



**Faculty of Engineering  
Department of Textile Engineering**

**REPORT ON  
Industrial Attachment  
At  
Montex Fabrics Ltd.(Mondol Group)  
Nayapara, Kashimpur, Gazipur.**

**Course Title: Industrial Attachment  
Course Code: TE-418**

**Submitted By:**

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

**Advance in Apparel Manufacturing Technology**

**Duration: From September 10, 2014 to November 09, 2014.**

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## **DECLARATION**

I hereby declare that, this report has been done by my under the supervisor of **Md. Mominur Rahman Senior Lecturer of TE** Daffodil International University. I also declare that neither this report nor any part of this report has been submitted elsewhere for award of any degree.

**Submitted by:**

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## **ACKNOWLEDGEMENT**

At first my gratefulness goes to Almighty Allah to give my strength and ability to complete the industrial training and this report. I have made my life more bountiful. May your name be exalted, honored and glorified.

Now I wish to take this excellent opportunity to thank a lot of people who have assisted and inspired me in the completion of our training period.

Mr. Md. Mominur Rahman my supervisor, to whom I am extremely indebted for his tremendous support and guidance throughout my training period. Being working with him I have not only earned valuable knowledge but was also inspired by his innovativeness which helped enrich my experience to a greater extent. His ideas and way of working was truly remarkable.

I would like to thank the management of the Montex Fabrics Ltd. for giving me the opportunity to do the industrial training successfully and also their valuable suggestions. My deepest appreciation goes to Mr. Raja, Deputy General Manager, Montex Fabrics Ltd. for his permission to conduct my industrial training without which it would be uncompleted. The generous support is greatly appreciated. I would also like to thank Montex Fabrics Ltd. for helping me to complete industrial training successfully. My gratitude also goes to all the employees of Montex Fabrics Ltd. for their sincere co-operation, support and valuable advices.

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## **1. EXECUTIVE SUMMARY**

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

Textile education can't be completed without industrial training. Because this industrial training minimizes the gap between theoretical and practical knowledge and make us accustomed to industrial environment. I got an opportunity to complete two-months long industrial training at Montex Fabrics Ltd, which is a 100% export-oriented composite Knit Dyeing Industry. It has well planned & equipped fabric dyeing-finishing and garments units in addition to facilitate knitting and knitwear manufacturing

## **2. INFORMATION ABOUT FACTORY**

## 2.1 Company Profile

**Name** : Montex Knit Composite Ltd.  
**Type** : 100% Export Oriented Knit Composite  
**Industry**  
**Year of establishment** : 1991  
**Investor** : Mr. Haji Abdul Majid Mondol  
**Location** : **Nayapara, Kashimpur, Gazipur.**  
**Project cost** : Over Tk 200, 00,000,000  
**Annual turnover** : Tk 10,00,00,000 to 12,00,00,000  
**Production capacity** : 6.61 million Pcs./Month  
**Total Manpower** : 30000 Persons  
**Main Production** : Basic T-Shirt, Tank top, Long Sleeve, T-Shirt,

Polo Shirt, Shorts, Pajama, Set, Ladies, Vest  
Rugby shirt, Hood jacket, Trouser, Girls  
fancy, Long Pant, Night Gown, Kids  
Knitwear & all kinds of knit garments &  
knit fabrics.

**Fax Number** : 9289113

**E-mail** : [momin@mondol.net](mailto:momin@mondol.net)

**URL** : <http://www.mondol.net>

**Certification** : WRAP Certificate, BSCI Certificate.

<b>Bank</b>	<b>Limit (in million)</b>
<b>PRIME BANK LTD.</b>	= USD \$ 15.00
MOTIJHEEL C/A, DHAKA-1000, BANGLADESH.	

**JANATA BANK** = USD \$ 20.00

LOCAL OFFICE

MOTIJHEEL C/A, DHAKA-1000,  
BANGLADESH.

**UCBL** = USD \$ 05.00

32L GULSHAN NORTH C/A,  
DHAKA, BANGLADESH.

## 2.2 Name of the Unit

### 1. MONDOL FABRICS LTD.(Knit Composite)

Nayapara, Kashimpur, Gazipur, Bangladesh.  
Space-1,44,289 SQFT, Establishment-2004.

### 2. MONDOL TEXTILE LTD.(knitting & Knit Wears)

Nayapara, Kashimpur, Gazipur, Bangladesh.  
Space-27,000 SQFT. Establishment-1996.

### 3. MONTEX FABRICS LTD.(Knit Composite)

Nayapara, Kashimpur, Gazipur, Bangladesh.  
Space-66,667 SQFT. Establishment-1999.

### 4. MONDOL YARN DYEING LTD.

Nayapara, Kashimpur, Gazipur, Bangladesh.  
Space-20,000 SQFT. Establishment-2004.

### 5. MARK SWEATER LTD.(Sweater)

Nayapara, Kashimpur, Gazipur, Bangladesh.  
Space-52,640 SQFT. Establishment-2001

### 6. MONDOL KNIT WEARS LTD.(Knitting)

Surabari, Kashimpur, Gazipur, Bangladesh.  
Space-2,01,600 SQFT. Establishment-2006.

### 7. ALIM KNIT (BD) LTD.

Nayapara, Kashimpur, Gazipur, Bangladesh.  
Space-1,30,000 SQFT. Establishment-2006.

### 11. COTTON CLUB(BD) LTD.(Knit Composite)

South  
Jorun, Kashimpur, Gazipur, Bangladesh.  
Space-1,60,800 SQFT. Establishment-2004.

### 12. COTTON CLOUT(BD) LTD.(Knitting & Knit Wears)

South  
Jorun, Kashimpur, Gazipur, Bangladesh.  
Space-53,000 SQFT. Establishment-2008.

### 13. COTTON CONCERN(BD) LTD.(Knitting & Knit Wears)

Plot No.14, Block-C, Avenue-2, Section-12,  
Mirpur, Dhaka-1221, Bangladesh.  
Space-20,000 SQFT, Establishment-2001.

### 14. APPOLLO FASHION LTD.(Knitting & Knit Wears)

Plot No. I 5/2, Road-7, Section-7,  
Mirpur, Dhaka-1213, Bangladesh.  
Space-19,000 SQFT, Establishment-1999.

### 15. MONDOL TEXTILE LTD. UNIT-2(Knitting & Knit Wears)

Sirir Chala, Bagher  
Bazar, Gazipur, Bangladesh.  
Space-26,727 SQFT. Establishment-1998.

### 16. MONDOL FASHION LTD.(Knitting)

Zirabo, Ashulia, Savar, Bangladesh.  
Space-21,800 SQFT. Establishment-2006.

### 17. MONDOL KNIT COMPOSITE LTD.(Under Construction)

Kabirpur, Shimulia, Savar, Bangladesh.

**8. MONTRIMS LTD.(Total Solution of RMG Accessories)**

Mouchak, Kaliakoir, Gazipur, Bangladesh.  
Space-2,66,400 SQFT. Establishment-2004.

**9. COTTON FIELD(BD) LTD.(Knitting & Knit Wears)**

Shima Complex, Plot No.23, Shataish Road, Gazipur,Tongi,Bangladesh.  
Space-80,000 SQFT. Establishment-2004.

**10.MONDOL APPARELS LTD. (Knitting & Knit Wears)**

Parijat(Horinachala) 3rd & 4th Floor, Konabari, Gazipur,Bangladesh.  
Space-21,000 SQFT, Establishment-2008.

**18. Titan Fabrics Ltd.(Knitting)**

Jirabo,Savar,Bangladesh.  
Space-21,600 SQFT. Establishment-2008.

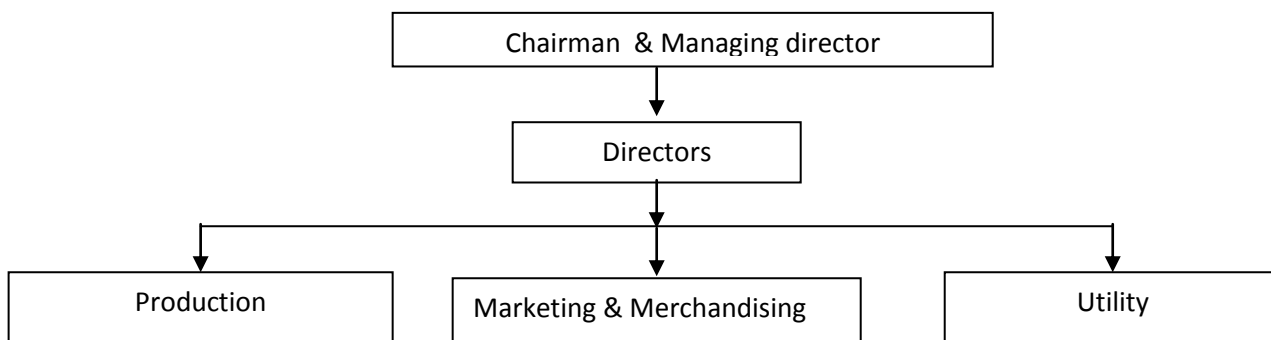
**19. MONDOL SECURITIES LTD.**

House No.8,(1st Floor), Sonargaon Janapath Road, Sector No.11,Uttara,Dhaka-1330,Bangladesh.

**Manpower of Mondol Group :**

**21,130 Nos. of Employee.**

**2.3 Upper Level Organizational Structure**



**2.4 Management Organogram**

Sl. No.	Marketing	Commer cial	A/C & store	Production Dyeing	Production Knit	Quality	Maintenance	Administration
01				MD				
02				ED				
03	AGM	AGM	AGM	AGM (Factory)		AGM	AGM	
04	Manager	Manager	Manager	Manager (Dyeing)	Manager (Knit)	Manager	Manager	<b>Manager (Admin)</b>
05	Assist manager	Assist manager	Cost Account	Assistant Manager	Assistant Manager	Assistant Manager	Electrical Engineer	<b>Administration Officer</b>

06	Sr. Executive	Sr. Executive	Sr. Executive	Sr. Prod. Engineer	Sr. Prod. Officer	QC officer	Mechanical Engineer	<b>Sr. Executive Admin</b>
07	Executive	Executive	Executive	Production Engineer	Asst. Production Engineer	Assistant QC Officer	Sub. Assistant Engineer	<b>Executive Admin</b>
08	Jr. Executive	Jr. Executive	Jr. Executive	Asst. Prod. Officer	Shift In-charge	QC In-charge	Forman	<b>Asst. Officer Admin</b>
09	Assistant	Assistant	Accounts Assistant	Lab. Chemist	Production Clark	Sr. QC Supervisor	Supervisor	<b>Security Officer</b>
10			Cashier	Sr. Lab. Assistant	Sr. Supervisor	QC Supervisor	Assistant Supervisor	<b>Computer Operator</b>
11			Purchase officer	Lab. Assistant	Supervisor	Assistant QC Supervisor	Sr. Fitter	<b>Office Assistant</b>
12			Sr. Store officer	Report Clerk	Assistant Supervisor	QC	Fitter	<b>Assistant Time Keeper</b>
13			Store officer	Batch In charge	Tr. Supervisor	Assistant QC	Assistant Fitter	<b>Typist</b>
14			Asst. Store Officer	Finish Incharge	Fitter	Tr. QC	Electrician	<b>Telephone Operator</b>
16			Store Keeper	Sr. Supervisor	Operator	QC Man	Boiler Operator	<b>Peon</b>
17			Asst Store Keeper	Supervisor	Assistant Operator		Boiler Assistant	<b>Driver</b>
18			Store Assistant	Assistant Supervisor	Tr. Operator		Generator Operator	<b>Gardener</b>
19			Helper Store	Tr. Supervisor	Tr. Assistant Operator		Compressor Operator	<b>Loader</b>
20				Tr. Asst. Supervisor	Helper		Asst. Operator	<b>Cleaner</b>
21				Sr. Operator			W.T.P. Attendant	<b>Painter</b>
22				Operator			Tr. Operator	<b>Sweeper</b>
23				<b>Asst. Operator</b>			<b>Helper</b>	

## **2.5 History of the Project Development**

After successful operation in Montex Knit Composite Limited, the owner had decided to start a fully information & technology based along with the social accountability and quality controlled modern ready made composite knit garments industry in large scale. In this connection Mr. Haji Abdul Majid Mondol had decided in a resolution to start a company in Nayapara, Kashimpur, Gazipur in the year 1991 to manufacture knitwear garments for the international market. Right from inception the policy of the company has been to provide total customer satisfaction by offering quality knitwear in time. To meet the commitments of quality and prompt delivery, Montex Knit Composite Limited Decided to integrate the manufacturing process in a planned manner. Over the years the entire process has been integrated by importing sophisticated machinery from world-renowned manufacturers.

