



**Faculty of Engineering**

**Department of Textile Engineering**

**REPORT ON**  
**Industrial Attachment**  
**At**  
**Graphics Textiles Ltd.**  
**Sreerampur, Sutipara, Dhamrai, Dhaka,**

**Course Title: Industrial Attachment**  
**Course Code: TE-410**

**Submitted By:**

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Bachelor of Science in Textile Engineering.

**Advance in Apparel Manufacturing Technology**  
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# ACCEPTANCE

The training report is prepared by using the relevant documents related to the assigned instructions written by **ABU BAKKER SIDDIK** , Batch 17<sup>th</sup> , student of Textile Engineering Department..Daffodil International University has been acknowledged as it is acceptable.

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# ACKNOWLEDGEMENT

Industrial training is a practical oriented work in a running textile industry where I have got the chance to see the different operation involved in production process practically. A number of people have made significant contributes in preparing this report, their advices, suggestions and guidance helped us a lot.

First of all our gratefulness goes to almighty Allah to give us strength and ability to complete the industrial training and this report.

I would like to give special thanks to **Md. Mominur Rahman**, Senior Lecturer, Department of TE, Daffodil International University. Deep Knowledge & keen interest of our supervisor in the field of influenced us to carry out this report. His endless patience ,scholarly guidance ,continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior drafts and correcting them at all stage have made it possible to complete this report.

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I have gratitude the Chairman, Managing directors, General Manager, Production manager, merchandising manager, Administration manager who gave me scope for doing industrial attachment in the factory as well as for giving scope to work in their respective section.

I would like to thank my entire course mate in Daffodil International University, who took Part in this discuss while completing the course work.

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*CHAPTER 1:*  
**EXECUTIVE SUMMERY**



## **I. Introduction:**

Textiles and garments sector is the biggest and fastest growing sector in Bangladesh. Textiles and clothing will always be essential goods for human beings. Spinning and weaving were the main activities that drove the Industrial Revolution in the 18<sup>th</sup> century. Since then the textile industry has been a leading industry in the initial phase of industrialization in many countries in different periods of time in the world. Bangladesh is an important producer & exporter of knit RMG product. There are about 4500 garments factories running in Bangladesh. Growth of garments factories started in Bangladesh around 1980. But now nearly 79% of our foreign currency is earned from RMG export. At present Bangladesh is producing & exporting more than 60 items of garments. Garments are exported to USA, Canada, Japan, Australia, Middle East and many other countries in the world. Cheapest labor cost is the biggest advantage for Bangladeshi garments producers & exporters.

Science is going to be flourished day by day. Almost every invention becomes successful due to the development of science. Technology, the modified segment of science, makes the thing possible, which was impossible yesterday. Education provides important leanings of the modern inventions and the theories and also gives me a combined knowledge over theoretical and practical studies. Literatures provide the right information which I have been learned through my university. On the other hand practical knowledge increases the practice of theoretical perception clear and more efficient.

Internship has made this opportunity. Because I have learned theoretical knowledge last four years but due to lack of proper industrial knowledge on my course, I would not been said a complete engineer. Industrial attachment did work for me. I have taken part in this industrial attachment in **Graphics Textiles Ltd.**

**Graphics Textiles Ltd.** is one of the renowned 100% export oriented industry in Bangladesh. The factory is concern with the production in knitting, knit dyeing and finishing and knit garments. Due to the change in current scenario, the textile sector is facing a great challenge here.

**Graphics Textiles Ltd** is completely prepared to face this situation. The goal of **Graphics Textiles Ltd** is to become the preferred partner for sourcing high quality fabrics and clothing from Bangladesh. GTL has highly developed advance technology and an emphasis on developing local human resources. The Textile Division has the potential to make an important contribution to the nation's growing RMG export sector.

The rationale behind the existing structure and future expansion of the Textile and fiber Division is to capture value-added at each stage of the textile manufacturing process. Despite Bangladesh is lack of indigenous cotton production capability, it is enjoying lower labor cost advantage and export competitiveness to the maximum.

This factory is fully complained and very much concern about the labor law and compliances. This factory is also concerned about environmental issues as they have well established Effluent Treatment Plant (ETP). In **Graphics Textiles Ltd I** have completed seventy day long industrial training in knitting, dyeing and finishing and garments section. During the training period I faced a lot of technical problems, which I have solved by consulting with the related persons. Whatever the knowledge I have gain during my training period, it will help me to build up my career as a Textile Engineer.

# *CHAPTER-2*

# **COMPANY PROFILE**



## **2. Company Profile:**

### **2.1 History:**

Graphics Textiles Ltd is a private Limited Company, established in 2006, with the manufacturing and export of dyed and finished knit fabrics. Graphics Textiles Ltd has expanded its business network by exploring various fields of textiles through its relentless efforts. The group's vision is to produce the latest designs; quality knit fabrics and apparels that continuously meet the ever-changing demand of international markets.

To meet the exceeding expectations of international customers, the company has deployed skilled human resources with technical know how and world class modern machineries and equipment's from Europe.

### **2.2 Address:**

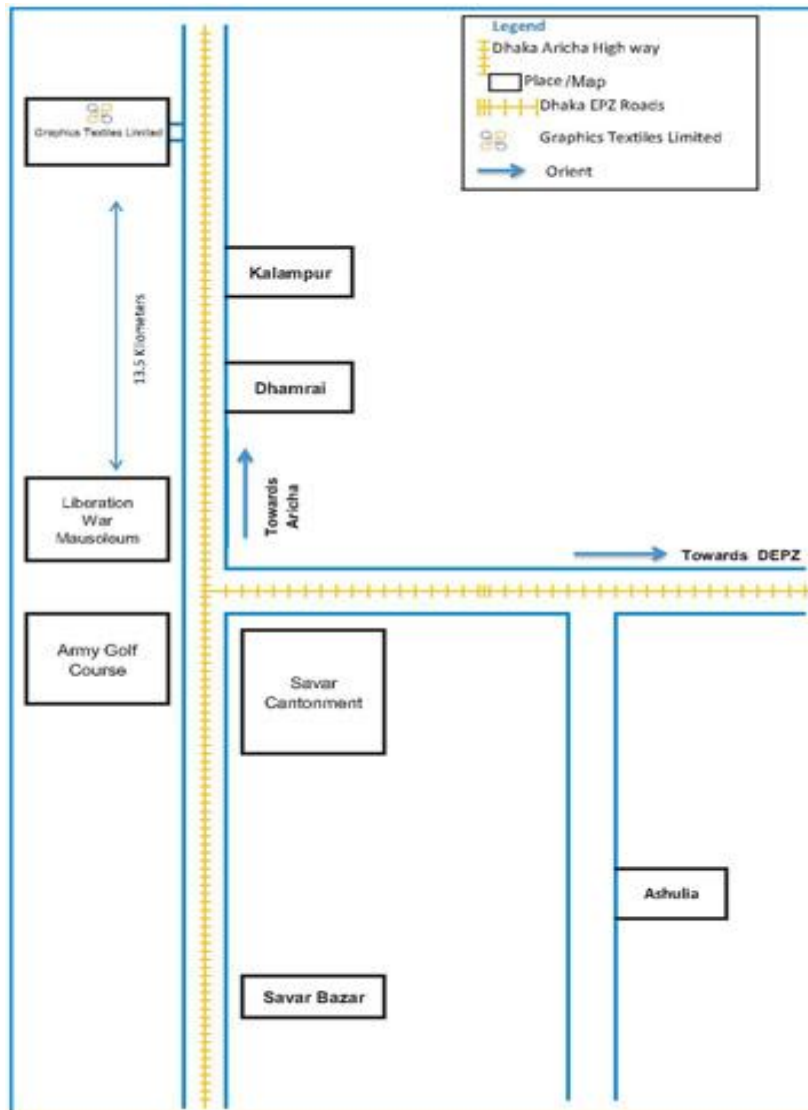
#### **❖ Factory**

Sreerampur, Sutipara,  
Dhanmrai, Dhaka, Bangladesh  
Phone: +8809613224488  
Tel: +8801730019945  
Fax: +88028819472-3

#### **❖ Head office**

225, Tejgaon I/ A,  
Dhaka-1208, Bangladesh  
Tel: +88028819464  
Fax: +88028819472-3

## 2.3 Factory Location :



## 2.4 Management:

- ✓ Najib Malek Chowdhury-Managing Director
- ✓ Warid Malek Chowdhury- Director operation
- ✓ K.Feroz qayyum- Director Finance
- ✓ Ethesham H Khan- Director Logistics
- ✓ Liaquat Hosssain- Executive Director

## **2.5 Product:**

- T-shirt(Men's & Ladies)
- polo Shirt
- Pants
- Jacket
- Tank top
- Sweatshirt
- Trouser
- Long sleeve
- Kids knitwear
- Underwear
- Cardigan
- All kinds of knit garments and knit fabric.

## **2.6 Major Buyers Name:**

- Otto
- Russell Europe
- H&M
- KappAhl
- Kappa
- Bonprix
- ZXY
- Cos
- Gymburee
- Organic cotton
- Zara
- OVS

## 2.7 GTL Standard:

- **Month wise Knitting capacity**

Fabrication	Qty in ton
1.Single jersey	<b>176.4</b>
2.Double jersey	<b>50.4</b>
Total	<b>228.4</b>

- **Dyeing Capacity**

Fabrication	Qty in ton
1.Lycra Fabric	<b>40</b>
2.Cotton	<b>110</b>
3.Pc/Tc/Cvc	<b>30</b>
Total	<b>180</b>

- **Month wise Sewing Capacity**

Garments Type	Qty in pcs
1.Basic item	<b>807000</b>
2.Polo item	<b>402000</b>
Total	<b>1209000</b>

## 2.8 Transport Facilities:

- No. of bus -33 (for worker)
- No. of bus -1 (for stuff)
- No. of microbus -05
- No. of cover van - 03
- No. of car -14

- No. of Ambulance -01

## **2.9 Training and Development:**

- Fire fighting and Evacuation
- First aid.
- Health and hygiene.
- General awareness.
- Company policy.
- Cleaning Procedure.
- Quality ensure,
- Personal protective.
- Time management.
- Entry Harassment.

