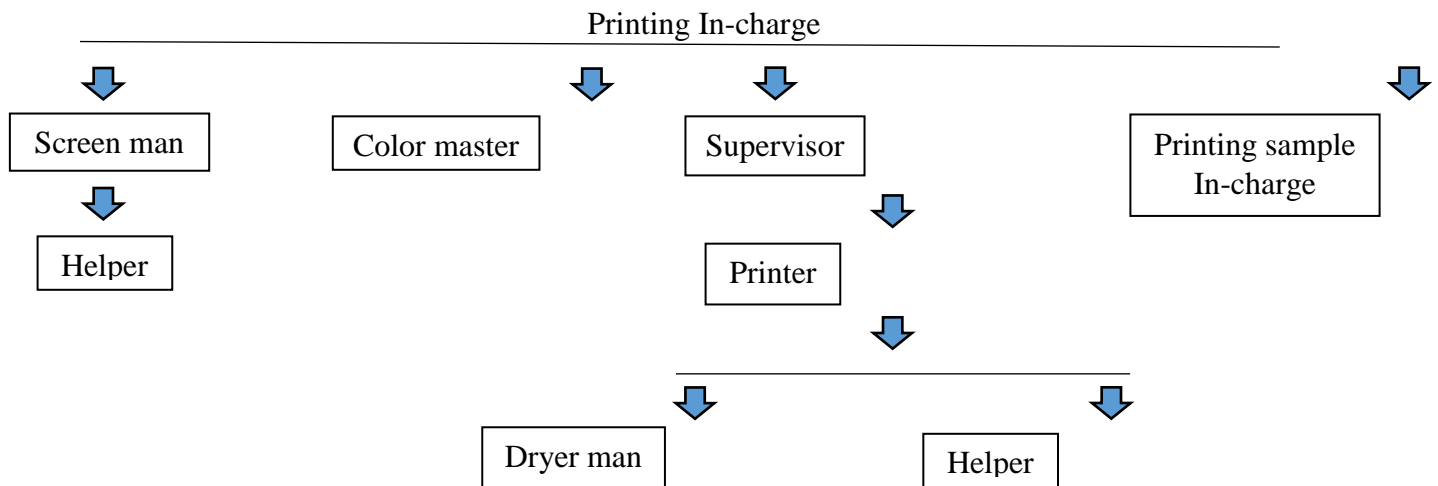
Fig: Fabric Printing m/c



Fig: Fabric Printing

Fig: Curing m/c

### 3.6.1 Printing Flowchart:

Art work
⬇
Design Printing
⬇
Design Develop
⬇
Film
⬇
Print Taken
⬇
Production Plan
⬇
Requisition from Merchandiser
⬇
Panel
⬇
Expose Frame Attachment
⬇
Water Spray
⬇
Panel Send To the Buyer
⬇
Buyer Approval
⬇
P.P Production
⬇
Accessories Bookings
⬇

Requisition Fabric from Merchandiser

Fabric Receive and Store

Inspection Fabric

Bulk Production

Curing

Inspection

Delivery
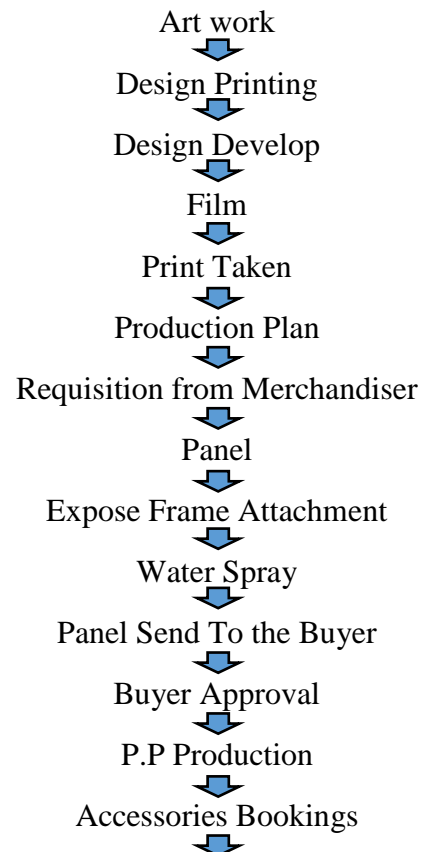
## 3.6.2 Printing Faults:

1. Miss fit
2. Wicking
3. Shade
4. Color bleeding
5. Color cracking

## 3.6.3 Types of Printing:

1. Discharge printing
2. Rubber printing
3. Transfer printing
4. Foil printing
5. Pigment printing
6. Burnout printing
7. Flock printing
8. Photo printing

## 3.7 Embroidery Section:



Fig: Embroidery m/c

Two types of threads are used in embroidery machine.
1. Polyester thread
2. Sewing thread

## 3.7.1 Machine Specification:

| Machine name | YUEMEI |
|---|---|
| Brand name | Mag Enterprise Ltd |
| Country of origin | China |
| M/C rpm | 850 |
| No of head | 15 |
| No of needle | 09 |
| No of bobbin | 15 |

## 3.7.2 Embroidery Faults:

1. Needle hole
2. Incorrect measurement
3. Thread break
4. Uneven embroidery
5. Uneven applique

## 3.8 Sewing Section:



In sewing floor different types of Sewing is used to join different parts of a garment. In a garment all parts are joined combined position by the help of many workers. Different parts of the garment are attached by different operators.

After making this finished garments are checked for final approaching. They are ready for packing, given tag, precaution tag and packed in plastic paper for avoiding different types of dust and giving a charming look.

## 3.8.1 Organogram of Sewing Floor:

Production manager
↓
Assistant production manger
↓
Line chief
↓
Supervisor
↓
Worker
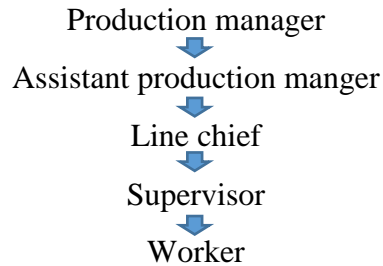
## 3.8.2 Machine Specification:

| Machine Type | Brand | Amount | Origin |
|---|---|---|---|
| Single Needle Lock Stitch | JUKI | 4500 | JAPAN |
| Over lock 4 Thread | JUKI | 245 | JAPAN |
| Over Lock 4 Thread Top Down | JUKI | 2 | JAPAN |
| Over Lock 4 Thread Back Latch | JUKI | 10 | JAPAN |
| Over Lock 4 Thread Cylinder Bed | JUKI | 5 | JAPAN |
| Over Lock 6 Thread | JUKI | 5 | JAPAN |
| Cylinder Bed Flat Lock | PEGASUS | 95 | JAPAN |
| Flat Bed Flat Lock | PEGASUS | 45 | JAPAN |
| Feed Of The Arm | YAMATO | 8 | JAPAN |
| Button Hole | JUKI | 15 | JAPAN |
| Button Stitch | JUKI | 3 | JAPAN |
| Bertack | JUKI | 7 | JAPAN |
| Pickuting | KANSAI | 3 | JAPAN |

### 3.8.3 Description of different types of sewing machine:

**Plain Machine:**

**Application:**

1. Pocket joint
2. Zipper joint
3. Belt joint
4. Flap joint stitch
5. Flap top stitch
6. Loop tack stitch



Fig: Plain Machine

**Over Lock Machine:**



Fig: Overlock Machine

**Application:**

1. Blind stitch
2. Sleeve attach
3. Garments edge
4. Side seam

## Flat Lock Machine:



Fig: Flat lock Machine

## Application:

1. Hem joint (bottom, sleeve, pocket)
2. Neck binding
3. Top stitch

## Button Attach Machine:



Fig: Button Attach Machine

## Application:

To attach button in garments.

## Button Hole Machine:



Fig: Button Hole Machine

## Application:

To make eye late hole in garments.

## Back Tape Machine:

## Application:

Shoulder to shoulder tape joint.

## Thread Re-coining Machine:

## Application:

Thread transfer cone to cone.

## Kansai PMD:

## Application:

Belt gathering with elastic.

**Single Needle Vertical Machine:**

**Application:**

Rib sewing and cutting.