Working on new concepts in styling & content of the knitwear is a continuous activity in Montex Knit Composite Limited with an objective to up the quality and the value of merchandise. In 1991, the year in which International business was started; Montex Knit Composite Limited concentrated all its strengths and resources in developing a wide range of knitwear for the international market.

## **2.6 Vision & Mission of the Project**

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

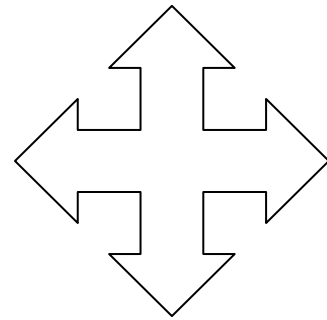
To attain these objectives, the management of Montex Knit Composite Ltd. has decided to adopt the following

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

## 2.7 Location of the Project

Tongi

Gazipur Chowraste



**Kashimpur Road**

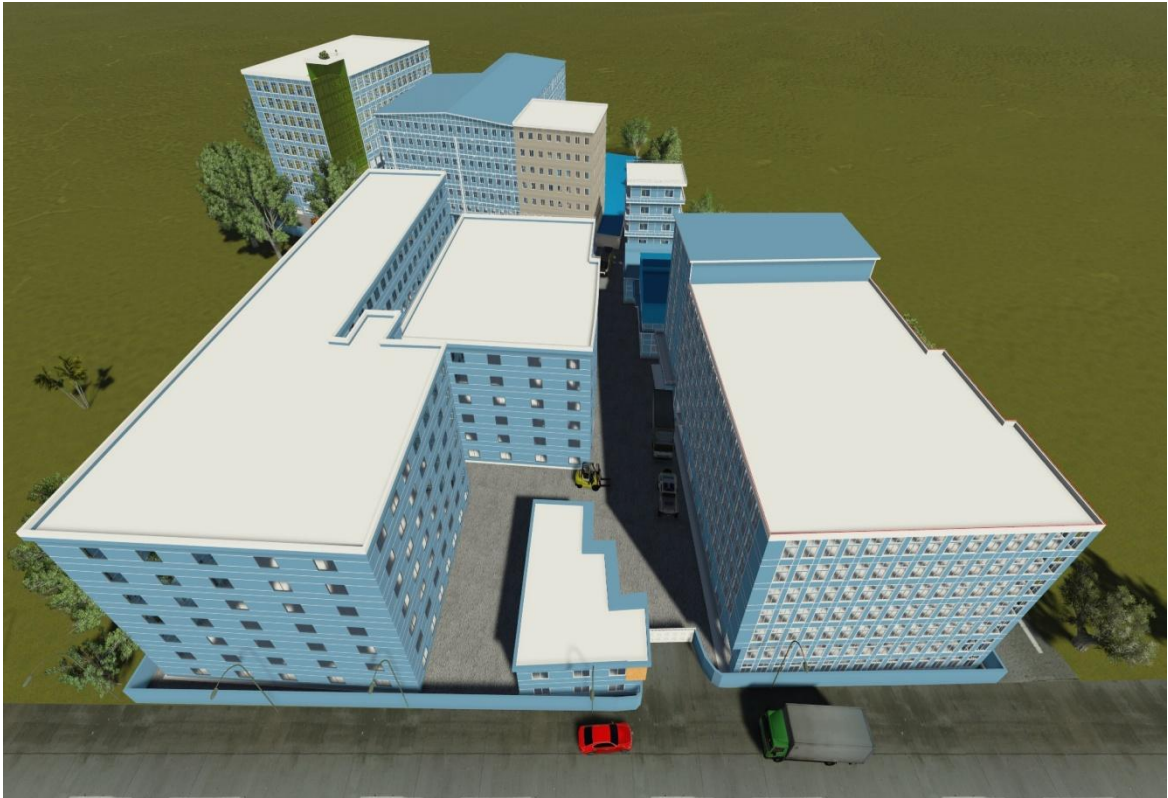
**Nayapara**

**Kashimpur**

**Konabary**

- Mondol Fabris,
- Mondol Knit Dyeing
- Mondol Yarn Dyeing
- Mondol Garments
- Montex Garments.
- Montex Dyeing.





**Fig: Outside view of Montex Fabrics Ltd.**

## **2.8 Methodology of the Study**

This is a descriptive type of report that has undertaken insights and understanding about overall operation of Montex fabrics Ltd. This report is prepared on the basis of primary and secondary sources. The relevant information was collected through direct interview of the personnel engaged in various departments of Montex fabrics Ltd. The secondary information was collected from different past files, which were collected from personal visit of the company files.

## **2.9 Sources of Information**

In order to make the report more meaningful, two sources of data have been collected.

### **Primary data source**

- Face to face conversation with the respective officers and staffs of the Factory.

- Practical work experience from different department of the organization.

### **Secondary data source**

- Previous documents of the organization.
- Various books, articles and manuals etc.
- Different web sites include the official website of Montex Fabric Ltd.

### **2.10 Management System**

- Intercom telephone
- Fax
- E-mail
- Written letters
- Oral

### **2.11 Duties & Responsibilities of Production officer**

1. To collect the necessary information and instruction from the previous shift for the smooth running of the section.
2. To make the junior officer understand how to operate the whole production process.
3. To match production sample with target shade.
4. To collect the production sample lot sample matching next production.
5. To observe dyed fabric during finishing running and also after finishing process.
6. To identify disputed fabrics and report to PM/GM for necessary action.
7. To discuss with PM about overall production if necessary.
8. To sign the store requisition and delivery challan in the absence of PM
9. To execute the overall floor work.
10. To maintain loading/ unloading paper.
11. Any other assignment given by the authority.

## **2.12 Duties & Responsibilities of Senior Production officer**

1. Overall supervision of dyeing and finishing section.
2. Batch preparation and pH check.
3. Dyes and chemicals requisition issue and check.
4. Write loading / unloading time from machine.
5. Program making, sample checking, color measurement.
6. Control the supervisor, operator, and asst. operator and helper of dyeing machine.
7. Any other work as and when required

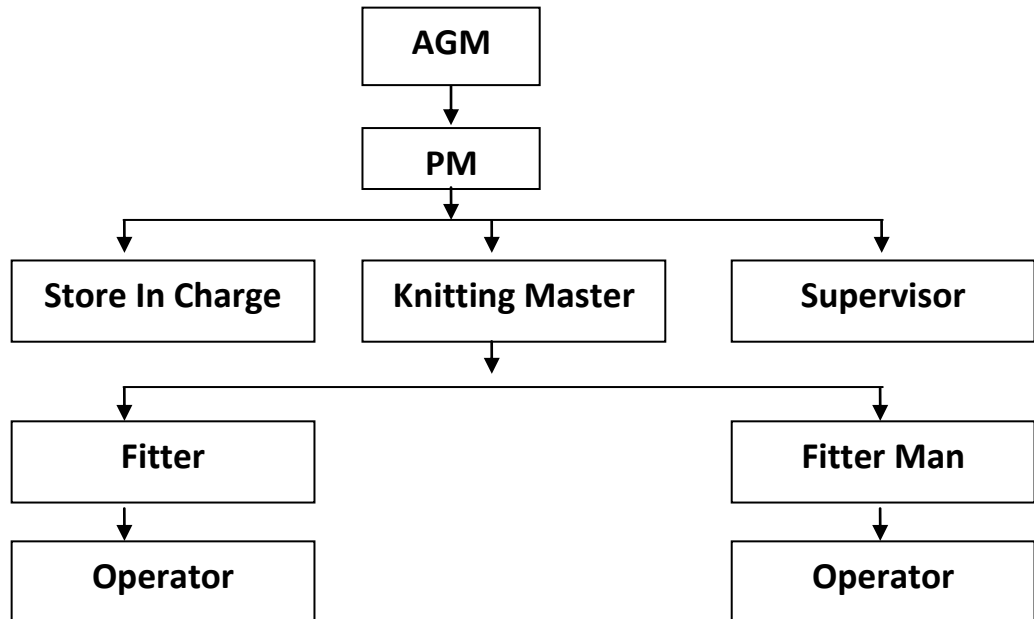
## **2.13 Duties & Responsibilities of DGM (production)**

1. Overall supervision of dyeing and finishing section.
2. Check the sensitive parameters of different machines for smooth dyeing.
3. Check the different log books and report to management.
4. Check the plan to control the best output.
5. To trained and motive the subordinates how to improve the quality production.
6. Control the supervisor, operator, asst. operator and helper of dyeing m/c.
7. Maintenance the machinery and equipments.
8. Any other work as and when required.