## **2.10: Floor space of each section:**

- Basement-18000 SQ FEET
- Ground floor-51778 SQ FEET
- Dyeing floor-40000 SQ FEET
- 1<sup>st</sup> floor-18000 SQ FEET
- 2<sup>nd</sup> floor-51778 SQ FEET
- 3<sup>rd</sup> floor-34882 SQ FEET
- 4<sup>th</sup> floor – 42353 SQ FEET
- 5<sup>th</sup> floor -42353 SQ FEET

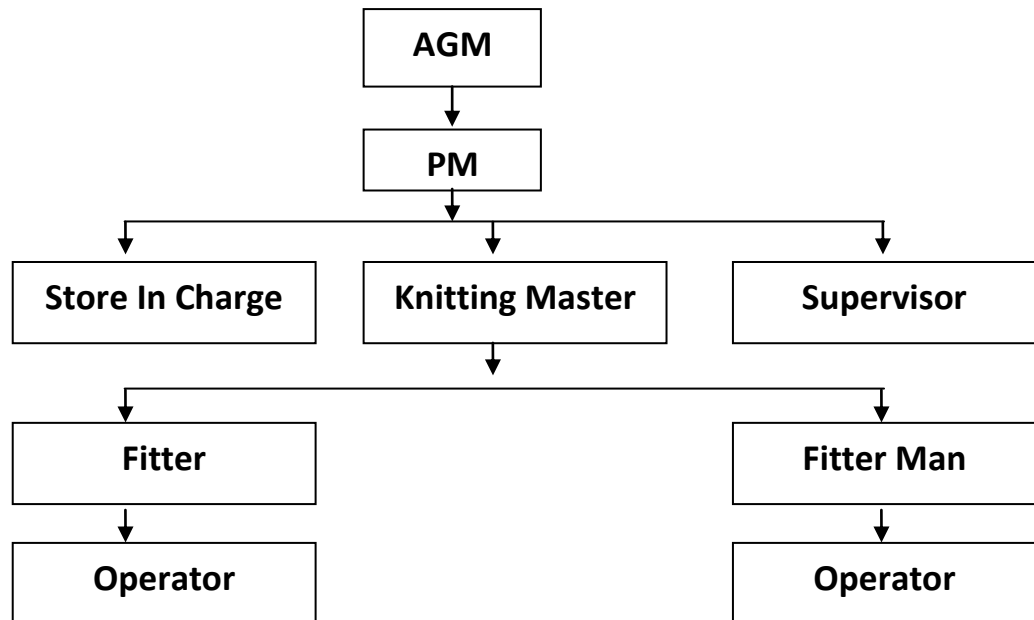


## *CHAPTER-3*

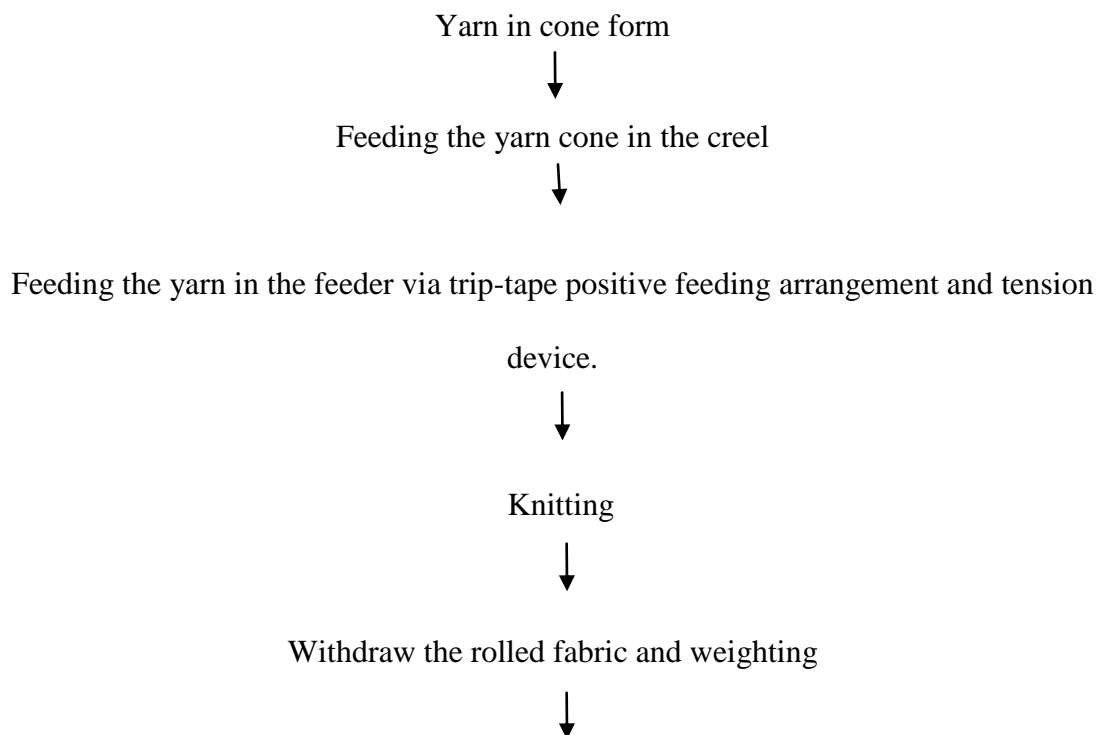
# **DESCRIPTION OF THE ATTACHMENT**

### 3.1 Knitting Section:

#### 3.1.1 Organ gram of Knitting Section:



#### 3.1.2 Flow Chart of Knitting Section



Inspection



Number

### 3.1.3 Types of yarn used:

Composition	Type	Yarn Count	Color	Ply
Cotton	Card	20s,22s,26 s, 30 s,32s,34s,36s,40s	Natural	Single
Cotton	Comb	18s,20s,24 s, 26 s, 30 s	Natural	Single
Spandex Yarn		20 D, 40 D, 70 D	Natural (white)	Single
Grey Mélange		20 s, 30 s	Dyed	Single
CVC		26 s		Single
Cotton	Dyed	26 s, 30 s		Single
PC (65% Polyester 35% Cotton)		24 s, 26 s, 30 s		Single
Viscose		30, 26, 40		Single
Knot less yarn cotton	Carded yarn	20/2		Single

### 3.1.4 Source of yarn for knitting:

- *Cotton:*

Local:

- ✓ Square Spinning Mill.

- ✓ Farha Spinning Mill .
- ✓ Thermex group.
- ✓ Energy Spinning Mill.
- ✓ Bengal Spinning Mill.
- ✓ Asia spinning mill

Imported:

- ✓ Loyal spinning
- ✓ RSWM
- ✓ Alps

- *Polyester:*

Local:

- ✓ Kader Synthetic

Imported:

- ✓ D.N.H Spinner
- ✓ Toung Long
- ✓ Well known
- ✓ Xiamen
- ✓ Perstern

### 3.1.5 Yarn Quality Requirements:

#### ➤ Yarn quality parameters:

1. Evenness,
2. Breaking strength,
3. Elongation,
4. Twist,
5. Moisture contents,
6. Yarn winding,
7. Yarn lubrication,
8. Yarn hairiness is to be considered for quality raw material feed to knitting.

### 3.1.6 Fabric produced in knitting:

Single Jersey	Double Jersey
1. Single jersey (plain)	1. 1x1 Normal Rib
2. Single Lacoste	2. 1x1 Lycra Rib
3. Double Lacoste	3. 2x2 Normal Rib
4. Polo Pique	4. Interlock
5. Fleece fabric	
6. PK fabric	
7. Terry	

### 3.1.7 Types of Machine in Knitting Section:

Machine type	Dia	Quantity
Single jersey and	30",32",34",36",40"	22 pcs
double jersey	32",34",36",	5 pcs
Flat knitting	68"	05
Re-coning machine	8 Head	01
Fabric inspection machine		01



Fig: Circular knitting machine (single jersey)



Fig: Circular knitting machine (Double jersey)



Fig: Fabric inspection machine



Fig: Flat knitting Machine

### **3.1.8 Quality Control of Knitting Section:**

To produce high quality fabric it is necessary to inspect the fabric roll after receiving from different machine. This is done to assure the quality when produce fabric of the fabric before dyeing. List of equipment's used in inspection

- a. Inspection m/c
- b. Electronic balance
- c. GSM cutter



➤ **Inspection Procedure:**

As the fabric is produced by the circular knitting machine it is then collected by the quality inspector and the fabric is thoroughly inspected in m/c. During this inspection the holes, oil marks, sinker marks, needle marks etc are checked. If the fabric is within the acceptance level (by 4 point system) then it is sent to the batch section for dyeing or delivery.

➤ **Quality Standard**

**Graphics Textiles Ltd** Follows the four point grading system to inspect the body & rib of the fabric. In the 4 point system the faults are found by inspection and are given points against the fault. Then the total no. is calculated. The following table shows the 4 point system.

Size of defects	Point
3 inches or less	1
Over 3 inches but not over 6 inch	2
Over 6 inches but not over 9 inch	3
Over 9 inches	4
Any hole	4

Calculate points per 100square yards fabric:

$$\frac{\text{Total points fault}}{\text{Role length(yds)}} \times \frac{36}{\text{useable width(inch)}} \times 100 = \text{points/100yds}$$

Acceptable fault length should not be higher than 28 points.

### 3.1.9 Production Calculation:

- A. Production/shift in kg at 100% efficiency:

$$\frac{\text{RPM} \times \text{No. of Feeder} \times \text{No. of Needle} \times \text{SL(mm)}}{3527.80 \times \text{Yarncount}}$$

- B. Production/shift in meter:

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

$$\frac{\text{RPM} \times \text{No. of Feeder} \times 60 \times 12 \times \text{Efficiency}}{\text{Course / cm} \times 100}$$

- C. Fabric width in meter:

$$\frac{\text{Total no. of wales}}{\text{Wales /cm} \times 100}$$

$$\frac{\text{Total no. of Needles used in knitting}}{\text{Wales / cm} \times 100}$$

### **3.1.10 Faults & Their Causes in Knitting:**

#### **1. Hole Mark**

##### **Causes:**

- Holes are the results of yarn breakage or yarn cracks.
- During loop formation the yarn breaks in the rejoin of the needle hook.
- If the yarn count is not correct on regarding structure, gauge, course and density.
- Badly knot or splicing.
- Yarn feeder badly set.

##### **Remedies:**

- Yarn strength must be sufficient to withstand the stretch as well as uniform.
- Use proper count of yarn.
- Correctly set of yarn feeder.
- Knot should be given properly.

#### **2. Needle Mark**

##### **Causes:**

- When a needle breaks down then needle mark comes along the fabrics.
- If a needle or needle hook is slightly bends then needle mark comes on the fabrics.

##### **Remedies:**

- Needle should be straight as well as from broken latch.

#### **3. Sinker Mark**

##### **Causes:**

- When sinker corrode due to abrasion then some times can not hold a new loop as a result sinker mark comes.
- If sinker head bend then sinker mark comes.

**Remedies:**

- Sinker should be changed.

#### **4. Star Mark**

**Causes:**

- Yarn tension variation during production.
- Buckling of the needle latch.
- Low G.S.M fabric production.

**Remedies:**

- Maintain same Yarn tension during production.
- Use good conditioned needles.

#### **5. Drop Stitches**

**Causes:**

- Defective needle.
- If yarn is not properly fed during loop formation i.e. not properly laid on to the needle hook.
- Take-down mechanism too loose
- Insufficient yarn tension.
- Badly set yarn feeder.

**Remedies:**

- Needle should be straight & well.
- Proper feeding of yarn during loop formation.
- Correct take up of the fabric & correct fabric tension.

- Yarn tension should be properly.

## **6. Oil stain**

### **Causes:**

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

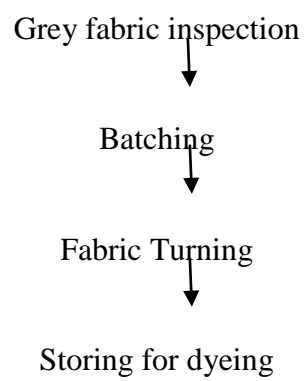
### **Remedies:**

- Ensure that oil does not pass on the fabrics.