### 3.8.4 Defects of Sewing:

1. Button insecure
2. Poor ironing
3. Needle mark
4. Open seam
5. Needle hole
6. Placket unbalance
7. Sleeve edge unbalance
8. Incorrect side shape
9. Insecure shoulder stitch
10. Double stitch
11. Stitch missing
12. Broken stitch
13. Thread breaking
14. Bottom hem bowing
15. Cross labels

### 3.8.5 Measurement Deviation:

In this process the garments measurements are compared to the customer measurements. Here, some of the measurements are given below:

1. Arm hole
2. Shoulder lengths
3. Body widths
4. Garment opening
5. Neck widths
6. Neck openings
7. Collar widths
8. Hemming widths
9. Sleeve lengths
10. Placket lengths
11. Placket widths
12. Arm opening

### 3.8.6 Standard Minute Value Calculation:

Standard minute value or SMV plays a vital role in garments industry. Generally, SMV refers to total time taken to make garment. It is expressed in minute. For proper shipment procedure a merchandiser need to adopt with SMV and the supplier or buyer can calculate time for final product.

SMV= Basic time + Allowance

Where,

Basic time = Observed time * Rating/100

### 3.8.7 Required SMV For Different Garments:

| S/L | Garments | SMV |
|-----|----------|-----|
| 1. | Jeans pant | 12-15min |
| 2. | Men's polo shirt | 12-15min |
| 3. | Full sleeve shirt | 16-20min |
| 4. | V-neck T-shirt | 4-5min |
| 5. | Women's top | 3-4min |

## 3.9 Finishing Section:



## 3.9.1 Organogram of Finishing Section:

Manager

Assistant Manager

Staff

Worker

Helper
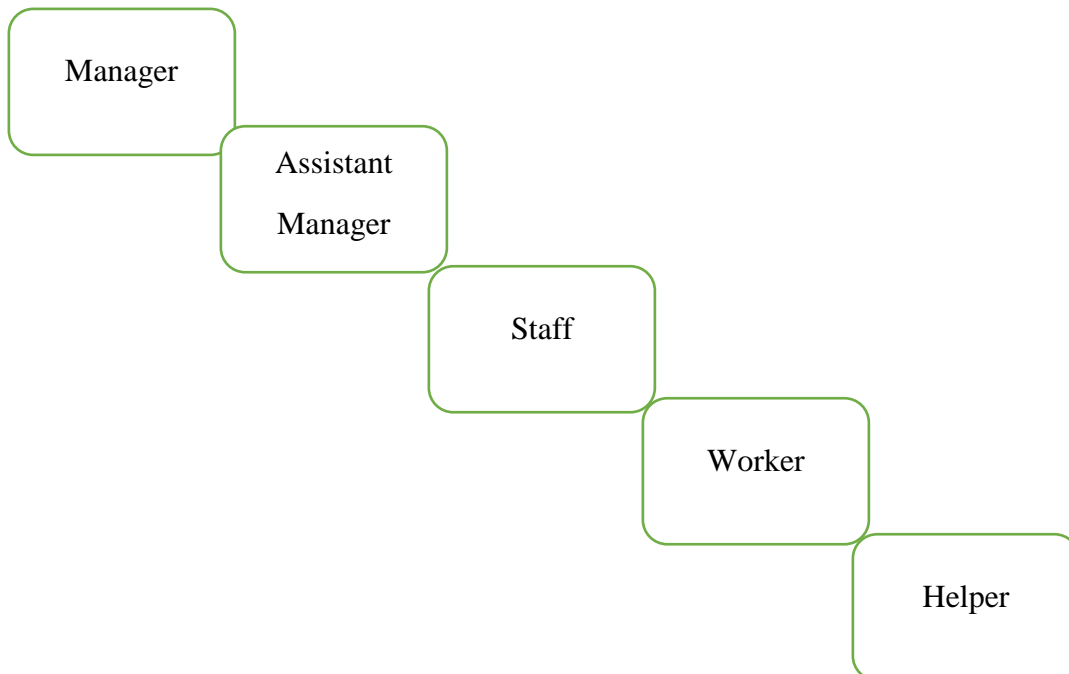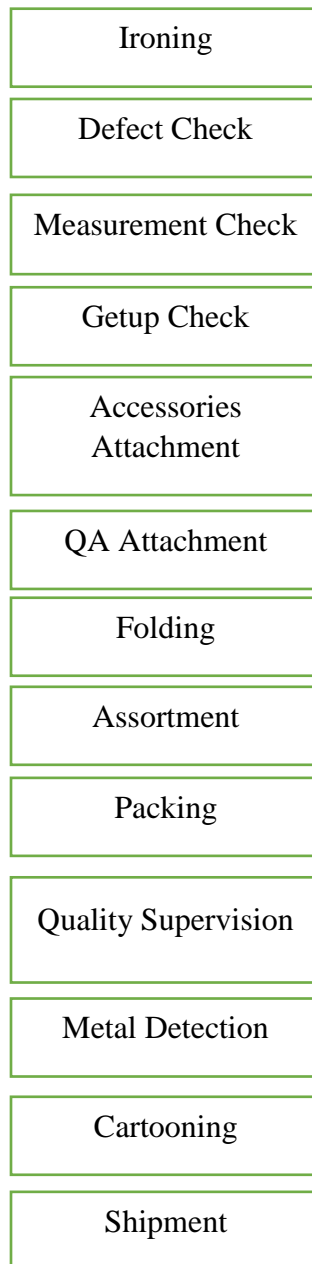
### 3.9.2 Process of Garment Finishing:

Garment finishing is the last step of garments making. The main procedures are packing, folding, calendaring and so on.

### 3.9.3 Flow Chart of Garment Finishing:

Ironing

Defect Check

Measurement Check

Getup Check

Accessories Attachment

QA Attachment

Folding

Assortment

Packing

Quality Supervision

Metal Detection

Cartooning

Shipment

### 3.9.4 Garment Pressing:



Fig: Pressing

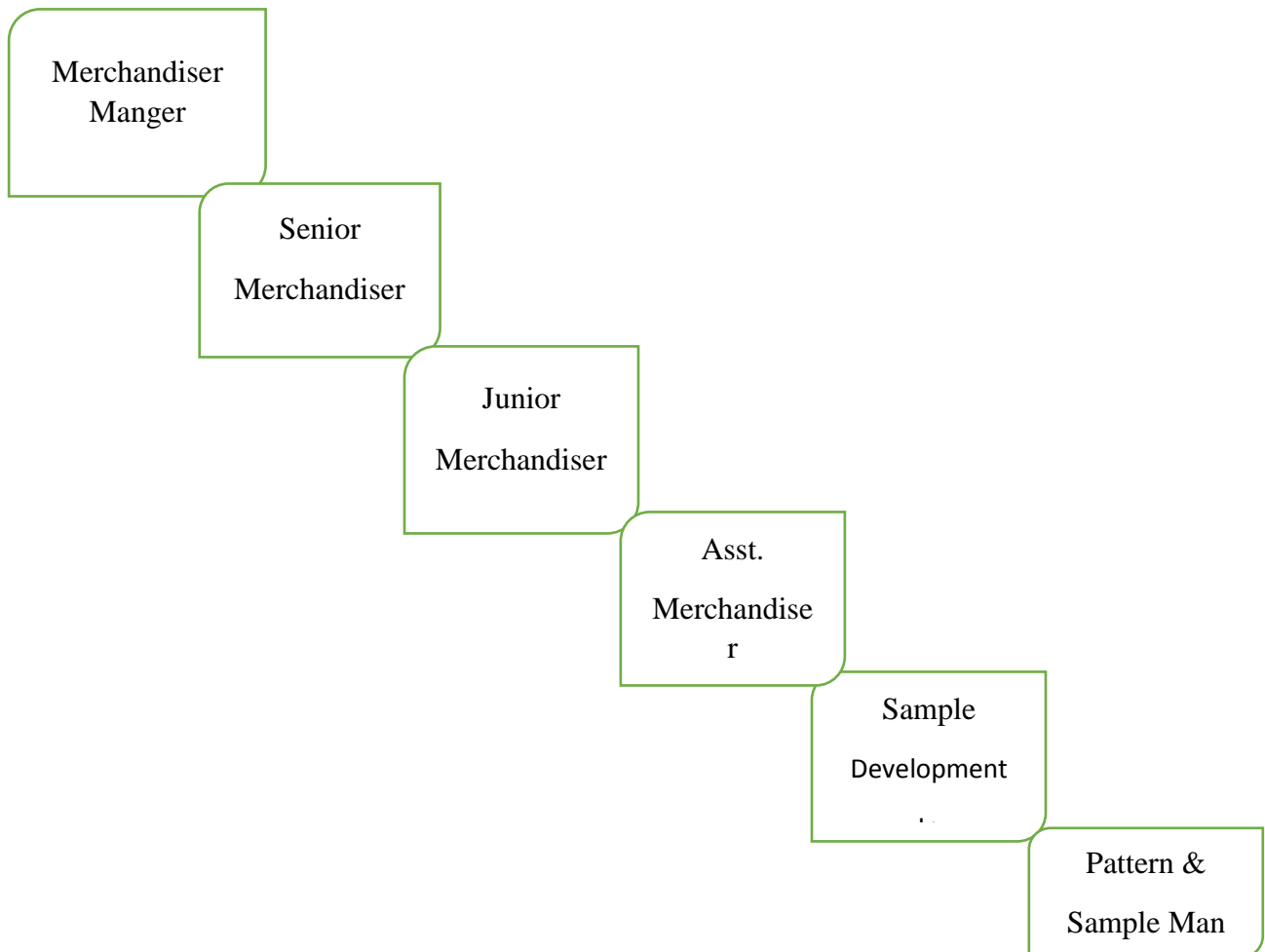### 3.9.5 Folding:



Fig: Folding

### 3.9.6 Packing:



Fig: Packing

A tag and barcode is attached with the garment according to buyers demand. Sorting the specific amount of garment for cartooning and it goes through metal checking such as broken needle, zipper and button.
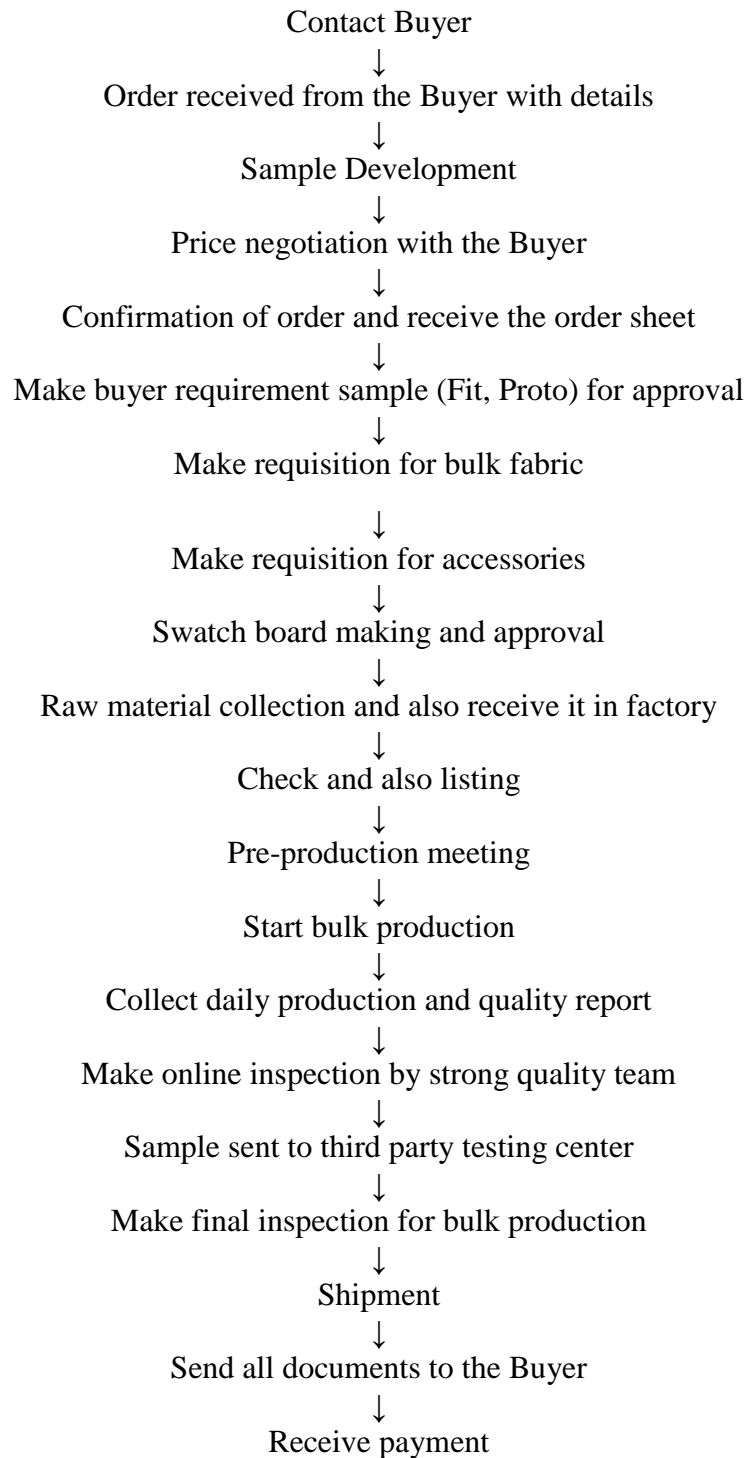
## 3.10 Merchandising:

Merchandising department plays an important role for the development of any factory. They are the key role persons who conduct with buyers and instruct factory for the required delivery.

## 3.10.1 Organogram of Merchandising Department:

Merchandiser Manger

Senior Merchandiser

Junior Merchandiser

Asst. Merchandiser

Sample Development

Pattern & Sample Man

## 3.10.2 Flow Chart of Merchandising Department:

Contact Buyer
↓
Order received from the Buyer with details
↓
Sample Development
↓
Price negotiation with the Buyer
↓
Confirmation of order and receive the order sheet
↓
Make buyer requirement sample (Fit, Proto) for approval
↓
Make requisition for bulk fabric
↓
Make requisition for accessories
↓
Swatch board making and approval
↓
Raw material collection and also receive it in factory
↓
Check and also listing
↓
Pre-production meeting
↓
Start bulk production
↓
Collect daily production and quality report
↓
Make online inspection by strong quality team
↓
Sample sent to third party testing center
↓
Make final inspection for bulk production
↓
Shipment
↓
Send all documents to the Buyer
↓
Receive payment

Authorized merchandiser order the knitting, dyeing, finishing, cutting department to develop the sample for buyer requisition. After getting the final approval from the byer it goes to bulk production.

# Chapter – 4
# Impact of Internship

## 4.1 Knitting Section:

- Learned about different parts of machine.
- Learned about different kinds of knit fabrics.
- Learned about knitting procedures.
- Learned about knitting order and requirements.
- Learned about machine maintenance.

## 4.2 Dyeing Section:

- Learned about the dyeing processes.
- Learned about the dyeing machine maintenance.
- Learned about the faults occurred during dyeing.
- Learned about the re-matching of color.

## 4.3 Finishing Section:

- Learned about the functions of stenter, compactor and dryer machine.
- The objectives of finishing.
- Learned about the chemicals used in finishing.

## 4.4 Cutting Machine:

- Learned about different types of cutting machine.
- Faults occurred during cutting.
- Cutting precautions.
- Learned about fabric layout.
- Understood how numbering and bundling is done.

## 4.5 Printing Section:

- Learned about different types of printing.
- Learned about different chemicals operation.