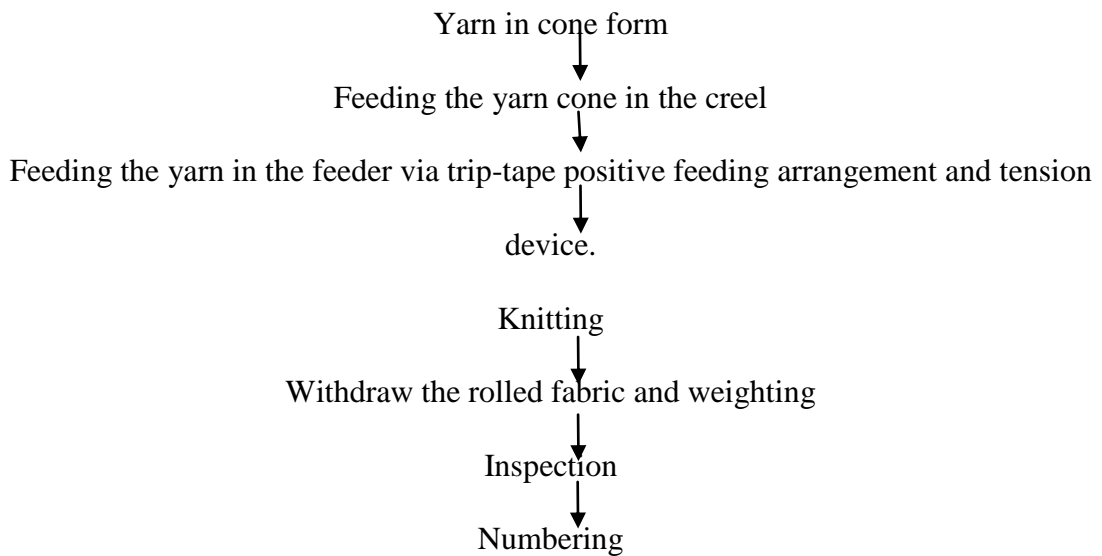
### **3. DESCRIPTION OF THE ATTACHMENT**

### 3.1. Knitting Section

#### 3.1.1 Organogram of Knitting Section



#### 3.1.2 Flow Chart of Knitting Section



### 3.1.3 Raw Material

Types of raw material

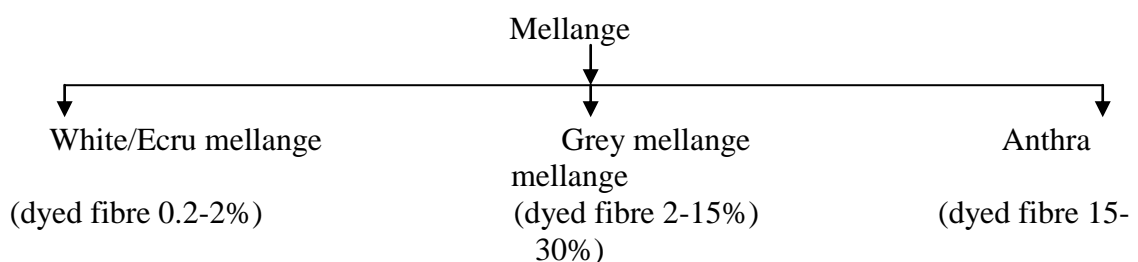
1. Yarn
2. Lycra

### 3.1.4 Name and Source of yarn

The raw material (cotton yarn) used in Knitting are collect from various Spinning mill. They buy carded and also combed yarn according to their buyer requirement. The yarn count range vary for carded yarn from (34/1) to (7/1) Ne. The yarn count range vary for combed yarn from (40/1) to (20/1) Ne.

<b>Square Spinning mill</b>	<b>Basher spinning mill</b>
<b>Kamal spinning mill</b>	<b>Prime Spinning mill</b>
<b>Aman spinning mill</b>	<b>RK Spinning mill</b>
<b>Fariha spinning mill</b>	<b>JK Spinning mill</b>
<b>Karim spinning mill</b>	<b>AKIJ Spinning mill</b>
<b>Rising spinning mill</b>	<b>Youth Spinning mill</b>
<b>Shirin spinning mill</b>	<b>Kader Spinning mill</b>

### Mellange



**Sources of mellange:**

Patartoli  
 Prime  
 Shohag pur  
 Thermax

**Sources of polyester**

Kader Synthetic.  
 China.  
 Count: 20den, 40den, 75den, 100den, 150den.

**Sources of lycra**

Brand : Roica  
 Company : Taiwan

Brand : Texlon  
 Country : korea.

Brand : Acelen  
 Country : China

Brand : Creora  
 Country : Japan

Brand : Lioli (In Viyellatex used mostly)  
 Country : China

Count: 20 den, 40 den, 70 den.

**3.1.5 Price List of Different Types of Yarn****Cotton:**

Yarm	Combed Yarm	Carded Yarn
40/1	3.65\$/Kg	2.65-2.7 \$/Kg
34/1	3.00 \$/Kg	2.5-2 \$/Kg
32/1	2.90 \$/Kg	2.30 \$/Kg
32/1	2.90 \$/Kg	2.30 \$/Kg
30/1	2.70 \$/Kg	2.30 \$/Kg
28/1	2.70 \$/Kg	2.25 \$/Kg
26/1	2.65 \$/Kg	2.25 \$/Kg
24/1	2.60\$/Kg	2.25 \$/Kg
22/1	2.55\$/Kg	2.25\$/Kg
20/1	2.50\$/Kg	2.15-2.5 \$/Kg

## **Polyester yarn**

Kader Synthetic- 2.40\$/Kg  
China - 1.60 \$/Kg

## **Lycra yarn**

20 den - 12.70 \$/Kg  
40 den – 8.40 \$/Kg  
70 en 7.50 \$/Kg

### **3.1.6 Key Accessories for Knitting**

Key Accessories used for circular knitting fabric process which are:

- ✓ Cylinder
- ✓ CAM
- ✓ Needle
- ✓ Sinker
- ✓ Positive feed system
- ✓ Motor
- ✓ Inventor
- ✓ Belt
- ✓ VDQ quality pulley
- ✓ Pattern wheel

### **3.1.7 Parts of Knitting Machine**

**Creel:** Creel is used to place the cone.

**Feeder:** Feeder is used to feed the yarn.

**Tensioning device:** Tensioning device is used to give proper tension to the yarn.

**VDQ pulley:** VDQ pulley is used to control the GSM by controlling the stitch length.

**Guide:** Guide is used to guide the yarn.

**Sensor:** Sensor is used to see & the machine stops when any problem occurs.

**Spreader:** Spreader is used to spread the knitted fabric before take up roller.

**Take up roller:** Take up roller is used to take up the fabric

**Fixation feeder:** These types of feeder are used in Electrical Auto Striper Knitting



Machine to feed the yarn at specific finger.

**Rethom:** These device are used in Electrical Auto Striper Knitting machine



**Fig: Knitting circular m/c**

### 3.1.8 Machine Description of Knitting Section

Machine Name	Number of machine	Production per shift(kg)
S/J Machine (JIUNN LONG)	15	4 Ton.
S/J Machine (Ta Yu M/C)	08	2.3 Ton.
Rib Machine (JIUNN LONG)	03	1.2 Ton.
Rib Machine (Ta Yu M/C)	05	1.6 Ton.
Interlock Machine(JIUNN LONG)	04	1.6 Ton.
InterlockMachine(TaYu M/C)	05	1.5 Ton.

## Knitting Machine

SL. No.	Cylinder dia	Dial dia	Gauge	No of feeder	Fabric type	Brand	Origin
1	17		24	68	S/J	JIUNN LONG	Tiawan
2	18		24	72	S/J	JIUNN LONG	Tiawan
3	20		28	80	S/J	JIUNN LONG	Tiawan
4	22	22	18		Interlock	JIUNN LONG	Tiawan
5	24		24	36	S/J	TaYuM/C	China
6	26		28	78	S/J	TaYuM/C	China
7	20		24	60	S/J	JIUNN LONG	Tiawan
8	32		24	96	S/J	TaYuM/C	China
9	30		24	90	S/J	JIUNN LONG	Tiawan
10	38	38	12	80	Interlock	Ta Yu M/C	China
11	30	30	18	60	Rib	Ta Yu M/C	China
12	34	34	22	68	Interlock	JIUNN LONG	Tiawan
13	34	34	22	70	Interlock	JIUNN LONG	Tiawan
14	32		28	66	S/J	JIUNN LONG	Tiawan
15	40		24	160	S/J	JIUNN LONG	Tiawan
16	30		24	120	S/J	JIUNN LONG	Tiawan
17	32	32	18	60	Rib	JIUNN LONG	Tiawan
18	30		24	120	S/J	TaYuM/C	China
19	40	40	18	80	Rib	JIUNN LONG	Tiawan
20	36	36	18	72	Rib	Ta Yu M/C	China
21	34	34	18	68	Rib	JIUNN LONG	Tiawan

### **3.1.9 End Products of Circular Knitting Machine**

#### **Single Jersey M/C:**

- S/J Plain
- Single Lacoste
- Double Lacoste
- Single pique
- Double pique
- Terry

#### **Interlock M/C:**

- a) Interlock pique
- b) Eyelet fabric
- c) Mash fabric

#### **Rib M/C:**

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

#### **End products of Flat Bed Knitting Machine:**

- a) Collar.
- b) Cuff.

### **3.1.10 Considerable Points to Produce Knitted Fabrics**

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

- Type of Fabric or design of Fabric.
- Finished G.S.M.
- Yarn count
- Types of yarn (combed or carded)
- Diameter of the fabric.

- Stitch length
- Color depth.

### 3.1.12 Production Calculation

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

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

#### B. Production/shift in meter:

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

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

#### C. Fabric width in meter:

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

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

### 3.1.13 Some Points are needed to maintain for High Quality Fabric

- a) Brought good quality yarn.
- b) Machines are oiled and greased accordingly.
- c) G.S.M, Stitch length, Tensions are controlled accurately.
- d) Machines are cleaned every shift and servicing is done after a month.
- e) Grey Fabrics are checked by 4 point grading system

### **Changing of GSM:**

- Major control by VDQ pulley.
- Minor control by stitch length adjustment.
- Altering the position of the tension pulley changes the G.S.M. of the fabric. If pulley moves towards the positive direction then the G.S.M. is decrease. And in the reverse direction G.S.M will increase.

### **Other m/c in knitting section**

1. Gray Inspection M/c, Brand: Uzu fabric inspection machine
2. Electric Balance for Fabric Weight.
3. Electric Balance for GSM check.
4. Compressor 2 pieces

### **Production Parameter:**

- ❖ Machine Diameter;
- ❖ Machine rpm (revolution per minute);
- ❖ No. of feeds or feeders in use;
- ❖ Machine Gauge;
- ❖ Count of yarn;
- ❖ Required time (M/C running time);
- ❖ Machine running efficiency.

## **3.1.14 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:**

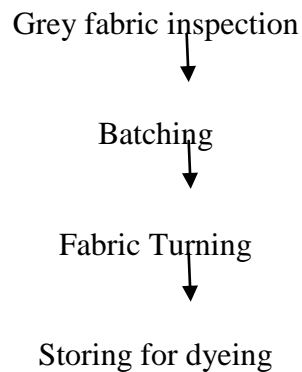
- Ensure that oil does not pass on the fabrics. ® Well maintenance as well as proper oiling.

## **7 . Yarn Faults:**

- Naps.
- Slubs.
- Yarn count.
- Thick/Thin place in yarn.
- Hairiness.

## 3.2 Batching

### Batch process follow-up:



### 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, PE, 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.



### 3.2.1 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),

**Considerable point:** Batch selection depends on Fabric GSM.

### 3.2.2 Machines in Batch Section

#### M/c quantity: 02

#### M/c Specification:

<b>Machine Name</b>	<b>: Air turning m/c</b>
M/c No	:01
Brand Name	: Taida
Origin	: China
M/c Speed	: 300-500m/min
Model	: DF 200
Max up clothing	: 150 kg
Company	:Shandong Taida Dyeing & Finishing
Machinery Co.Ltd	

<b>Machine Name</b>	<b>: Air turning m/c</b>
M/c No	:02
Brand Name	: Taida
Origin	: China
M/c Speed	: 300-500m/min
Model	: DF 200
Max up clothing	: 150kg
Company	: Shandong Taida Dyeing & Finishing
Machinery Co.Ltd.	