## 3.2 Batching



### 3.2.1 Batch process follow-up:



### 3.2.2 Function or Purpose of Batch Section:

- To receive the grey fabric roll from knitting section or other source.
- Turn the grey fabric if require.
- To prepare the batch of fabric for dyeing according to the following criteria –
  - Order sheet (Received from buyer)
  - Dyeing shade (color or white, light or dark)
  - M/C capacity
  - M/C available
  - Type of fabrics(100% cotton, PVC, PC, CVC)
  - Emergency
- To send the grey fabric to the dyeing floor with batch card.
- To keep records for every previous dyeing.

### Proper batching criteria:

- To use maximum capacity of existing dyeing m/c.
- To minimize the washing time or preparation time & m/c stoppage time.
- To keep the no. of batch as less as possible for same shade.
- To use a particular m/c for dyeing same shade.

### 3.2.3 Batch Management

#### Type of Batch:

01). Solid Batch

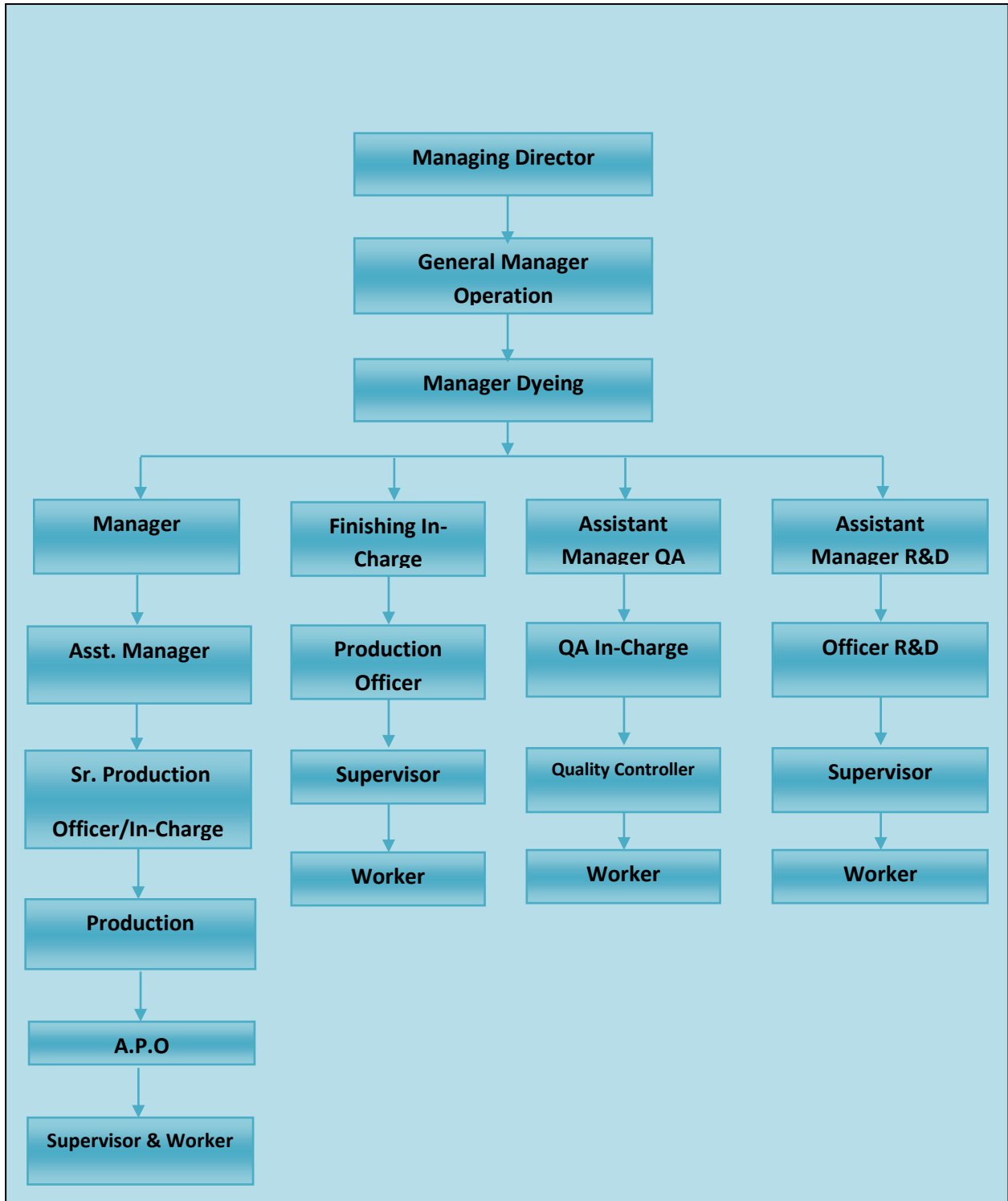
02). Ratio Batch

**Solid Batch:** In solid batch all sample are same size, same diameter, same GSM, same fabric. For example; GSM is 160, diameter is 60", and fabric type is single jersey.

**Ratio Batch:** In ratio batch sample are different size, different diameter, different GSM, different fabric. For example; GSM are 160; 180; 200; diameter are 45"; 50"; 56"; 60", fabric type is single jersey; (1\*1) rib; (2\*2) rib; (1\*1) interlock, color size are (38\*9; 40\*9; 42\*9; 45\*9), cuff size are(38\*3; 39\*3; 40\*3; 42.5\*3).

### 3.3 Dyeing Section:

#### 3.3.1 Organ gram:





### **3.3.2 lab dip Preparation:**

#### **➤ Introduction:**

Lab-dip is nothing but a process by which buyers supplied swatch is matched by varying percentage in the laboratory with or without help of “DATA COLOUR”. Prior to the bulk production, lab-dip plays a vital role in shade matching & detaching the characteristics of the dyes and chemicals to be used in the large scale of production, thus it is an important task before bulk production.

#### **➤ Definition:**

Lab Dip Development means the sample which is dyed according to buyer's requirements (similar shade and so on). Depending on lab dip development sample dyeing and bulk production dyeing planning done.

#### **➤ Objective of lab dip preparation:**

**The main objectives in lab dip are as follows.**

- To calculate the recipe for sample dyeing.
- To compare dyed sample with swatch by light Box or Spectra flash.
- To calculate revise recipe for sample dyeing.
- Finally approved Lab Dip (Grade: A B C)

GTL has a well-established laboratory with modern machines and equipment's.

### 3.3.3 Machineries for lab dip Preparation:

➤ **Machine Name:**

**1. Spectro flash:** To indicate color in to the computer monitor. & show the value of different color to use in the fabric.

Company : Data Color

Origin : USA

**2. Light box:** This includes 4types of light-

-TL84

-D65

-Florescent

-Ultraviolet

After dyeing of lab sample completes, then it is compared from buyer sample or buyer design or buyer requirement of a fabric.

### 3.3.4 Preparation and Storage of stock dyes and Chemicals:

➤ Preparation of Concentration of stock dye solution –

Normally 0.1%, 0.5%, 1%, 1.5% and 2% stock solution of dyes are prepared in beakers for daily used.

For 1% stock solution: 1 gm. dye + 100 cc water

For 5% stock solution: 5 gm. dye + 100 cc water

For 0.1% stock solution: 10 cc dye stock solution + 90 cc water

For 0.01% stock solution: 1 cc dye stock solution + 99 cc water.

- Preparation of Concentration of stock chemical sol -

Similarly 25% salt and 25% soda stock solutions are prepared in beakers for daily use.

### 3.3.5 Dyes and chemicals measuring formula for Laboratory:

- The amount of dye solution (ml) is calculated as follow –

$$\text{❖ Amount of dye solution (ml)} = \frac{\text{Fabric weight} \times \text{Shade \%}}{\text{Concentration of stock dye solution \%}}$$

Example –

In recipe, Fabric wt. = 5gm

Shade % = 2%

[If used 0.5 % stock solution of dyes] then,

$$\text{Amount of dye solution (ml)} = \frac{5 \times 2}{0.5} = 20\text{ml.}$$

- The amount of chemical solution (ml) is measured as follow –

$$\text{Fabric wt.} \times \text{M: L} \times \text{g/l}$$

$$\text{Amount of chemical solution (ml)} = \frac{\text{Fabric wt.} \times \text{Conc. of stock solution \%}}{1000}$$

Example –

In recipe, The Fabric wt. = 5 gm

Salt = 20 g/l

M: L = 10

[If taken 25 % stock soln. of salt] then,

$$\text{Amount of chemical solution (ml)} = \frac{5 \times 10 \times 20}{1000 \times 0.25} = 4 \text{ ml}$$

### 3.3.6 Machineries in Dyeing Finishing Section:

Name	Quantity	Brand
Squeezer	01	Corino
Auto slitting	02	Corino
Dryer 3 Chamber	01	Entema
Stenter-8 Chamber	01	LK
Compactor	02	Lafar
Hydro extractor	03	Asian Star
Tumble dryer	06	Asian Star



Fig: Dyeing machine



Fig: Slitting Machine



Fig: Compactor machine



**Fig: Stenter Machine**

**3.3.7 Name of the Lab Test Equipment:**

Machine Name	Name of Company	Country
Electrolux washcator	James H.Heal &Co.Ltd	Halifax England
Electrolux Tumble Dryer	.....	.....
Gyro wash	.....	.....
Incubator	James H.Heal &Co.Ltd	Halifax England
Crock master	James H.Heal &Co.Ltd	Halifax England
Orpitor pilling and	James H.Heal &Co.Ltd	Halifax England

snagging tester		
Truburst	James H.Heal &Co.Ltd	Halifax England
GSM cutter	James H.Heal &Co.Ltd	Halifax England
Microprocessor PH meter	James H.Heal &Co.Ltd James H.Heal &Co.Ltd	Halifax England
Electronic balance	.....	.....
Twisting Tester	James H.Heal &Co.Ltd	Halifax England
Yarn examining Machine	James H.Heal &Co.Ltd	Halifax England
Reel measuring machine	James H.Heal &Co.Ltd	Halifax England

### 3.3.8 Dyeing Faults:

#### ■ Uneven Dyeing:

##### Causes:

- If pretreatment is not accurate
- Improper addition of chemicals
- Improper addition of color
- Using dyes of high fixation properties
- Less control of dyeing machine
- Less circulation time
- Improper loading of fabrics in m/c (In case of heavy jersey fabrics)

##### Remedies:

- By ensuring even pretreatment
- By proper addition of color and chemicals
- Correct circulation time
- By controlling the dyeing machine properly by maintenance.
- Proper calculation in batch section

#### ■ Batch to batch shade variation:



**Causes:**

- Using different dyes and chemicals in each batch
- Incorrect pretreatment procedure
- Batch to batch weight variation of fabric
- Improper dosing of dyes and chemicals
- Different m/c condition
- Worker negligence.

**Remedies:**

- By using standard dyes and chemicals in each lot
- By correcting the pretreatment procedure
- By maintaining batch to batch weight variation
- By avoiding lot mixing of dyes and chemicals
- By correcting the dosing time of dyes and chemicals
- By following different dyeing parameter
- By keeping the m/c in same condition.
- Minimizing the worker negligence.