## 4.6 Sewing Section:

- Learned about different types of sewing machine.
- Different types of sewing.
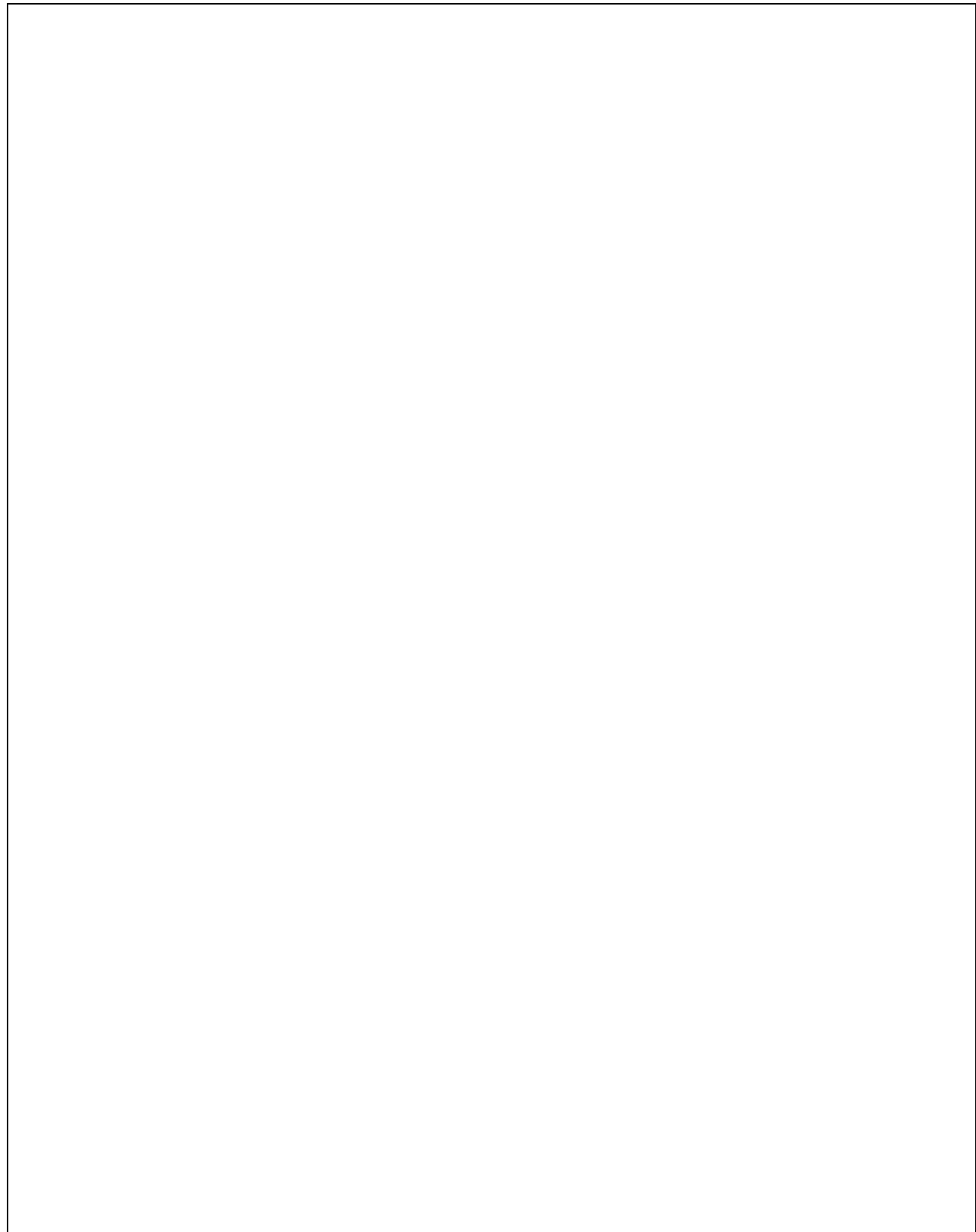- Learned about working procedures of sewing floor.

## 4.7 Garments Finishing Section:

- Learned about garments packing.
- Learned about garments inspection.
- Observed different procedure in washing and drying.