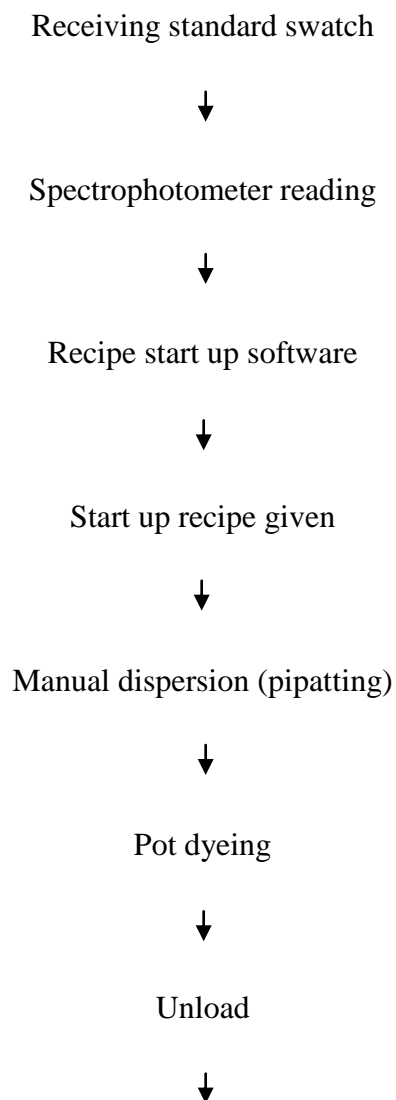
### 3.3 Lab Dip

#### 3.3.1 Objective of Lab Dip

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 Spectroflash.
- To calculate revise recipe for sample dyeing.
- Finally approved Lab Dip(Grade: A B C)

#### 3.3.2 Development of Lab Dip in Montex Complex



Normal wash



Acid wash



Hot wash



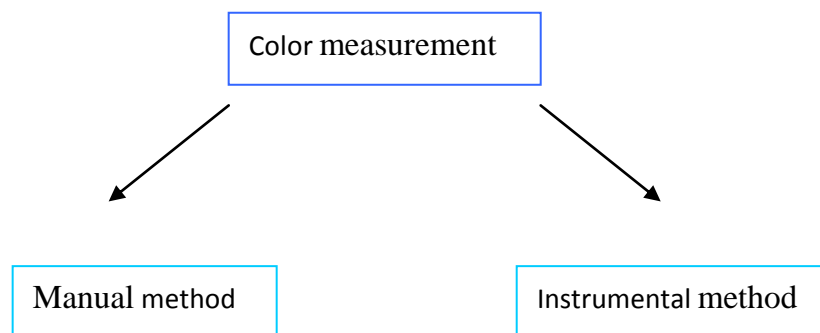
Cold Rinsing



Drying

### 3.3.3 Color Measurement Of Standard Sample

Color measurement can be done by two methods –



In manual method, the std. sample's color is measured by comparing it with previously produced samples of different tri-chromatic color combination. The sample with which the color of the std. matched, that sample's color recipe is being taken for shade matching .

The instrumental method is more reliable if it is operated accurately to do the work of color measurement. "Spectrophotometer" interfaced with a PC is used for shade

matching. In this way, color measurement of the standard sample is carried out for the purpose of shade matching.

### 3.3.5 Preparation and Storage of Stock Dyes and Chemicals

#### Preparation of Concentration of stock dye sol<sup>n</sup> -

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

#### Preparation of Concentration of stock chemical sol<sup>n</sup> -

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

### 3.3.6 Dyes and Chemicals Measuring Formula for Laboratory

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

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

Example –

In recipe, Fabric wt. = 5gm

Shade % = 2%

[If used 0.5 % stock sol<sup>n</sup> of dyes] then ,

$$\text{Amount of dye sol}^n \text{ (ml)} = \frac{5 \times 2}{0.5} = 20\text{ml}$$

**The amount of chemical sol<sup>n</sup> (ml) is measured as follow -**

$$\text{Amount of chemical soln (ml)} = \frac{\text{Fabric wt.} \times \text{M : L} \times \text{g/l}}{1000 \times \text{Conc. of stock sol}^n \text{ \%}}$$

Example –

In recipe, Fabric wt. = 5 gm

Salt = 20 g/l

$$M: L = 10$$

[ if taken 25 % stock sol<sup>n</sup> of salt ] then ,

$$5 \times 10 \times 20$$

Amount of chemical soln (ml) = ----- = 4 ml

$$1000 \times 0.25$$

### 3.3.7 Stock Solution Preparation

SHADE %	STOCK SOLUTION %
0.0001-0.009	0.1
0.10-0.99	0.5
1-1.99	1
2-3.99	2
4 TO MORE	4

### 3.3.8 Procedure of Lab Dip

#### A. FOR 100% COTTON FABRIC (ALL IN ONE METHOD):

- Fabric weight measured by electric balance.
- Calculate the recipe.
- Keep the fabric in the pot.
- Then required amount of dyes, water, salt, soda and other chemicals are taken to the pot by pipe ting .
- Start the program for dyeing. The dyeing time and temperature depend on types of dyes being used.

Program – 1: For light shade

Fixed temp. = 60<sup>0</sup>c

Time = 60 min.

Program – 2: For dark shade

Fixed temp. = 80<sup>0</sup>c

Time = 60 min.

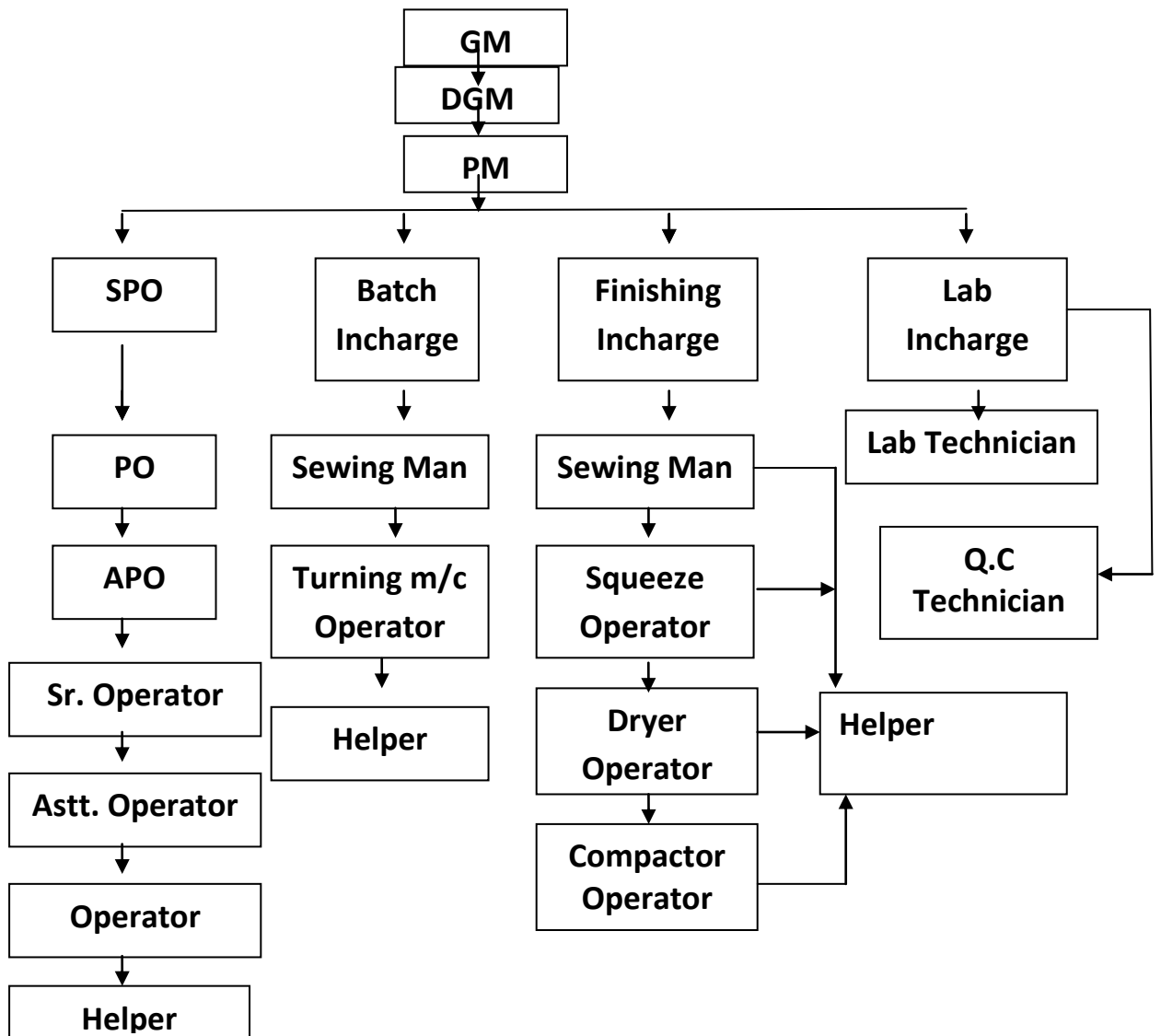
- After finished the dyeing time then cold wash two times.
- Acid wash for neutralization.
- Then soaping by required soap solution for 10 min. at 95<sup>0</sup>c.

### 3.4 Dyeing

Raw materials used in the dyeing section are:

- Grey fabrics
- Dyes
- Chemicals.

#### 3.4.1 Organogram of Dyeing and Finishing Section



### 3.4.2 Grey Fabrics

Following types of gray fabrics are dyed

- Single jersey
- Single jersey with lycra
- Polo pique
- Back Pique
- Single lacoste
- Double Lacoste
- Fleece
- Rib
- Rib with lycra
- 1X1 rib
- 2X2 rib
- Different types of collar & cuff.