**■ Dark colored spots:****Causes:**

- Dyestuff precipitation during dyeing
- Incompatibility of dyestuff used for producing combined shade
- Too high dyestuff concentration in the dyeing bath

**Remedies:**

- By ensuring proper dyeing condition
- By selecting proper dyestuff
- By checking the solubility limit of the dyestuff before dyeing
- By ensuring proper after treatment

#### ■ Patchy dyeing:

##### Causes:

- Due to hardness of water
- Due to faulty color addition
- Due to faulty injection of alkali
- Due to improper salt addition
- Due to improper pH of the solution

##### Remedies:

- By using proper sequestered
- By correcting the color addition
- By correcting the salt addition
- By proper injection of alkali
- By maintaining the pH level of the solution

#### ■ Crease mark:

##### Causes:

- Poor opening of the fabric rope
- Due to high speed of m/c running
- Unequal pump pressure and reel speed

##### Remedies:

- By maintaining proper pump pressure and reel speed
- By controlling the speed of the machine
- Correct opening of the fabric rope

#### ■ Roll to roll variation:

##### Causes:

- Poor migration property of dyes
- Hardness of water
- Improper dyes solubility
- Faulty machine speed

**Remedies:**

- Use standard dyes and chemicals
- Proper machine speed
- Using soft water

**▣ Pilling:****Causes:**

- Too high mechanical stresses on the surface of the fabric
- Excessive speed during processing
- Excessive foam formation in the dye bath

**Remedies:**

- By using of a suitable chemical lubricant
- By using anti foaming agent.

### 3.4 Sample Section:

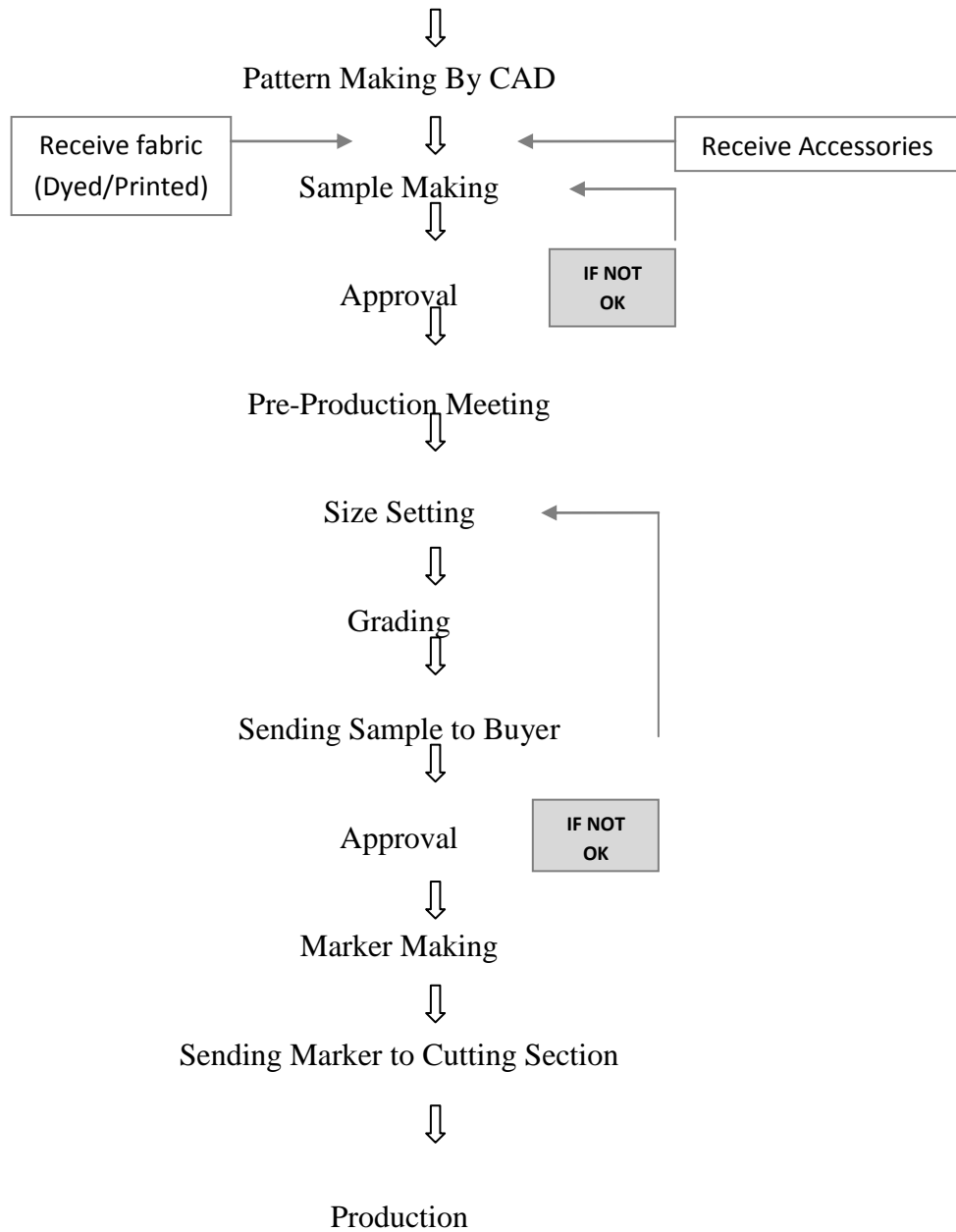
Sample is the prototype or model of the garments upon what buyer can decide on how and whether to confirm the order or not. It makes for buyer approval and before a bulk of production to minimize faults and errors and also find the easy process for bulk production.



**Fig: Sample Section**

### 3.4.1 Operational Flow Chart of Sample Department:

Receive Specification & Measurement sheet from buyer (via merchandiser)



### 3.4.2 Types of sample:

#### **First pattern (Fit/development sample):**

The first physical version of any garment as per the artwork done by designer and/or developer.

Purpose : To see the design work and test the fitting.

#### **Photo Sample:**

Samples are made with actual color and material to be worn by the models on the event of shooting for catalog.

#### **Salesman Sample:**

Buyers held a meeting with its customer and record their response on order quantity per color and size. Order quantity may changed after sales meeting.

Purpose : Sales meeting with retailers, market appraisal, order forecast

Material : Actual

Price : Confirmed

Quantity : Minimum 1 piece from each color

#### **Pre-production sample**

When all the items/material for bulk production arrived, factory makes a sample with the actual material and send it to buyer for approving the production.

#### **Photo Sample:**

Samples are made with actual color and material to be worn by the models on the event of SHOOTING for catalog.

### **Test Sample**

Test sample are sent to the testing lab to conduct the test on the sample.

### **Approval Sample:**

In any discrete period of time, whenever buyer revise any specification, a new sample is made (some time mock up is workable too) as per new specification. It is sent to the buyer for his approval to ensure that the revision is done correctly

### **Size Set:**

Consists one piece from each color and each size.

Purpose : To test fit of the garment in different size.

### **Mock up sample:**

Mock up means not a total garment, it's a fixed part of a garment. If any part contains fault, then buyers requires a fault free that parts to be confirmed that the supplier is capable and understood the requirement.

### **Pre-production sample**

When all the items/material for bulk production arrived, factory makes a sample with the actual material and send it to buyer for approving the production.

### **Production Sample:**

It is reference to the buyer that the bulk is being produced as per specification. Buyer want to be sure that the correct material is sourced and line workmanship conformed with the quality level All the above samples are made in sampling department. Buyer wants pre-production sample (PP sample) to be made in actual production line, so that operators know what they are going to make. This sample is made with actual fabric, trims and accessories and made by sewing line tailors.

### **Shipping Sample:**

A sample is sent to the buyer just after completion of final inspection so that the buyer may know what types of garments he is going to receive. It also helps the buyer to settle the customs procedure earlier. The supplier keeps one piece as well so that he may refer in case of any dispute/claim.

### 3.4.3 Types of Patterns:

- Working pattern
- Production pattern

- Working pattern: The pattern which is used to make sample garment that is called working or master pattern.
- Production pattern: The pattern which is used for bulk production that is called production pattern.

Pattern grading: After developing pattern, pattern master decreases or increases master pattern stepwise, it is called pattern grading. Like this-

S ↔ M ↔ L ↔ XL

### 3.4.4 Marker Making:

It can be done both manually & Computerized method.

Then actual marker is drawn by hand following that miniature marker.

- Marker is made by following steps-
  - Pattern are placed onto a large thin sheet
  - Then marked by pen around the pattern



→First place big part & small part are placed at the end position

→Finally found a marker

- Marker is made of fulfill the following objects:

→To get similarities among the apparel

→To save times

→To minimized fabric wastage

→To reduce cost

### 3.4.5 Marker Efficiency:

$$\text{Marker Efficiency} = \frac{\text{Area of pattern in marker}}{\text{Total area of the marker plan}} \times 100$$

During marker making the following points should be checked-

1. Pattern direction
2. Pattern alignment
3. Parts missing
4. Mismatched checks or stripes
5. Overlapping
6. Marker too width than fabric
7. Poor line marking
8. Double line marking
9. Pattern to pattern distance
10. Notches and drills marks are omitted

### 3.4.6 Sample Machine Status:

Machine Type	Machine quantity
1.plain machine	<b>11pcs</b>
2.plain machine for binding	<b>01pcs</b>
3.Flatlock for hem	<b>03pcs</b>
4.Flatlock for binding	<b>02pcs</b>
5.Over lock	<b>10pcs</b>
6.Kansai	<b>01pcs</b>
7.Hole	<b>01pcs</b>
8.Button	<b>01pcs</b>
9.Bertack	<b>01pcs</b>
Total	<b>31pcs</b>

### 3.4.7 Sample Manpower Status:

Designation	Manpower
1.Pattern master	<b>3</b>
2.Cutter Man	<b>3</b>
3.Sample Man	<b>17</b>
4.Iron Man	<b>2</b>
5.Quality	<b>3</b>
6.Operator	<b>3</b>
7.Supervisor	<b>2</b>
Total	<b>33</b>



**Fig: Sample Section**

### 3.5 Cutting Section:

#### 3.5.1 Cutting Flowchart:



#### 3.5.2 Machine in Cutting Section:

Name	Quantity	Brand
1.Plotter	02	Morgan
2.Auto Spreader	02	Morgan
3.Auto cutter	01	Morgan
4.Fusing Machine	01	Morgan
5.Hand Cutter	12	Morgan

### 3.5.3 Fabric Relaxation:

This process is optional. Specially used for knits fabric. During rolling of fabric it get stretched. So it is essential to bring the fabric on stable form otherwise garment would shrink after making. To relax the fabric roll or than is opened and spread and kept for about 24 hours. The relaxation time of different types of fabric are given below,

Fabric Type	Relaxation Time (hr)
1.s/j cotton (low gsm)	<b>24-36</b>
2.viscose	<b>24-36</b>
3. s/j lycra	<b>24</b>
4.Rib lycra	<b>24</b>
5.Pk	<b>18-24</b>
6.Interlock	<b>18-24</b>
7.s//j cotton	<b>10-12</b>
8.Rib cotton	<b>10-12</b>
9.Felece	<b>6-8</b>



Fig: Fabric Relax Area



Fig: Fabric Relax Area

### 3.5.4 Fabric spreading:

Fabric spreading means the smooth laying out of fabric with respect marker length and width which is specified.