# Chapter – 5

# Samples
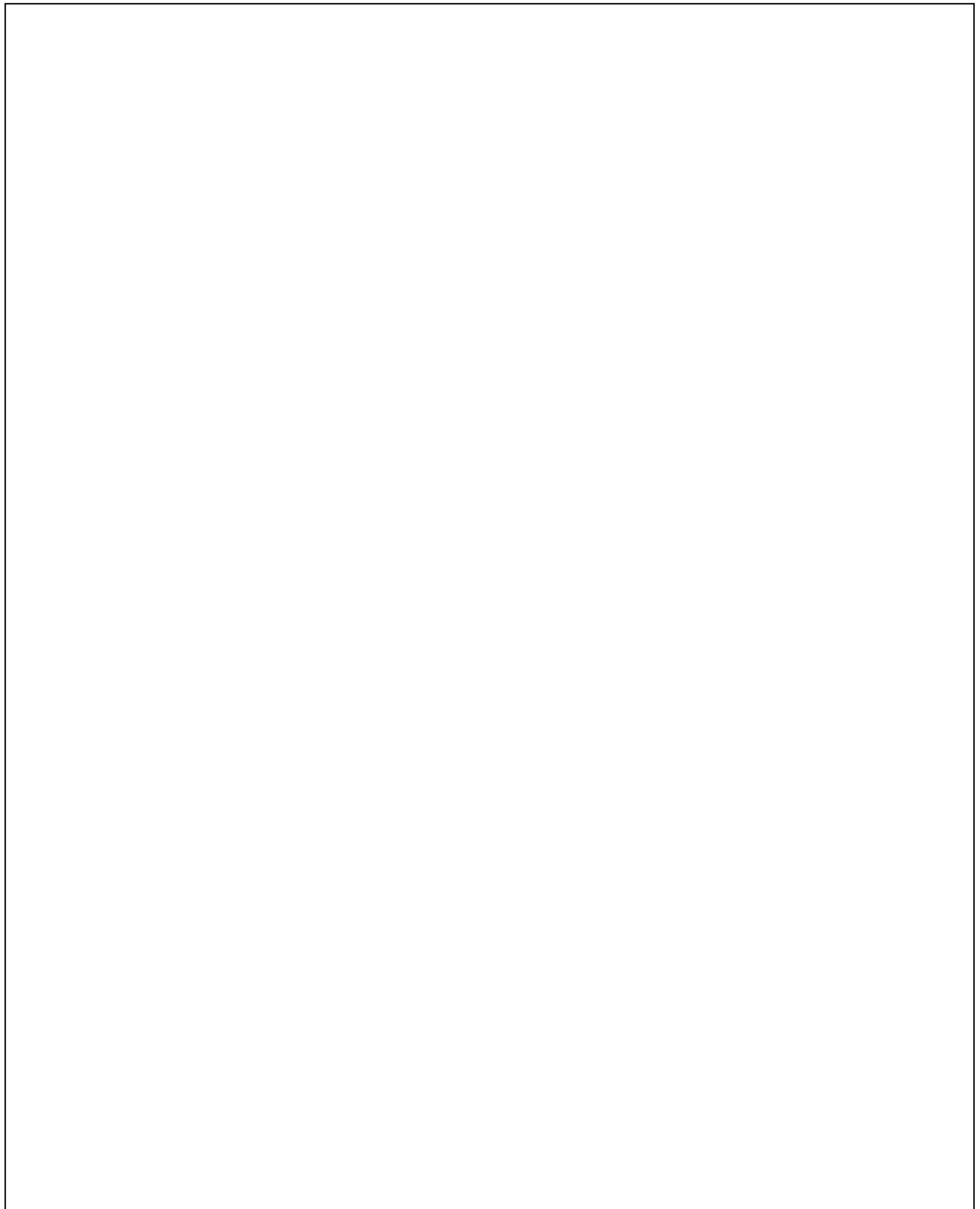
# Chapter – 5

# Conclusion

## Conclusion:

Almighty Allah has allowed us to complete our internship report successfully, Alhamdulillah.

Industrial attachment serves the learning opportunity to raise the inquisitiveness of our consciousness to proceed to the real life. **H.R Textile Mills Ltd. (Pride Group)** is a renowned industry in the textile field of Bangladesh. Administration, chain of command all are well maintained. The industry is loaded with modern day technology and machineries which are ahead of the time and also safe to work with. The working environment is superb. The rapport between the higher authorities of the industry to the bottom level is so nice. They all are adherent to meet the customer assertion by their activities.

The industry is running with a number of proficient textile engineers, skillful technical and non-technical individuals. They are very sincere, co-operative and adjuvant.

All the information about **H.R Textile Mills Ltd. (Pride Group)** in this report is so practical that one can get the desired information about the industry.