Different Types of Dyes Used In Montex With Their Brand Name:

### 3.4.3 Reactive Dyes

BRAND NAME	COUNTRY NAME	NAME OF DYE STUFF

DY-STAR	GERMANY	Remazol Golden Yellow RGB Remazol Deep Black RGB Remazol Deep Black GWF Gran Remazol Red RGB Gran Remazol Turquoise Blue G133% Remazol Brilliant Blue R Spec Remazol Brilliant Blue BB 133% Gran Remazol Ultra Carmine RGB Remazol Ultra Carmine RGB GR Levafix Rubine CA Gran Levafix Red CA Gran Levafix Olive CA Gran Levafix Fast Red CA Gran Levafix Brilliant Red E-4BA Gran Dianix Navy CC Dianix Turquoise S-BG
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BENZEMA	SWITZERLAND	Bezaktive Blue S-GLD 150 Bezaktive Yellow S-3R 150 Bezaktive Red S-3B 150
CLARIANT	SWITZERLAND	Drimarene Yellow K-4G CdG
HUNTSMAN	SWITZERLAND	Terasil Red W-4BS Terasil Nevy W-RS Novacron Red FN-R-01 Novacron Yellow F-4G
JIHUA	CHINA	Starfix Black B 150% StarfixRedEP150%
SUMIFIX	JAPAN	Sumifix Supra Blue E-XF Sumifix Supra Yellow E-XF



SUN COLOR	KOREA	Sunfix Navy Blue MF-D
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### 3.4.4 Disperse Dyes

BRAND NAME	COUNTRY NAME	NAME OF DYE STUFF
HUNTSMAN	SWITZER LAND	Terasil Golden Yellow W -3R

### Different types of chemicals used in montex with their brand name

CHEMICAL NAME	BRAND NAME	COUNTRY NAME
Wetting agent	Felson NOF	Germany
Levelling agent	A-41	China
Anti-creasing agent	Kapavon CL	Germany
Per Oxide Stabilizer	Kapazon H-53	Germany
	CBB	
	Rucorit Wez	
Caustic	Caustic	China
Soda Ash	Soda Ash	China
H <sub>2</sub> O <sub>2</sub>	H <sub>2</sub> O <sub>2</sub>	China+Korea
Optical Brightening Agent	Uvitex-BMA	Switzerland
	Uvitex-BHV	
	Uvitex-BBT	
	Syno White 4Bk	Korea
H <sub>2</sub> O <sub>2</sub> Killer	Kapatex-PKS	Germany

Acetic Acid	Acetic Acid	India
Sequestering Agent	Securon-540	China
	CS	
	Polyclean-SP	India
Enzyme	Bio-ACE	China
	Biopolish-B41	Srilanka
Electrolyte / Salt	Sodium Sulphate Anhydrose	India

	Glubar Salt	
Detergent	Rukozen-WBL	Germany
	Diwet PIUS	India
Soaping Agent	Rukozen-NZA	Germany
	Dekol ISN	China
	Cyclonon XEW	
Softener	Nero soft- JS(an-ionic)	China
	Nerosoft-NI(non-ionic)	
	Purrustol-IMA	Germany
Fixing Agent	Sandoflx-EC	Germany
	ProtanFCE-375	

### 3.4.5 Machine Description

Sl. No	M:L Ratio	Maximum Temp. °C	No. of Nozzle	Capacity in kg.	Pressure in Bar	Manufacturer	Origin
01	1:6	135	2	450	3.5	Dilmenler	Turkiye
02	1:8	135	3	1200	3.5	Dilmenler	Turkiye
03	1:6	135	2	600	3	Dilmenler	Turkiye
04	1:8	100	3	1000	3.5	Dilmenler	Turkiye
05	1:8	100	3	900	3.5	Dilmenler	Turkiye
06	1:8	135	2	800	3	Dilmenler	Turkiye
07	1:8	135	2	450	3.5	Dilmenler	Turkiye
08	1:8	100	3	1200	3	Dilmenler	Turkiye
09	1:8	100	2	600	3	Dilmenler	Turkiye
10	1:8	100	1	50	3	Dilmenler	Turkiye
11	1:8	100	1	50	3.5	Dilmenler	Turkiye
12	1:8	135	3	1200	3.5	Dilmenler	Turkiye
13	1:8	135	3	1000	3	Dilmenler	Turkiye
14	1:8	100	2	800	3	Dilmenler	Turkiye
15	1:6	135	2	450	3.5	Dilmenler	Turkiye

16	1:8	135	2	800	3.5	Dilmenler	Turkiye
17	1:8	100	3	1200	3	Dilmenler	Turkiye
18	1:8	135	2	450	3.5	Dilmenler	Turkiye
19	1:8	135	1	20	3	Dilmenler	Turkiye

### 3.4.6 Recipe at Different Stage in Dyeing

#### Recipe for machine's heavy wash:

Detergent = 0.5 gm/L

Caustic = 1 gm/L

Hydrous = 2 gm/L

60minat90°C

#### For machine neutralization:

Acetic acid = (As required) gm/L

#### Recipe for scouring and bleaching :( For cotton)

Wetting agent (Felson NOF) =0.7 gm/1

Stabilizer (Kapazon H53) =0.5 gm/1

Anti creasing agent (Kapavon-CL) = 1 gm/1

Caustic = 2 %

Hydrogen per oxide ( H<sub>2</sub>O<sub>2</sub> ) =2.5 %

Sequestering agent (Securon-540) =0.5 %

Hydrogen per oxide killer (Kapatex-PKS) =2.5 %

60minat105°C

#### Recipe for hot (cotton black):

Wetting agent (Felson NOF) = 0.5gm/L

Sequestering agent (Securon-540) = 0.75 gm/L

Caustic = 1 gm/L

10minat80°C

#### Recipe for enzyme treatment: :( For cotton)

Wetting agent (Felson NOF) =0.1 gm/L

Acid (acetic acid) = 1 gm/L

Enzyme (BIO Ace / Biopolish B- 1 1 ) = 0.75 gm/L

50minat55°C

#### Recipe for leveling :( For cotton)

Anti creasing agent (Kapavon-CL) = 1gm/L

Levelling agent (A-4 1 ) = 0.5gm/L  
10minat60°C

**Recipe for softening:**

Sapamine CWS (Anionic) = 1.5% (For color)  
Nerosoft-NI (Non ionic) = 1.5% (For white)  
10minat45°C

**Recipe for Reduction (Polyester):**

Caustic = 2 gm/L  
Hydross = 2.5 gm/L  
20minat90°C

**3.4.7 Sequence of Operation for Knit Dyeing**



**Production Parameters:**

- During H<sub>2</sub>O<sub>2</sub> bleaching P<sup>H</sup> 9.2-12(Alkaline)
- During reactive dyeing P<sup>H</sup> 10.5-12.5(Alkaline)
- During disperse dyeing P<sup>H</sup> 4.5-6.0 (Acidic)

### 1) Temperature:

- For cotton scouring: 90°-95°C
- For cotton cold wash: 30°-40°C
- For cotton hot wash: 70°-80°C
- For cotton acid wash: 60°-70°C
- For cotton dyeing: 80-90°C (For hot brand)  
60°C (For cold brand)
- Polyester dyeing: 100°-130°C

### 2) Time:

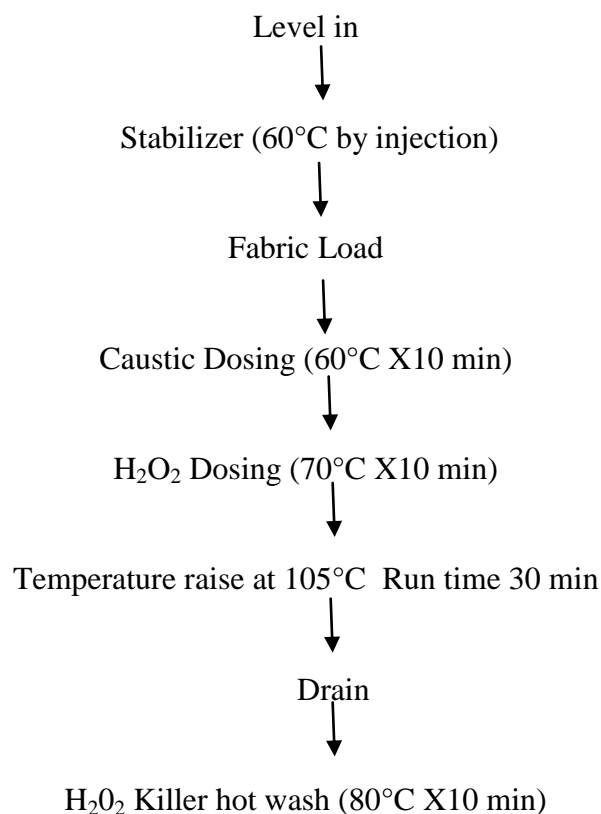
- For Scouring: 60-90 minutes
- For Disperses dyeing 60-90 minutes.

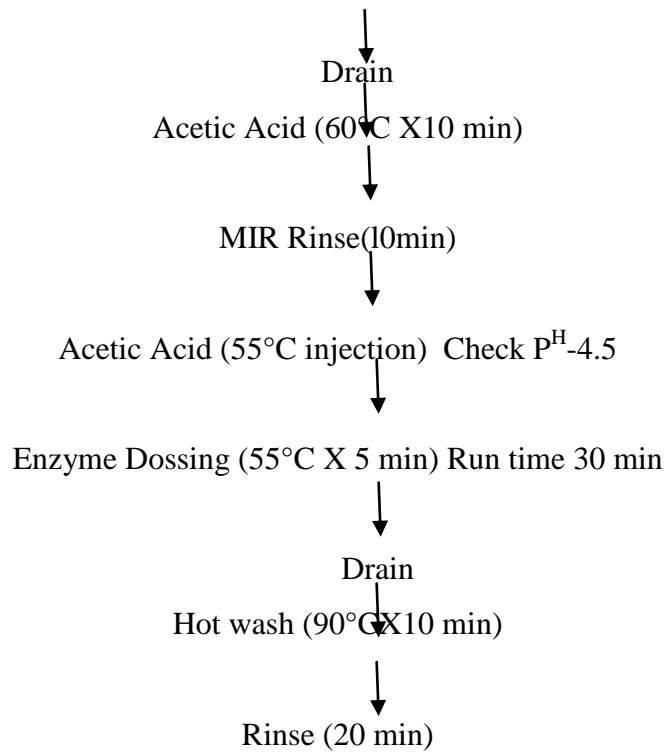
### 3) M: L ratio:

- For reactive dyeing M: L ratio maintained between 1:6 to 1:10.

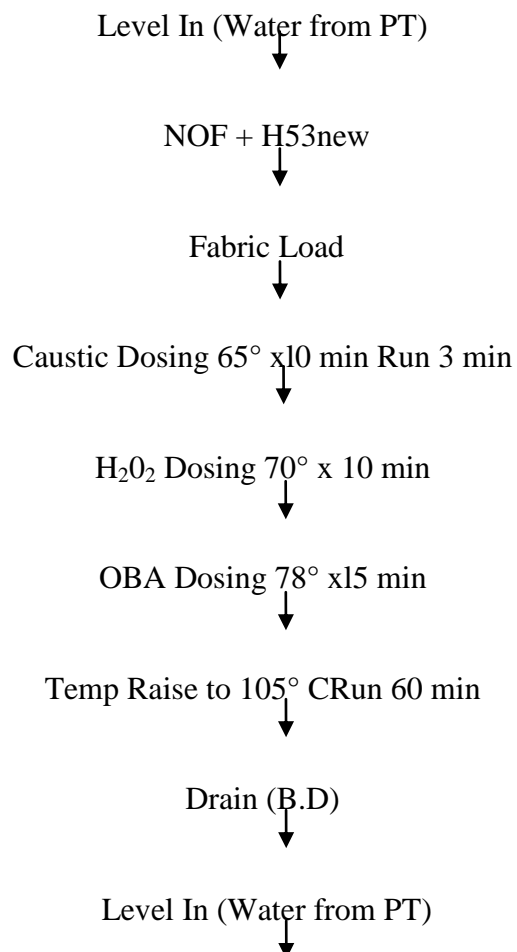
## 3.4.8 Process Flow Chart for Pretreatment