When spreading is done the following basic requirements maintained-

1. Alignment of plies
2. Correct or uniform ply tension
3. Smooth surface of fabric
4. Static electricity free during spreading
5. Fusion free for synthetic fabric
6. Matching of stripe or check
7. Distortion free of plies

There are two methods are used for spreading-

1. Manual method
2. Mechanical method



Fig: Fabric Spreading

### 3.5.5 Methods of Spreading:

#### **Manual Method**

- By Hand
- By Hook
- Spreading Truck (with the help of operator)

#### **Mechanical Method**

- Semi-Automatic
- Full Automatic

### 3.5.6 Methods of Cutting:

Basically Cutting Methods are ,

#### ➤ Complete manual technique

M/C Used:

- Scissors

#### ➤ Manually Operated power knife

M/C Used:

- Scissors
- Straight knife
- Round knife
- Band knife
- Dia Cutter
- Notcher cutter
- Drill

#### ➤ Computerized technique

M/C Used:

- Computer controlled knife cutter (Combined with CAD & CAM)





Fig: Straight Knife Cutting machine



Fig: Auto Cutter Machine

### 3.5.7 Numbering:

Separated garment components are numbered to ensure that in stitching all components from same layer are stitched together. It is important to avoid shade variation in a garment. Between the cutting and sewing processes cut components may be passed through other processes like printing and embroidery.



### **3.5.8 Bundling**

As per the production line requirement a certain number of pieces with all components are tied together. This process is known as bundling. Each bundle is marked with bundle number, style name, size number and quantity of pieces in that bundle. At this stage cutting are ready to send to production line for stitching.

### **3.5.9 CAD:**

Cad department is a major part for a garments industry. In this department they create pattern or marker as per sample or buyer requirement.

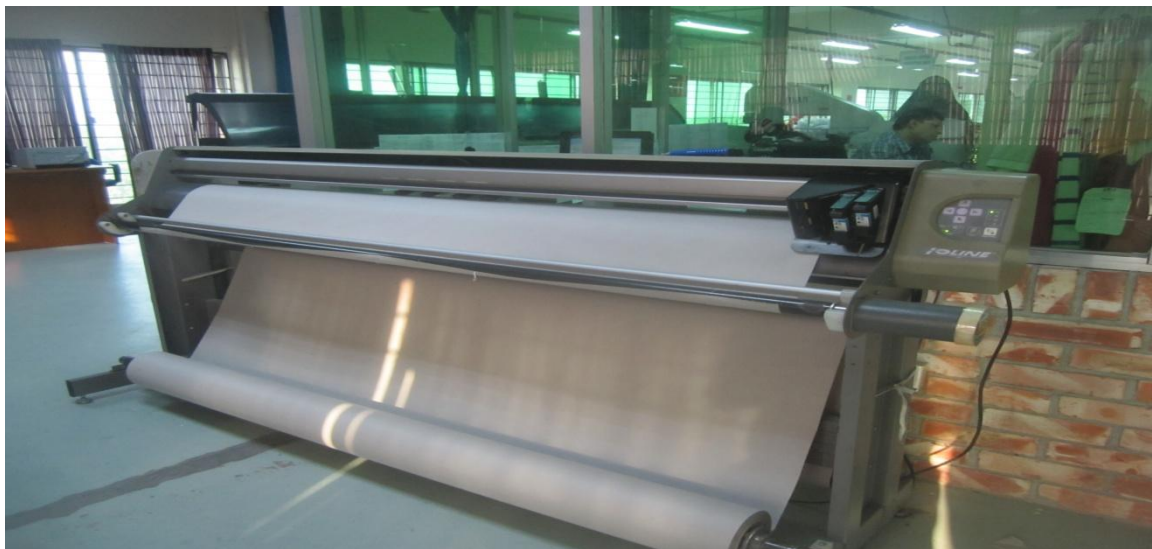


Fig: Plotter Machine



Fig: Quality Checking

### 3.6 Printing Section:



#### 3.6.1 Machine specification of printing section:

##### 1. Tacing m/c:

Brand Name	Qty	Use
Winson	2	Mash attach with frame with clip



Fig: Tacing m/c

**2. Expose M/c :**

Brand Name	Qty	Use
Winson	2	Film set on screen



Fg:Expose m/c

### 3. Automatic stone fixing machine:

Brand Name	Qty	Use
Winson	8	Stone attach with heat and pressure by nozzle



#### 4. Label Printing Machine:

Brand Name	Qty	Use
Shanghai	2	Label print



Fig: Label Printing Machine

#### 5. Auto Heat traces m/c:

Brand Name	Qty	Bad size	Temp.	Use
Shanghai	7	18 X14	150-400	To dry





Fig: Auto Heat traces m/c

### 3.6.2 Different types of printing:

1. Pigment printing
2. Rubber printing
3. Crack printing
4. Discharge printing
5. Plastic sol/ High-density printing
6. Flocking printing
7. Foil printing
8. Glitter printing
9. Emboss / Pub printing

### 3.6.3 Chemical used in Printing:

Thickener (PG): It is a main compound for making a paste.

Binder: Hold color on to the fabric surface.

Fixer: Cross linking chemical (when drying at high temperature about 150 °C) Printing section

Pigment: It is a coloring substance

### 3.6.4 Some printing Sequence:

#### ➤ Pigment printing

Recipe:

Thickener-----2%

Binder-----8%

Fixer-----2%

Water-----90%

Sequence:

Table preparation



Fabric plaited on the table



Pigment printing paste apply with the help of screen

▼  
Curing at 160°C (belt speed 6.50 m/min)

▼  
Delivery

### ➤ Rubber printing

Recipe:

Rubber-----60%

Clear-----38%

Fixer-----2%

Sequence:

Table preparation

▼  
Fabric plaited on the table

▼  
Rubber printing paste apply with the help of screen

▼  
Hanging the fabric for 30 min

▼  
Curing at 150°C (belt speed 5 m/min)

▼  
Delivery.

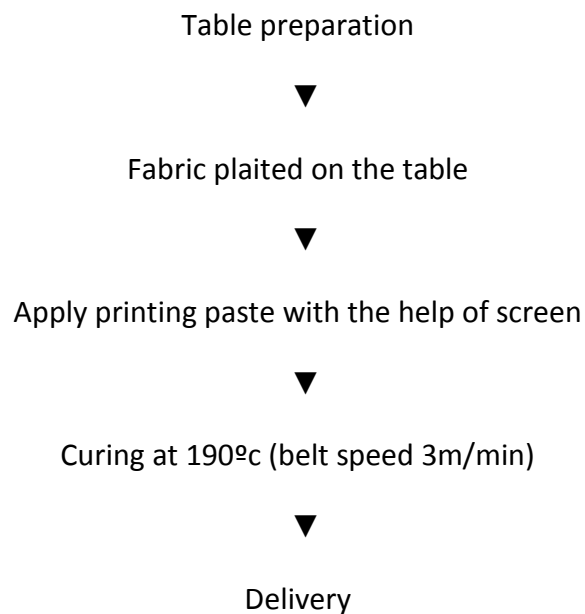
➤ Discharge printing

Recipe:

Discharge rubber paste----- 90%

Discharge/ RNS powder----- 49%

Sequence:



### 3.6.5 Faults in printing:

Fatting: If the pigment printed fabric is fatted (on printed portion) after washing. Then this fabric is rejected. So it is major fault for printing.

Cracking: If the rubber printed fabric is braking (on printing portion) after elastration.

### 3.7 Sewing Section:

Joining the fabric by the use of needle and thread is called Sewing. Sewing section is the biggest section in a garments industry. It is a universal and widely used method of joining fabric. The main purpose of sewing is to produce seam.

#### 3.7.1 Element of Sewing:

- 1.Sewing Thread.
- 2.Needle
- 3.Sewing Machine.

#### 3.7.2 M/C Name & Quantity:

Machine Type	Quantity	Brand
Lock Stitch plain m/c	560	Brother/juki
Over lock	440	Brother/juki
Flat lock	425	Brother/juki
Button hole	25	Brother/juki
Button stitch	31	Brother/juki
Vertical plain machine	10	Brother
Bar tacking	20	Brother
Single needle chain stitch	32	Kansai
Picotting	8	Kansai
Cover stitch(flat lock)	7	Kansai
PMD	11	Kansai
DFB	13	Kansai
Rib cutting machine	15	TOYO

### 3.7.3 M/C Description:

#### 1. Lock stitch machine:

- Most common machine for woven garments
- More secured sewing
- No of needle:1 or 2
- SPM:1500-5500



fig: LOCK STITCH M/C

- Stitch Density is variable, max. stitch length 5mm
- Different types of feed mechanism (Puller Feed, Top AND bottom Feed etc.)
- Automatic bobbin winder and thread trimmer present in some of the versions.

#### 2. Chain stitch machine:

Used for both Knit and Woven Garments, for both light and heavy fabrics

- No of Needle:1 or more
- SPM:2000-6000                      Stitch Length 1.5 mm – 4.5 mm

- Automatic Thread trimming in some machines



fig: Chain Stitch Sewing Machine



fig: Chain Stitch

### 3.Over lock machine:

- No of needle: One or more,
- No of Thread: 2-5 thread
- Maximum stitch length: 4 mm
- SPM: 6500-8500
- Edge Trimmer knife is adjustable in front of the needle
- Used for both woven and knit fabrics



Fig: over lock

fig: Over lock stitch

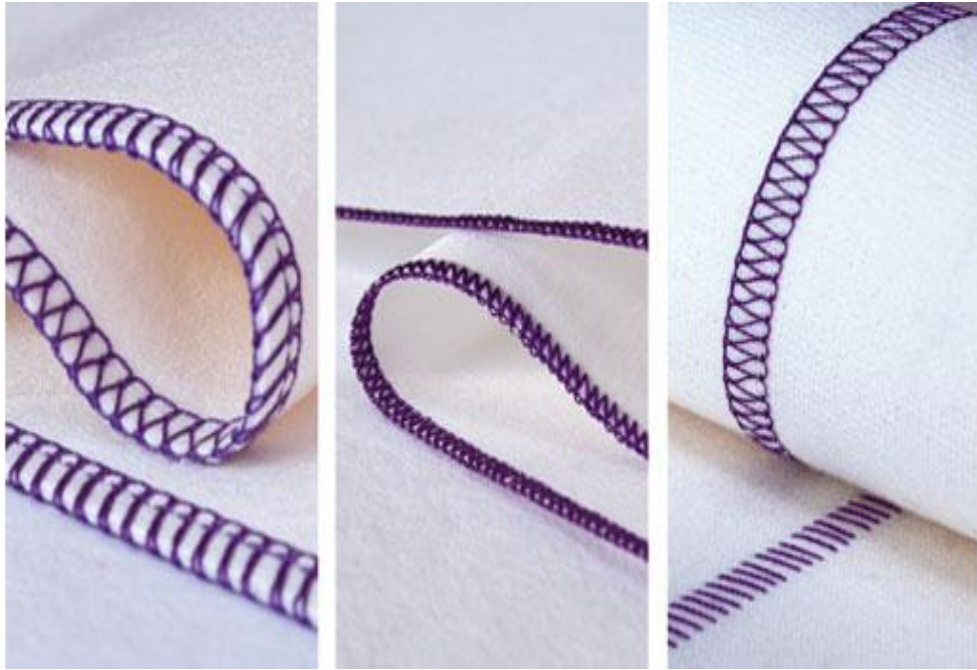


fig: Over lock stitch

#### 4. Zigzag Sewing Machine

- Special type of lock stitch machine
- No of needle is one, sewing is created by two sewing thread
- Stitch length:2-2.5 mm
- Used for producing Zig-Zag stitch
- SPM:2000



fig: Zigzag stitch



## 5. Flat Lock Machine:

- Up to four needle can be used
- Stitching can be done by using 4-9 threads
- Stitch density: 8-16 per inch
- SPM: 6000
- Thread consumption is high
- 1 inch sewing may require 32 inch thread
- Used for knitted garments, but may be used for woven as well