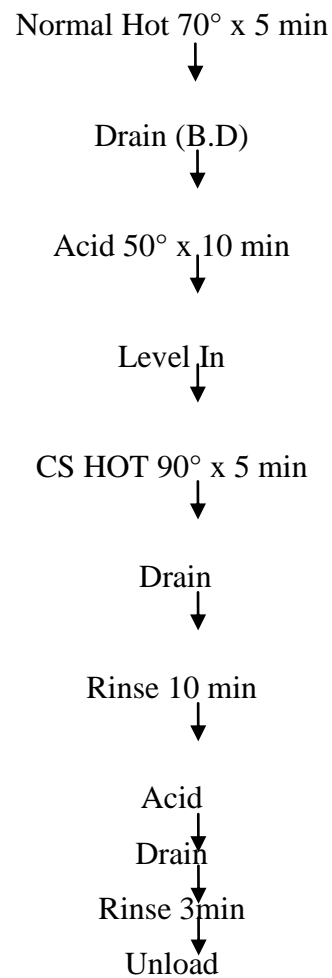
### Scouring, Bleaching & Enzyme Treatment





### 3.4.9 Flow Chart for OBA Treatment





### 3.5 Finishing

#### 3.5.1 Machine Description for Finishing Section

Finishing section is consisting of two lines. They are -

- A. Tube line
- B. Open line

A. The machine that are used for open line are given bellow -

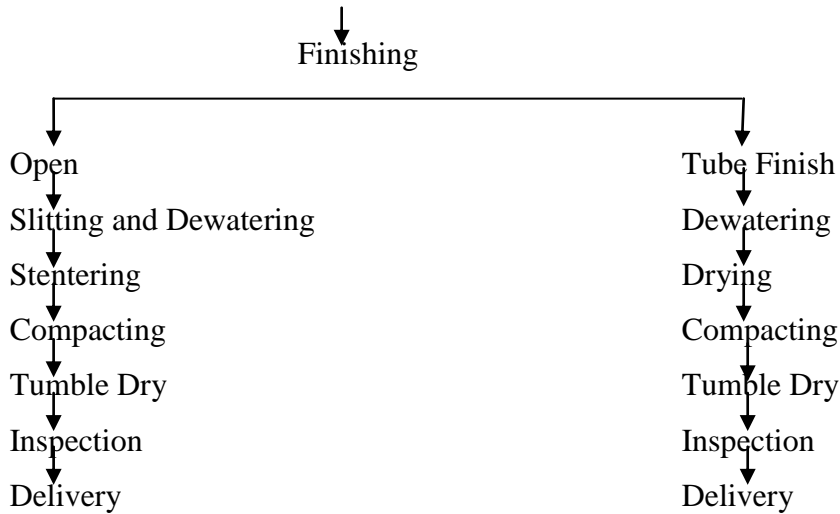
- Slitting and Dewatering machine
- Stenter machine
- Compactor machine

- Tumble Dryer

B. The machines that are used for tube line are given bellow -

- Dewatering machine
- Dryer
- Compactor machine

### 3.5.2 Process Flow Chart for Finishing Section



**N.B:** There are some Open Compactor machines; But GKL has no Open Compactor Machine.

### 3.5.3 Description of the Machine for Tube Finish

#### A. Dewatering Machine: (M/C Specification)

Brand Name: <b>Santex Ag</b>	Year of Manufacture: 1998 Type:
Company: <b>Santex Ag</b>	<b>Santastretch Plus-140</b>
Origin: <b>Switzerland</b>	Max Working Speed: 80 <b>m/min</b>
Model: <b>CH-9555, Tobel m/min</b>	Normal working Speed : 40~ 60

#### DIAGRAM OF DEWATERING M/C:





**Fig:** Dewatering Machine

**Operational parameter:**

- **Speed:** As much as possible (40-60 m/min). Higher the GSM lower the speed.
- **Over feed:** As required. Higher the GSM higher the overfeed.
- **Padder pressure:** 3-7 bar as required. Higher the GSM lower the padder pressure.
- **Width:** Fabric width is adjusted as per required width.

**N.B:** Santex contains two baths. One for padder bath and another for softener bath where softener given 1 g/l. The softener bath capacity is 80 liters.

**Special features of Santex-ag m/c :**

- Single squeeze roller and single padder present.
- One for squeezing and other for applying softener finished.
- Above 80% water can be removed
- Maximum 60 inch diameter can be extended.
- Softener tank present.

**B. DRYER MACHINE: (M/C Specification)**

Brand Name: <b>Santex ag</b>	Year of Manufacture: <b>1998</b>
Company: <b>Santex ag</b>	Type: <b>Santastretch 2K/240,GM,IR,GFI</b>
Origin: <b>Switzerland</b>	Max. Working Speed: <b>30 m/min</b>
Model: <b>CH-9555,Tobel</b>	Min. working Speed : <b>5~15 m/min</b>
Overfeed Range : 0% to -25%	Max. Temperature: <b>185°C</b>

No of Chamber: Two	No of Burner : 2
--------------------	------------------



**Fig: Dryer Machine.**

**Operating parameters: -**

- Temperaturer-Set the temperature between 120°c -130°c for white and 150°c - 170°c for color fabric.
- Set the over feed up to 10-20% or as required to get finish G.S.M.
- Set the speed as much as possible (6~20m/min). GSM speed ↑ ↓

**Special feature of Santex-as steam dryer :**

- ✓ Steam dryer (two chambers).
- ✓ Maximum temp. Increase up to 170°c.
- ✓ Steam control switch present

**C. COMPACTOR MACHINE: (M/C Specification)**

Brand Name: <b>Santex ag</b>	Year of Manufacture: <b>1998</b>
Company: <b>Santex ag</b>	Type: <b>Santa spread 140, Withoutwinder</b>
Origin: <b>Switzerland</b>	Max. Working Speed: <b>50 m/min</b>
Model: <b>CH-9555,Tobel</b>	Min. working Speed: <b>5 m/min W</b>
Overfeed Range: <b>-5% to +50%</b>	orking Speed: <b>15~25 m/min</b>
Max. Temperature: <b>100°C~139°C</b>	

**Operational parameter:-**

- Set the temperature at 110-139°C (as required)
- Set the overfeed % as required; to increase GSM, overfeed need to increase to a certain limit.

**Function:**

- Shrinkage control
- GSM control
- Width control

**Special feature of Santex -ag Compactor :**

- Operating system is computerized.
- Steam bar present which soften the fabric for compacting.
- Fabric G.S.M, shrinkage and dia control.

**DESCRIPTION OF THE MACHINE FOR OPEN FINISH**

**D. SLITTING AND DE-WATER MACHINE: (M/C Specification)**

Brand Name: <b>Corino</b>	Year of Manufacture: 2006
Company: <b>Corino</b>	Type: <b>Santastretch Plus-140</b>
Origin: <b>Italy</b>	Max capacity: 8 ton Max Speed: 80 <b>m/min</b>
Normal Working capacity: 6 ~7 ton	



**Fig:Slitting machine**

**Operational parameter:-**

- Set the padder pressure as required (3-7bar)
- Set the speed as much as possible (30-SOm/min).

**Function of the Machine:**

- Used to remove excess water after pretreatment and dyeing
- To slit the tube fabric by the knife for opening of the fabric and ready for stentering
- Delivered fabric increase free state
- It can control the diameter of fabric and GSM and shrinkage by over feeding mechanism

**E.STENTER MACHINE: (M/C Specification)**

Brand Name: <b>Alkan</b>	Year of Manufacture: 2006
Company: <b>Alkan Makina</b>	Max capacity: 8 <b>ton/day</b>
Origin: <b>Turkey</b>	Normal Working capacity: 6 ~7 ton / <b>Day</b>
No of Chamber: 6	No of Burner: 6X2=12
Max Speed: <b>40 m/min</b>	Min Speed: 10 <b>m/min</b>
Max Temp: <b>200°C</b>	MinTemp:110°C



**Fig: Stenter machine**

**Important parts:**

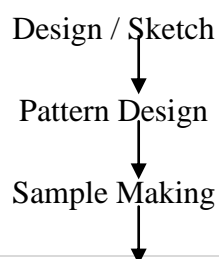
-Burner (12)	Suction Fan (12)
- Exhaust air fan (6)	Nozzle
- Over feed roller.	Chain arrangement

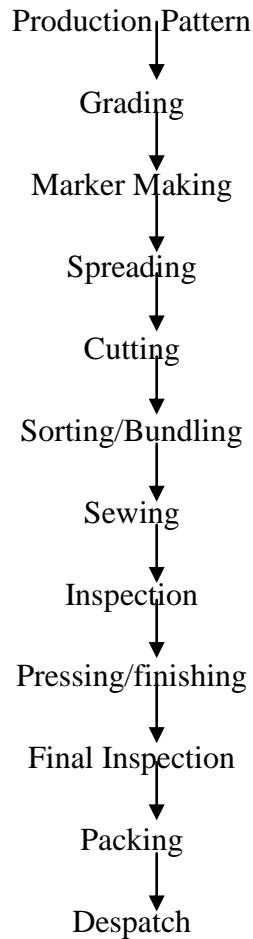
**Function:**

- Drying
- Shrinkage control
- Heat setting
- Width control
- Finishing chemical application. Loop control
- Moisture control, etc

**3.6 Garments**

**Garments Manufacturing Process:** Stepwise garments manufacturing sequence on Montex Fabrics Ltd is given below:





This is the Basic Production Flowchart of a Garment. In advance some of the process can be added or removed.

### 3.6.1 Sample Section

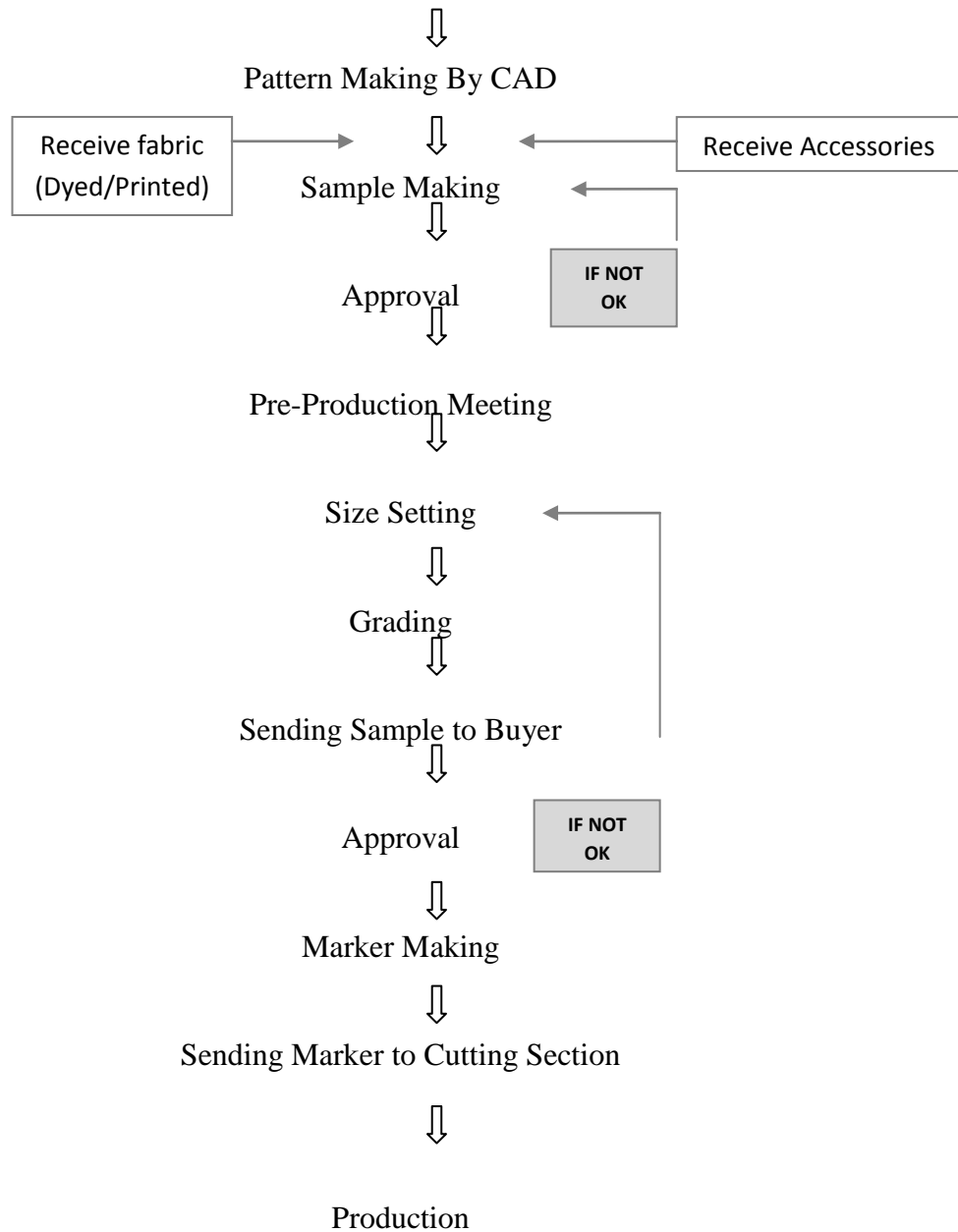
Sample is the prototype or model of the garment, upon what the buyer can decide on how and whether to confirm the order or not.