Fig: Flat Lock stitch machine

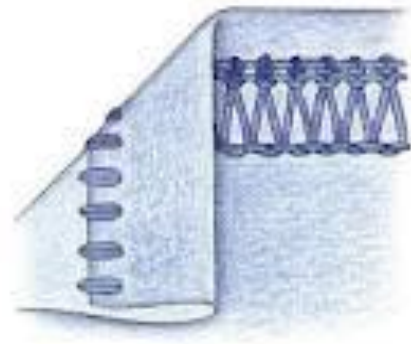


fig: Lock Stitch

## 6. Blind Stitch Machine

- Special type of sewing machine which is very expensive
- Stitches are not seen on the face side of the fabric
- Curved needle is used
- Penetration of the curved needle in the fabric is partial
- Stitch Length: 3-8 mm
- SPM: 2500
- Used in expensive garments and in the areas of hemming



Fig: Blind Stitch Machine

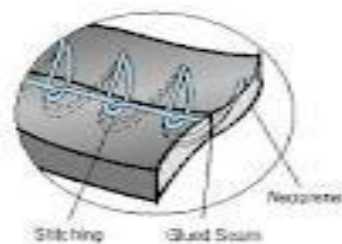


Fig: Blind Stitch

## 7. Button Hole Machine:

- Easy adjustment of hole size and stitch density
- For heavy fabric, hole is cut before sewing
- For lighter fabric, hole is cut after sewing
- Lock or chain stitch may be used
- Special type of thread are used



Fig: Button hole machine



fig: Button Hole

## 8. Button Attaching Machine

- Simple automatic machine
- Sewing in according to the hole in button and may be cross or parallel
- In some machines, Automatic feeding of the button
- Lock or chain stitch is used



Fig: Button Attaching Machine

## 9. Bar tack Machine

- It is used for heavy sewing in small predetermined length
- A Cyclic operation
- It is used where the garment in high pressure such as pocket corner, belt loop, etc



Fig: Bar tack machine



fig. Bar Tack Stitch

### 3.7.4 Needle size::

Needle size of different types for different fabric sewing is important. It is selected by two systems as follows \_

- Metric system: Needle Size= Blade dia in mm x 100  
=0.8mm x 100  
=80Nm
- Singer System: By a no. 5, 7, 9, 10, 11, 12, 14, 17, 14

### 3.7.5 To select needle following factors should be considered as follows:

- Needle size
- Total needle length Butt of needle eye length
- Shank dia

#### Sewing Needle

- ▶ A sewing needle is a long slender tool with a pointed tip.
- ▶ The needle must be able to penetrate the material being sewn, by pushing the yarns aside according to the application, without damaging it.
- ▶ The various parts of the needle are:

The shank, The shoulder, The blade, Long Groove, Short Groove, The eye, The point and the Tip.

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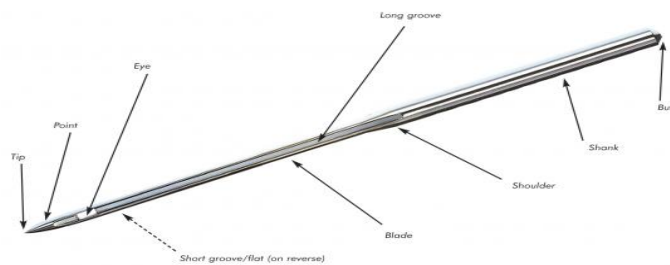


Fig. Sewing needle

#### Function of a sewing needle

- ▶ Making a hole through the fabrics without damaging the fabric
- ▶ After penetrating the needle with thread through the fabrics, make a loop of needle thread which will pick up by the hook of bobbin case
- ▶ Without lock stitch machine, passing the needle thread through the loop made by looper.

#### Different parts of a sewing machine needle

- ▶ **Butt:**

- The starting part of bottom edge of needle which can be made by predetermined shape
- It helps for the attaching of needle with the needle bar or clamp of the sewing machine

► **Shank:**

- Shank locates the needle in the needle bar. Shank is following types:
  - *Shanks with a circular section*
  - Shanks with a flat side which serves to locate the needle in a specific position in the needle bar Shank thickness is maintained all the way down to needle blade.
- Shank thickness is maintained all the way down to needle blade.
- It is wider than remaining parts of needle and works as a support of needle

► **Shoulder:**

- It joins the shank and blade of the needle
- When needle penetrates through the fabric to reach its lowest position, then the shoulder also penetrates through the fabric to make a wider hole in the fabric which reduces the friction between needle and fabric.

► **Blade:**

- Blade of needle runs from the end of shoulder to the beginning of the eye.
- Blade increases in thickness from eye to shoulder to increase stiffness.
- Curved blade needles are used for Blind stitch machines.
- It is the longest part of the needle

► **Long Groove:**

- It is long and thin groove in blade from shoulder to needle eye
- Groove is the threading side of needle.
- Its function is to guide the thread while forming the stitch and to protect it against excessive friction
- During up and down of needle through the fabric during sewing, the sewing thread take place in this groove and thus reduce friction between fabric, needle and sewing thread.

► **Short Groove:**

- It is a small groove between needle eye and tip
- It helps the sewing thread to create loop.

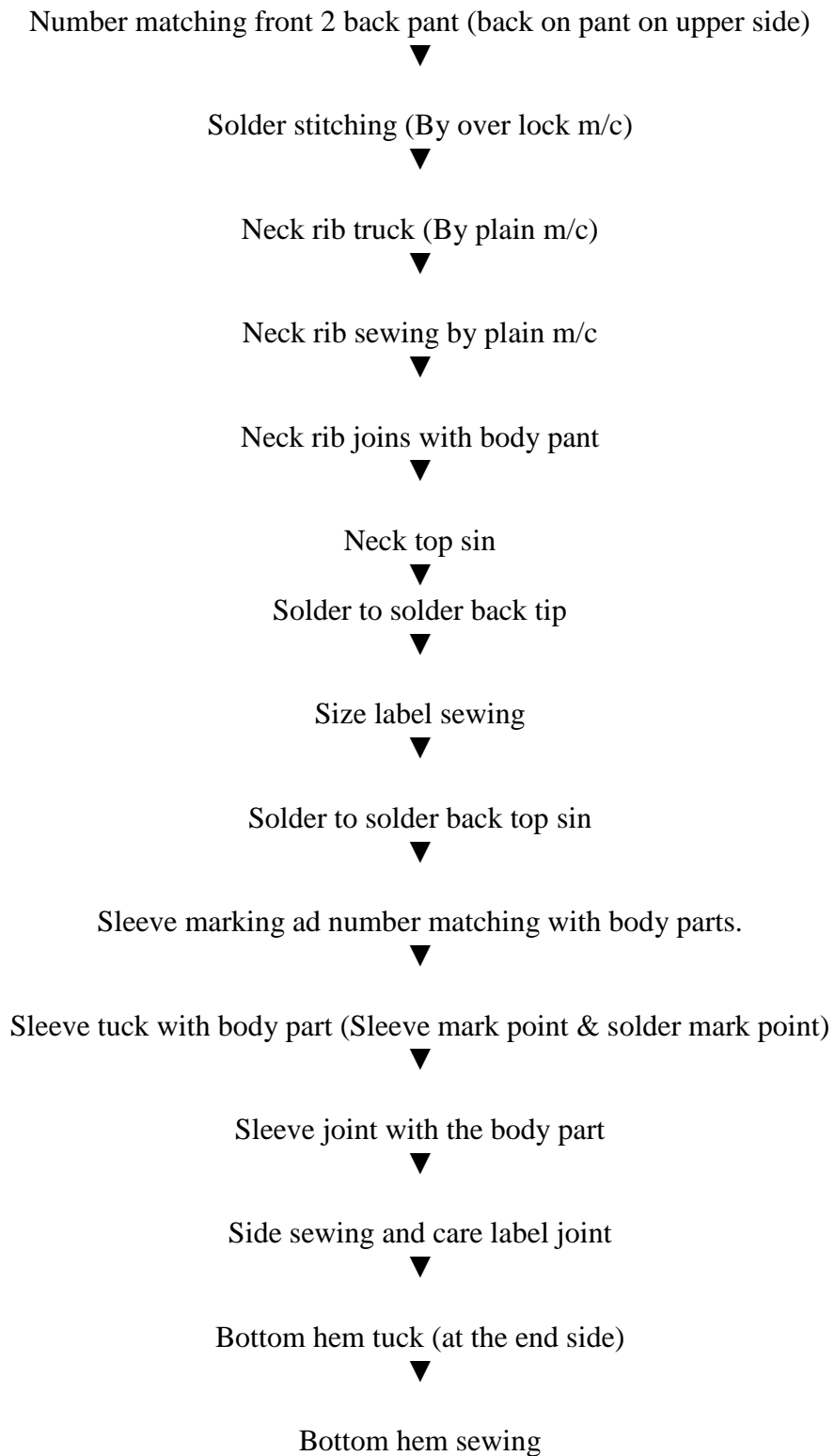
- It is placed in the side of needle in which side the hook or looper is placed.
- ▶ **Needle Eye:**
  - **Eye** is the hole before needle point for sewing thread.
  - It is a small slot between short and long groove of the needle
  - The shape of eye is always extended in its length as the needle thread has to pass diagonally through the needle in the length direction
  - The inside of needle eye is most important as it could damage the sewing thread.
- ▶ **Scarf:**
  - It is curved slot at near above the eye
  - It helps to close setting between the needle and the looper so that looper or hook can catch the needle loop.
- ▶ **Point:**
  - It is the part from the needle eye to the tip
  - It helps to penetrate the needle into fabric without any damage, so selection of point is important
- ▶ **Tip:**
  - The bottom end of a sewing thread is called tip.
  - Its function is to penetrate the needle into fabric without any damage
  - It helps to create hole in the fabric during sewing

➤ **Different types of sewing needle**





### 3.7.6 Sewing sequence of T-shirt:



▼  
Arm bottom hem joint

▼  
Inspection.

### **3.7.7 Sewing sequence of Polo shirt:**

Lining joint with collar part by heat pressing

▼  
Collar marking for open stitch

▼  
Collar inside open stitch

▼  
Collar marking

▼  
Collar ¼ top sin

▼  
Collar cutting

▼  
Band Rolling

▼  
Band joint with Collar

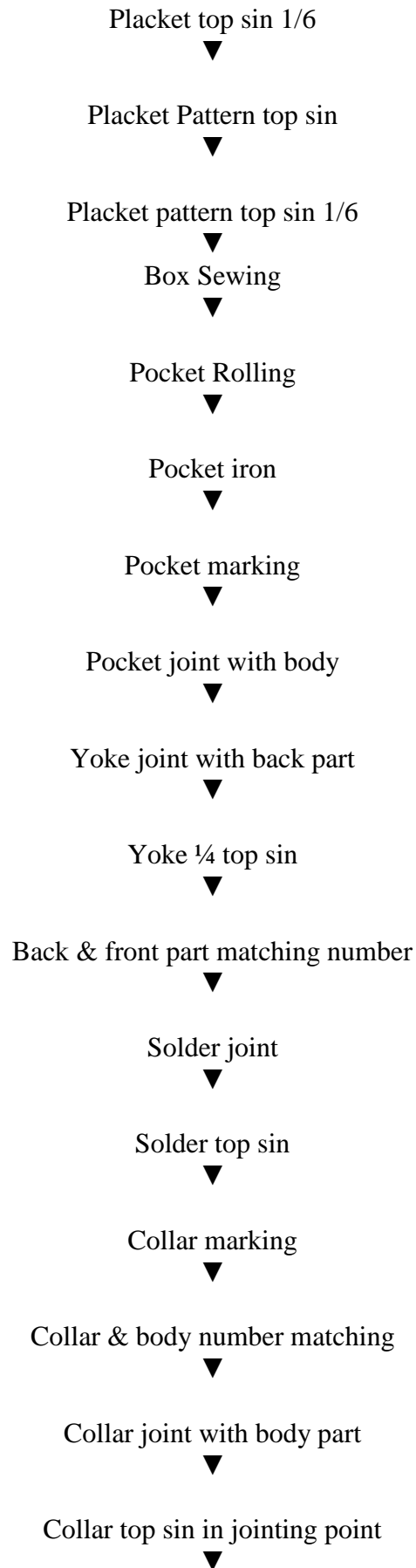
▼  
Band top sin 1/6

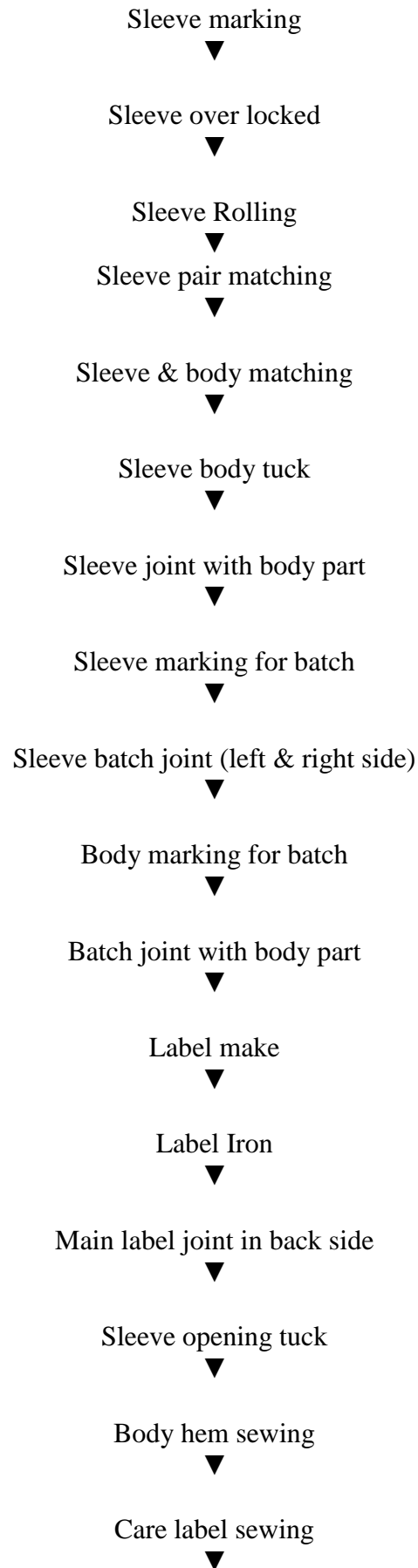
▼  
Placket lining

▼  
Placket marking

▼  
Placket Rolling

▼  
Placket joint





Side join



Band tuck



Band tape joint



Band top sin



Sleeve chap tuck



Inspection.

### 3.8 Finishing Section:

At this stage products goes through various stages like removal of loose thread, fold-ing etc & hanged with hanger & poly bag. Garments finishing section is equipped with steam press with vacuum table. The other finishing machineries are needle detector, thread blowing, strain removing, carton box striping etc.






#### 3.8.1 Process Flow Chart of Garment Finishing:



### 3.8.2 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.

### 3.8.3 Ironing Symbols:

Care Symbol	Written Care Instructions	What Care Symbol and Instructions Mean
	Iron, Any Temperature, Steam or Dry	Regular ironing may be needed and may be performed at any available temperature with or without steam is acceptable.
	Iron, Low	Regular ironing, steam or dry, may be performed at Low setting (110C, 230F) only.
	Iron, Medium	Regular ironing, steam or dry, may be performed at Medium setting (150C, 300F).
	Iron, High	Regular ironing, steam or dry, may be performed at High setting (200C, 290F).
	Do Not Steam	Steam ironing will harm garment, but regular dry ironing at indicated temperature setting is acceptable.

	Do Not Iron	Item may not be smoothed or finished with an iron.
---	-------------	--



**Fig: Ironing**

### **3.8.4 Measuring:**

Body measurements are of vital importance for obtaining best results in cloth construction. Besides good fitting, correct measurements can also contribute towards



saving time in constructing a garment. Personal measurements are required not only for stitching the garment at home or getting it stitched, but also for buying ready made garments.

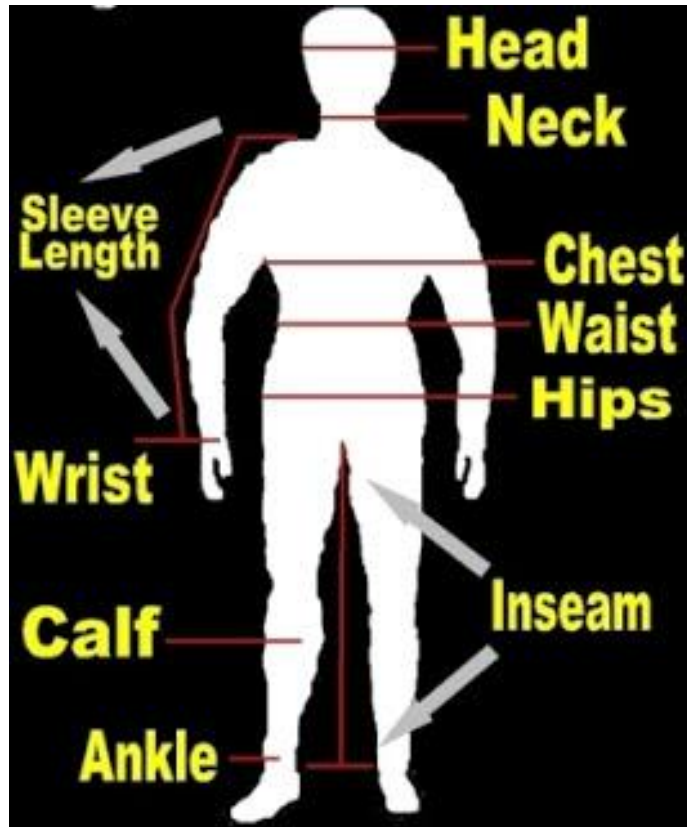



Fig: Body Measurement

Taking body measurements is a responsible task, which should be undertaken with great care. For this purpose, it is important for a dress maker to have adequate knowledge about correct methods of taking and recording body measurements, equipment required for it and other important points to be considered in taking the measurements.

**An example of a long sweat shirt,**

	Product:11930125	Season: 130	Dept:11.9	Supplier: (A)647367/ <b>Graphics Textiles Ltd.(BANGLADESH)</b>
---	------------------	----------------	-----------	---

	Description: <b>Long sweatshirt with round neck</b>	FFP:01-cs bp + ss office	Brand: <b>Johns baner JEANSWEAR</b>	
	Items: <b>951057,959481,974844</b>		Date: <b>22/10/14</b>	
Measurements				

Common		+/-	32/34		40/42		36/38		44/46		48/50	
			Buyer req.		Buyer req.		Buyer req.		Buyer req.		Buyer req.	
A	½ bust width 2 cm below armhole	1	46	+5	50	0	54	-25	60	+5	66	0
B	½ waist width	1	44	+5	48	-5	52	+5	58	+5	64	-5
D	½ width of hem	1	46	0	50	-25	54	-5	60	0	66	-25
ESL	Breadth of shoulder and length of sleeve	1	71.5	0	72	+5	72.5	+5	73	0	73.5	+5
G	½ width of upper sleeve , msrd 2cm below armhole	0.5	16	-5	17	+7.5	18	0	19.5	-5	21	+7.5
GA	½ width of sleeve hem, long	0.5	8.5	0	9	-25	9.5	0	10	-25	10.5	-25
GHS	Height of sleeve hem	0	4	0	4	0	4	0	4	0	4	0
J	Neck diameter(seam to seam)	0.5	25	+5	26	-5	26	0	27	-5	27	-5
JHF	Height of neck facing	0	1.2	0	1.2	0	1.2	0	1.2	0	1.2	0
JMF	Front neck drop	0.5	11.5	-5	12	0	12.5	+5	13	0	13.5	0
JNB	Back neck drop	0.5	4	0	4	0	4	0	4	0	4.5	0
LHW	Height of tubular at hem	0	4	0	4	0	4	-25	4	0	4	-5
PS	Full length from HPS measured at back	2	74	+1.5	76	+1	76	+1	78	0	80	-5
VA4	Pocket position from hem	0.5	7	-25	7	0	7	0	7	+25	7	0
VB	Breath of pocket	0.5	16	+5	16	+5	17	+5	17	+5	18	+5

VO	Length of pocketing opening	0.5	13	-.25	13	0	14	+.25	14	0	15	0
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## 9.4 Packing:

Packing is one of the most important parts of apparel manufacturing process. After completing the entire manufacturing task, apparel is required to pack. In finishing section, packing is the last steps before storing. Various types of packing are done and it depends on the type of apparel. After packing, it placed in cartoon as per instruction. After cartooning, carton is stored in store section. The carton is delivered from the store for export.