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.

In *Monetx fabrics Ltd.* the important job of product development is also performed by sample section

### 3.6.2 Operational Flow of Sample Department







Receive Specification & Measurement sheet from buyer (via merchandiser)



### 3.6.3 Types of Sample

- Proto or Development Sample
- Photo Sample
- Size set/ Grade/ Fitting Sample
- Additional sample
- Contract seal/ seal Sample
- Pre Production Sample
- Production Sample
- Sales Man Sample
- Rack Sample

### 3.6.4 Sample Requirements Different Buyer

<p> <b>GOOD MAN</b></p> <ul style="list-style-type: none"> <li>▪ <b>Develop sample</b></li> <li>▪ <b>Initial sample</b></li> <li>▪ <b>Red seal sample</b></li> <li>▪ <b>PP sample</b></li> <li>▪ <b>Goal seal sample</b></li> </ul>	<p> <b>WOMEN'S SECRET</b></p> <ul style="list-style-type: none"> <li>▪ <b>Develop Sample</b></li> <li>▪ <b>First Photo</b> (if not approved 2<sup>nd</sup> 3<sup>rd</sup>....)</li> <li>▪ <b>PP Sample</b></li> <li>▪ <b>License/Shipment Sample</b></li> </ul>
<p> <b>NEEDLE</b></p> <ul style="list-style-type: none"> <li>▪ <b>Develop Sample</b></li> <li>▪ <b>Size Set Sample</b></li> <li>▪ <b>PP Sample</b></li> </ul>	<p> <b>HUBA</b></p> <ul style="list-style-type: none"> <li>▪ <b>Develop Sample</b></li> <li>▪ <b>Size Set Sample</b></li> <li>▪ <b>PP Sample</b></li> </ul>
<p> <b>TERRANOVA</b></p> <ul style="list-style-type: none"> <li>▪ <b>First Fitting Sample</b></li> </ul>	<p> <b>SPRINGFIELD</b></p> <ul style="list-style-type: none"> <li>▪ <b>Develop Sample</b></li> </ul>

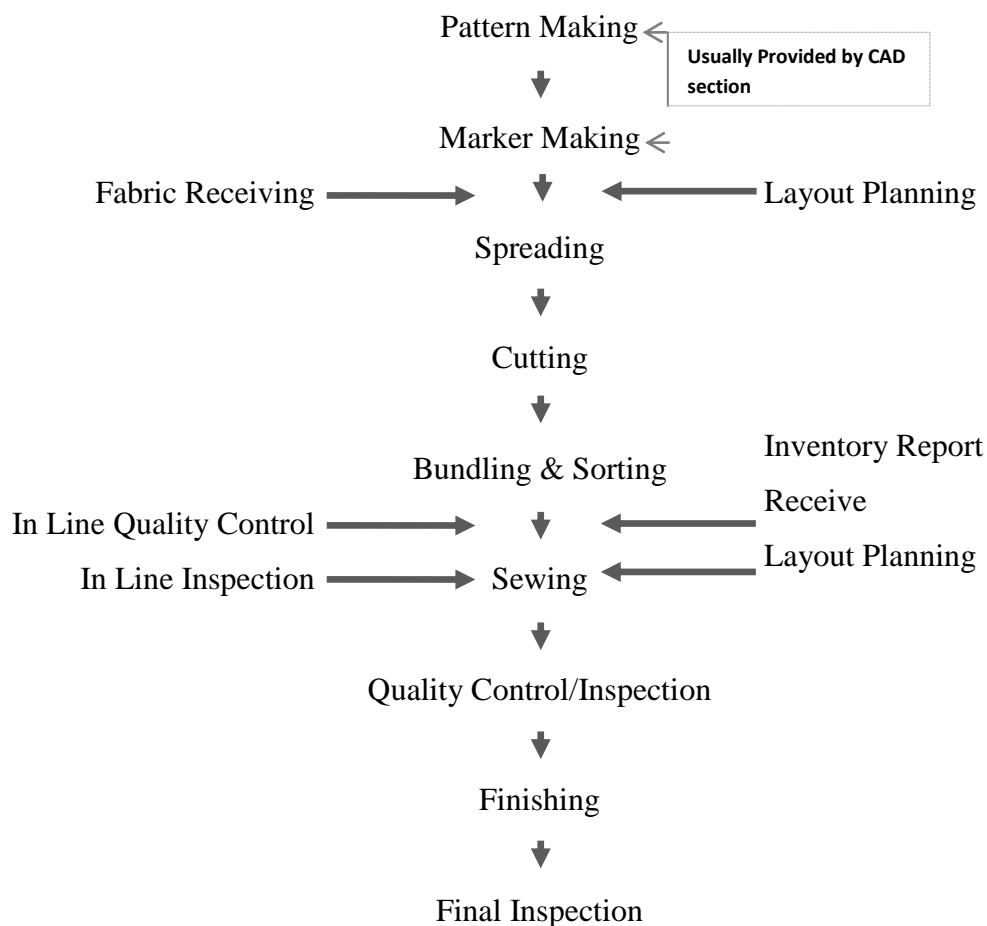


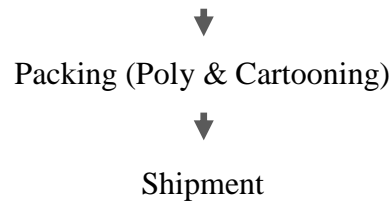
<ul style="list-style-type: none"> <li>▪ Size Set</li> <li>▪ PP Sample</li> </ul>	<ul style="list-style-type: none"> <li>▪ Franchise Sample</li> <li>▪ Convention Sample</li> </ul>
---	---

### 3.6.5 Production Department

After getting final order from buyer Production department get instruction & specification about product from merchandising department. To get finished product from raw materials different process at different stages in different department is undertaken.

### 3.6.6 Production Sequence





### 3.6.8 Pattern Making Tools (Manual)

- Straight Pin
- Straight Pin Holder
- Pen & Pencil
  - Mechanical pencil
  - Red & Blue pencil to identify pattern changes
  - Black, Red, Green & Blue felt tip Pen for pattern information.
- Scissors
  - Paper Scissor
  - Fabric Scissor
- Ruler
  - ½ X 12 Inch (Very Accurate)
  - Tailors Squares (24X14 inch metal ruler with 2 arm forming 90° angel.)
  - Triangles
- Curve Ruler
  - French Curve , Design # 17
  - Hip Curve Rule
- Ringers (Hanger hook)
- Push Pin
- Magic Mend Scotch Tape
- Black Twill Tape
- Measurement Tape
- Tailors Chalk
- Metal Weight (Several)
-

### 3.6.9 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-

$$S \leftrightarrow M \leftrightarrow L \leftrightarrow XL$$

### 3.6.10 Marker Making

It can be done both manually & Computerized method.

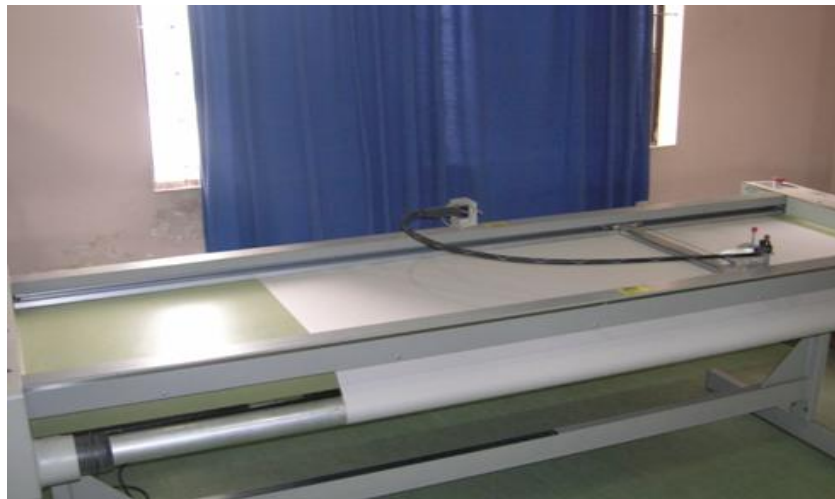
In *Montex fabrics Ltd* marker guideline is drawn in an A4 size paper by AUTOCAD. Then actual marker is drawn by hand following that miniature marker.