Different types of packing are done in finishing section. Following is the most used packing types –

1. Stand up pack: Shirt (900 angle)
2. Flat pack: Sport wear/Shirt/Trouser
3. Hanger pack: Blazer, Coats, Pants
4. Semi stand up pack: Shirt
5. Half fold pack: Pant

### 3.8.5 Types of Carton Packing:

After packing, cartooning is done according to apparel size and color. Most used packing types are given below:

1. Solid color Solid size pack
2. Solid color Assorted size pack
3. Assorted color Solid size pack
4. Assort color Assort size pack

### **3.8.6 Metal Detection m/c:**

Metal detection is now an integral part of the textile and apparel production process. Product protection is now an essential quality assurance requirement for manufacturers supplying leading brand names and retail outlets across the world. The use of metal detection equipment during the production stage ensures that all products are safe and free from metal contaminants. This is a vitally important consideration for manufacturers, as bad publicity, legal action and financial losses could result if a customer was injured by a broken needle tip or other ferrous contaminant left in the finished product during the manufacturing process. Lock Inspection has invested considerable time and energy researching this area of the metal detection, and has used the knowledge gained to enhance the performance and reliability of metal detection equipment. Lock Inspection now offers the Needlechek metal detector which utilises leading edge technology to guarantee the very highest standards of inspection, and deliver key benefits at every stage of production.

The Needlechek detector is the industry leading system specifically designed to enable the detection of broken needle tips or other ferrous contaminants during garment production. The Needlechek detector provides a quality assurance solution for all products which contain non-ferrous metal accessories, for instance zips, studs and rivets. Needlechek's exceptional sensitivity guarantees that ferrous contaminants to the equivalent of 1.2mm diameter will be detected at any point within the metal detector aperture. Needlechek can detect the presence of ferrous contaminants in products containing brass, tin, copper, aluminium and every other metal used and approved by leading textile accessory manufacturers such as YKK, Prym, and Opti.



Fig: Metal Detector Machine

### **3.8.7 INSPECTION:**

#### **✓ Definition:**

A statistical measurement of the maximum number of defective goods considered acceptable in a particular sample size.

#### **✓ 9.7.2 Types of defects considered in AQL :**

- **Critical Defects:** are those that render the product unsafe or hazardous for the end user or that contravene mandatory regulations.
- **Major defects:** can result in the product's failure, reducing marketability, usability.
- **Minor Defects:** do not affect products marketability or usability but represents workmanship defects that make the product fall short of defined quality standard.

✓ **9.7.3 AQL Chart:**

Footwear Industry Standard Final Inspection Sampling Plan ( Normal)*								
Lot Size or Quantity Audited	Acceptable Quality Level (AQL) Level							
	1.5		2.5		4		6.5	
	Inspect	Accept	Inspect	Accept	Inspect	Accept	Inspect	Accept
Less than 150	20	1	20	1	20	2	20	3
151 – 280	32	1	32	2	32	3	32	5
281 – 500	50	2	50	3	50	5	50	7
501 – 1,200	80	3	80	5	80	7	80	10
1,201 – 3,200	125	5	125	7	125	10	125	14
3,201 – 10,000	200	7	200	10	200	14	200	21
10,001 – 35,000	315	10	315	14	315	21	315	21
35,001 – 150,000	500	14	500	21	500	21	500	21
150,001 – 500,000	800	21	800	21	800	21	800	21
500,001 & Over	1250	21	1250	21	1250	21	1250	21

**PRE FINAL INSPECTION REPORT**

Lot No.	30	Inspection Date	14-10-14
Factory	<b>GRAPHICS TEXTILE LTD.</b>	Inspection Time	3:10 PM
Customer	BONPRIX	GTL	4345
Order No.	123241	Style No.	14322679
Order quantity.	1500	Colour	Lime
Ship quantity.	1542	Article No.	948250

Carton No.	01-53			Season			131	
Size	32/34	36/38	40/42	44/46	48/50	52/54		
Pieces	145	329	384	360	198	126		
Random Check	5	11	12	12	6	4		
<b>Inspection Schedule</b>	<b>Faults Found</b>		<b>Comments</b>					
Formal Mistake								
Comparison of Sample, Fabric, Colour, CD Chart, Accessory Card	01		Dirty spot -01					
Appearance, Execution, Workmanship	01		Skip Stitch -01					
Measurement deviation								
<b>TOTAL=</b>	02		<b>Inspection Result</b>			passed	✓	reject
Inspector Name:								
Signature:								
<b><u>Importance</u></b>								
1. Order must be 100% packed for inspection								
2. Minimum 2 pcs per size to be checked								
3. Even only one carton is oversize or over packed the whole order rejected								
4. Inspection standard AQL 4.0/1/Normal								
5. Inspection standard AQL 4.0/1/Tightened								
Order Quantity	51-90	91-150	151-281	281-500	501-1200	1201-3200	3201-10000	10001-30000
Random check pieces	5	8	13	20	32	50	80	125

Fault accepted(normal)	0	1	1	2	3	5	7	10
Rejected	1	2	2	3	4	6	8	11
Fault accepted (Tightened)	0	1	1	1	2	3	5	8
Rejected	1	2	2	2	3	4	6	9

Pre-final inspection is done by AQL (Acceptable Quality Level) system.

The report shows that order quantity 1500 pcs.so according to AQL system,50 pcs of garments should be inspected. Generally the system is seen tightly. So, If the fault is more than three, the order should be rejected.

Here, two fault have found, these are,

1. Dirty spot.
2. skip stitch.

According to AQL system the order is accepted.



### 3.9 WTP and ETP:

#### 3.9.1 Water

Pump pressure ranges from 0-10 bar. Water is stored in the water treatment plant. The water is collected from the 120 ft. below to the earth. In this region, the water is not so hard enough that can cause create problems in dyeing & other sections. This water is treated with resins mainly.



**Fig: Water supply pump**

#### 3.9.2 Water Treatment Plant (WTP)

Water for a textile plant may come from various sources. But this water cannot be used directly in textile processing because it contains various salts. These salts are mainly the carbonates ( $\text{CO}_3^{2-}$ ), Hydrogen carbonates or bi-carbonates Sulphates ( $\text{SO}_4^{2-}$ ) and Chlorides (Cl) of Calcium ( $\text{Ca}^{2+}$ ), and Magnesium ( $\text{Mg}^{2+}$ ). These are called hardness in the water. These must be removed though water treatment plant.

#### 3.9.3 Effluent Treatment Plant (ETP)

The effluent generated from different sections of a textile industry must be treated before they are discharged to the environment. Various chemicals and physical means are introduced for this purpose.

Capacity : 90m<sup>3</sup>/hr

### **3.9.4 Required Chemical of Biological E T P:**

#### **H<sub>2</sub>SO<sub>4</sub>:**

Function: Neutralize the waste water controlling the PH. It is auto dispensed in the neutralization tank.

#### **Polyelectrolyte:**

Function: Used for sedimentation / sludge coagulation and also killing bacteria.

#### **Antifoaming Agent:**

Function: Used for reduction / controlling foam. It is used auto / manually in the distribution tank.

#### **De-colorant:**

Function: Used for removing color. It is used auto / manually in the sedimentation feeding tank.

#### **Sodium Hypochlorite:**

Function: It is used to kill the harmful bacteria. It is used in the biological oxidation tank

*CHAPTER-4*

**IMPACT OF INTERNSHIP**

## **1. Knitting Section**

- I. Understood how knit fabric is produced
- II. Learned about machine description
- III. Observed various knitting fault
- IV. Knowledge about various types of fabric

## **2. Batch Section**

- I. Learned about different batch size
- II. Learned about fabric fault identification

## **3. Lab Dip Section**

- I. Understood about calculate the recipe for sample dyeing
- II. Learned to compare dyed sample with swatch by light box

## **4. Dyeing Section**

- I. Understood dyestuff evaluation
- II. Learned about color matching together with process and product development
- III. Learned the process of mixing different dyes

## **5. Finishing Section**

- I. Learned about different type of finishing m/c
- II. Understood how GSM is controlled
- III. Learned to improve the feel of the fabric by softening, stiffening etc

## **6. Garments Section**

- I. Observed how skilled workers work in sample section
- II. Learned the process of preparing a pattern for an individual size & design
- III. Cleared the conception about different types of sample required to produce a garment
- IV. Learned about the digitizing board in CAD room
- V. Learned about different type of cutting machines (i.e. Straight knife cutting machine, Round knife cutting machine, Band knife cutting machine etc.)
- VI. Learned the process of fabric spreading

- VII. Observed the process of fabric cutting according to the marker
- VIII. Understood different process of fabric lay
- IX. Understood how numbering and bundling is done

## **7. Printing Section**

- I. Learned about screen or print paste preparation
- II. Cleared the conception about different type of printing method
- III. Learned about different types of printing machine

## **8. Sewing Section**

- I. Learned about different type of machines used in a sewing floor (i.e. Single or double needle lock stitch machine , Multi needle chain stitch machine, Over lock machine, Feed of the arm machine etc.)
- II. Cleared the conception about production of a sewing floor ( line by line and total floor)
- III. Observed and realized the importance of final inspection at the end of every sewing line
- IV. Got experienced in making production study of an operator for an individual process for a definite time interval

## **9. Apparel Finishing Section**

- I. Observed various type of finishing process after sewing
- II. Observed different type of machines used in finishing section (i.e. Neck press machine, Metal detector machine etc.)
- III. Learned about different type of iron machines
- IV. Learned about various type of accessories used to attach to the garment (i.e. Security alarm, Hang tag, Price tag, Barcode label etc.)
- V. Observed the application of different chemicals for the removal of various type of stain
- VI. Cleared the conception about different packing type and packing ratio
- VII. Understood the basic difference between gross weight and net weight

## **10. Merchandising Section**

- I. Cleared concept about marketing
- II. Learned how to costing and consumption is done
- III. Understood how to receive order and shipment
- IV. Learned about details accessories and packing

## **11. WTP and ETP Section**

- I. Learned how waste water goes to the equalization tank
- II. Learned about to control pH and water hardness
- III. Observed only biological chemical is used

## **12. Utility Section**

- I. Understood the source of electricity and gas
- II. Got experience about gas generator and boiler
- III. Learned about different type of air compressor

## **13. Maintenance Section**

- I. Got experience about the factory Plants, equipments, Machine tools in an optimum working condition.
- II. Learned about different type of air compressor
- III. Understood the Production cycle within the stipulated range.

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*CHAPTER-5*

**Conclusion**

## 5.Conclusion:

I have completed my Industrial Training successfully by the grace of Allah. Industrial Attachment sends me to the expected destiny of practical life. **Graphics Textiles Ltd** is a well know factory in the Textile field of Bangladesh. The completion of the two months industrial attachment at this industry gave us the inspiration that factory is one of the appropriate destiny to implement the theoretical knowledge. From this industrial attachment i got the details idea about the factory environment, production process, total management, store & inventory process, maintenance, utility etc.

**Graphics Textiles Ltd** is well equipped and the working environment is excellent. The relation between top management to bottom level is so nice. The factory runs by a number of efficient Textile Engineers, Skilled technical & non-technical persons. All the Textile Engineers, technical & non-technical persons are very sincere, co-operative and helpful.

I wish good luck of them and also for this factory.