- 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

□ Marker is essential for cutting & bulk production. During making market the following point should be considered-

- 1) Fabric width (If F.W =60”, MW=60”-1/2”or1”) – ½”or 1” less
- 2) Select no. of garment pieces to be in marker(M-12pcs)
- 3) Select no. of sizes(M=5, L=7)
- 4) Grain direction( Length → Parallel )
- 5) Fabric characteristics - Symmetric(Solid color)  
Asymmetric(print, stripe, check)



**Fig: CAD marker plan**

### 3.6.11 Marker Efficiency

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

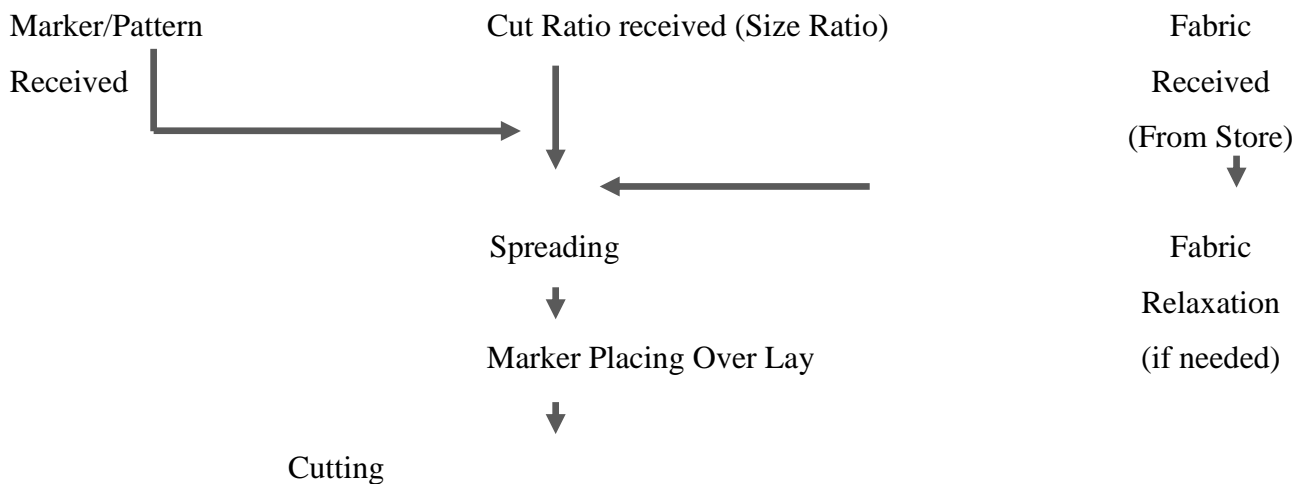
Depending on making of marker it has the following type as follows-

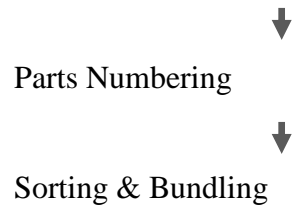
1. One way marker
2. Two way marker
3. Interactive marker
4. Auto marker
5. Paper marker
6. Fabric marker

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

### 3.6.13 Typical Sequence of Cutting Section





**Fig: Cutting Machine**

### **3.6.15 Fabric Receiving**

Fabric requirement for an order is calculated according to the average consumption of the fabric from the marker. In case of multiple color order, color wise requirement is made. Fabric department issues fabric to cutting against the fabric requirement.

### **3.6.16 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. In real practice (in Montex Fabrics Ltd) fabric relaxation time is 5-6 hour.

### 3.6.17 Spreading

Spreading refers smooth laying out of the fabric in superimposed layers of specific length. Cutting marker paper is laid in the top of the fabric layers. The maximum width of the cutting marker constrained by the usable width of fabric. The number of plies depends upon the thickness of fabric.

### 3.6.18 Types of Spreading

- ✚ Flat spreading
- ✚ Stepped Spreading

### 3.6.19 Methods of Spreading

#### ✚ Manual Method

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

#### ✚ Mechanical Method

- Semi-Automatic
- Full Automatic

### 3.6.20 Methods of Cutting

Basically Cutting Methods are of two types.

#### ➤ 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)

### 3.6.21 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.



**Fig: Numbering machine**

### 3.6.22 Sorting

According to production system (Make through, progressive bundle or one piece flow system) cut components are sorted. In sorting all component of a garment placed together. Size wise sorting and in case multiple colors are cut in a single lay, color wise sorting will be required.



### 3.6.23 Bundling

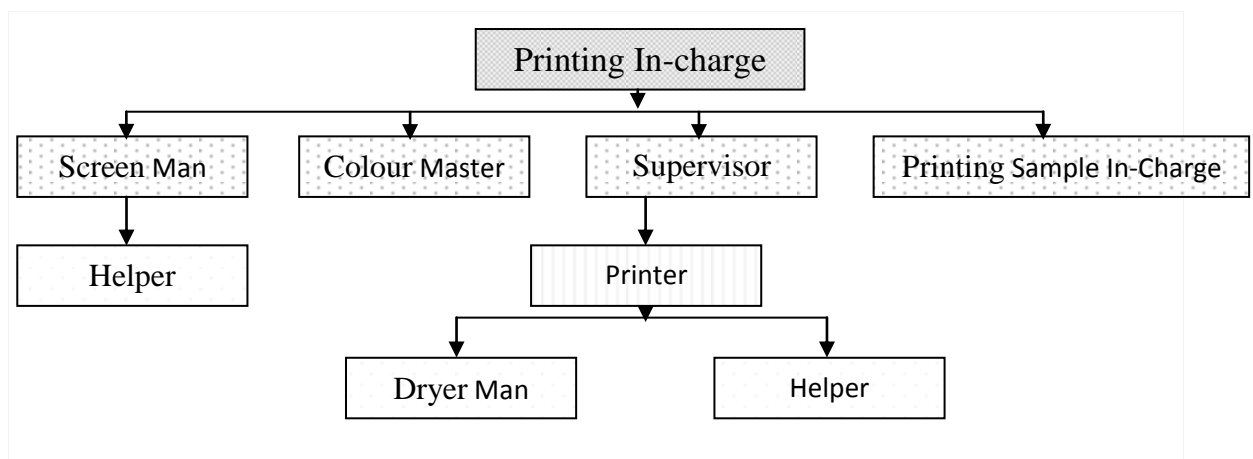
As per the production line requirement a certain number of pieces with all components are tied together. This process is known as bundling. Each bundle is marked with bundle number, style name, size number and quantity of pieces in that bundle. At this stage cutting are ready to send to production line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

## 3.7 Printing Section

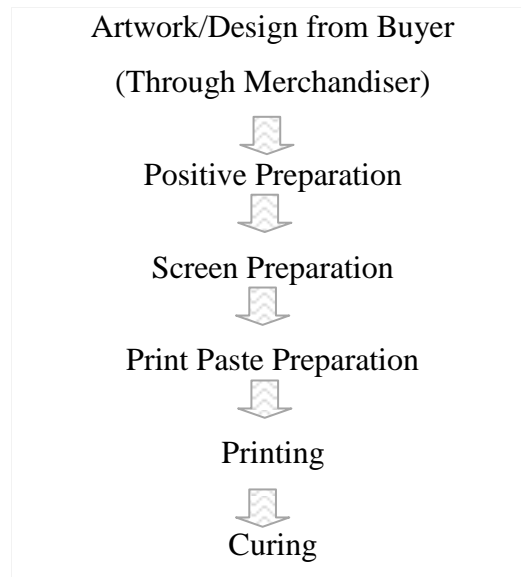
### 3.7.1 Types of Printing

- Pigment printing
- Rubber printing
- Discharge printing
- Foil printing
- Glitter printing
- High density printing
- Glossy printing
- Stone printing
- Gel printing
- Fluorescent printing
- Crack printing
- Puff printing

### 3.7.2 Organgram of Printing Section



### 3.7.3 Sequence of Printing Process



### 3.7.4 Machine Description of Printing Section

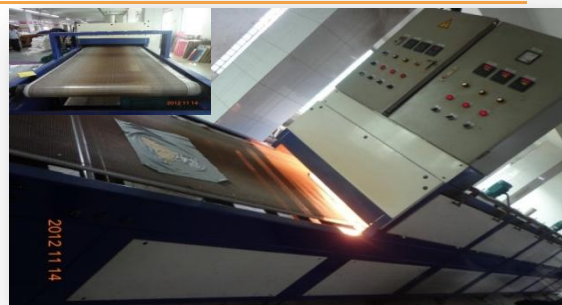
#### Machine No. 01

- Machine Name: Curing Machine
- Origin : Germany
- Year of Manufacture : 2005



#### Machine No. 02

- Machine Name : Curing Machine
- Origin : Thailand
- Year of Manufacture : 2003



---

### Machine No. 03

- **Machine Name** : **Printing M/C**
- **Origin** : **N/A**
- **Year of Manufacture** : **N/A**



---

### Machine No. 04

- **Machine Name:** **Flock Printing M/C**
- **Model** : **VT-M-PP-0610-4645**
- **Origin** : **Germany**
- **Year of Manufacture** : **2004**



**Fig: Printing table**

### 3.8 Sewing Section

Sewing is the ultimate where the main part of RMG production is performed. This is the largest section of any project.

#### 3.8.1 Machine Description of Sewing Section (Basic Machines)

M/C TYPE	BRAND	AMOUNT	ORIGIN
Single Needle Lock Stitch	JUKI	438	JAPAN
Over Lock 4 thread	JUKI	235	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	87	JAPAN
Flat Bed Flat Lock	PEGASUS	38	JAPAN
Feed of the Arm	YAMATO	8	JAPAN
Button Hole	JUKI	12	JAPAN
Button Stitch	JUKI	12	JAPAN
Bertack	JUKI	5	JAPAN
Picoating	KANSAI	3	JAPAN

#### 3.8.2 Apparel Assembling

Sewing is defined as an operation by an operator through a m/c named sewing m/c which used sewing thread to sew the fabric by forming stitch in the way of interloping, interlacing of sewing thread.

To sew a fabric by sewing m/c needle along with sewing thread is used. So to sew a fabric needle, sewing thread are important elements.

NEEDLE: Needle is used to sew the fabric by thread. Way of needle movement is retained to \_

- Seam Strength

- Seam Appearance
- Seam Durability

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

To select needle following factors should be considered as follows \_

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

During sewing needle damage is common fault. The following factors are consider as the cause of needle damage \_

- Needle heat
- Fault fabric handling
- Improper needle size
- Improper needle point
- During sewing of hard & harsh fabric

During sewing of fabric it could be damages for following factors \_

- Wrong needle point
- Quality of needle is low
- Damaged needle
- Wrong needle & thread

To select a sewing thread the following factors should be considered \_

- Needle size
- Fabric type
- Weight of fabric
- Stitch type
- Type of seam

- Seam strength
- Desired use of thread

To select sewing thread, thread size or number is very important. The number which is used to express the fineness of a sewing thread is called sewing thread number or ticket number. It has 2 system as follows-

- Cotton system : It is derived from English cotton system.  
Cotton ticket number in Ne = (Yarn count in Ne/Number of ply)x3
- Metric system : It is derived from Metric count system.  
Ticket number in Nm = (Yarn count in Nm/Number of ply)x3

### 3.8.3 Sewing Problems

There are various types of sewing problems found in sewing floor. Among these problems the following are the main –

1) Problem of formation: It has four types as follows \_

- Supplied stitch

Causes:

- Loop size of needle is small
- Bent needle
- Tension variation of looper and needle thread

- Staggered stitch (Stitch line is not parallel with seam line)

Causes:

- Bent needle
- Wrong needle point
- Improper needle adjust

- Unbalanced stitch (If bobbin thread does not work, it produces hole & forms this stitch)

Causes:

- Incorrect tension of sewing thread
- Incorrect passage of thread through guide

- Insufficient lubrication
- Frequent thread breakage

Causes:

- Improper unwinding
- Higher thread tension
- Excess heating
- Lower quality thread

2) Seam pucker : It is caused for five purposes as follows \_

- Unequal stitch on fabric due to limitation of feed m/c
- Sewing thread shrinkage after washing or ironing
- Compact fabric with high EPI, PPI is caused seam puckering during sewing.

3) Fabric damage at the seam line:

It is visible after washing and wear which is mainly caused for needle bending or improper selection of needle size. This is two types of fabric damage with needle as follows \_

- Mechanical damage(m/c speed high)
- Needle heating damage(300-350c)

### 3.8.4 Sewing Sequence of T-Shirt

Number matching front 2 back pant (back on pant on upper side)



Solder stitching (By over lock m/c)



Neck rib truck (By plain m/c)



Neck rib sewing by plain m/c

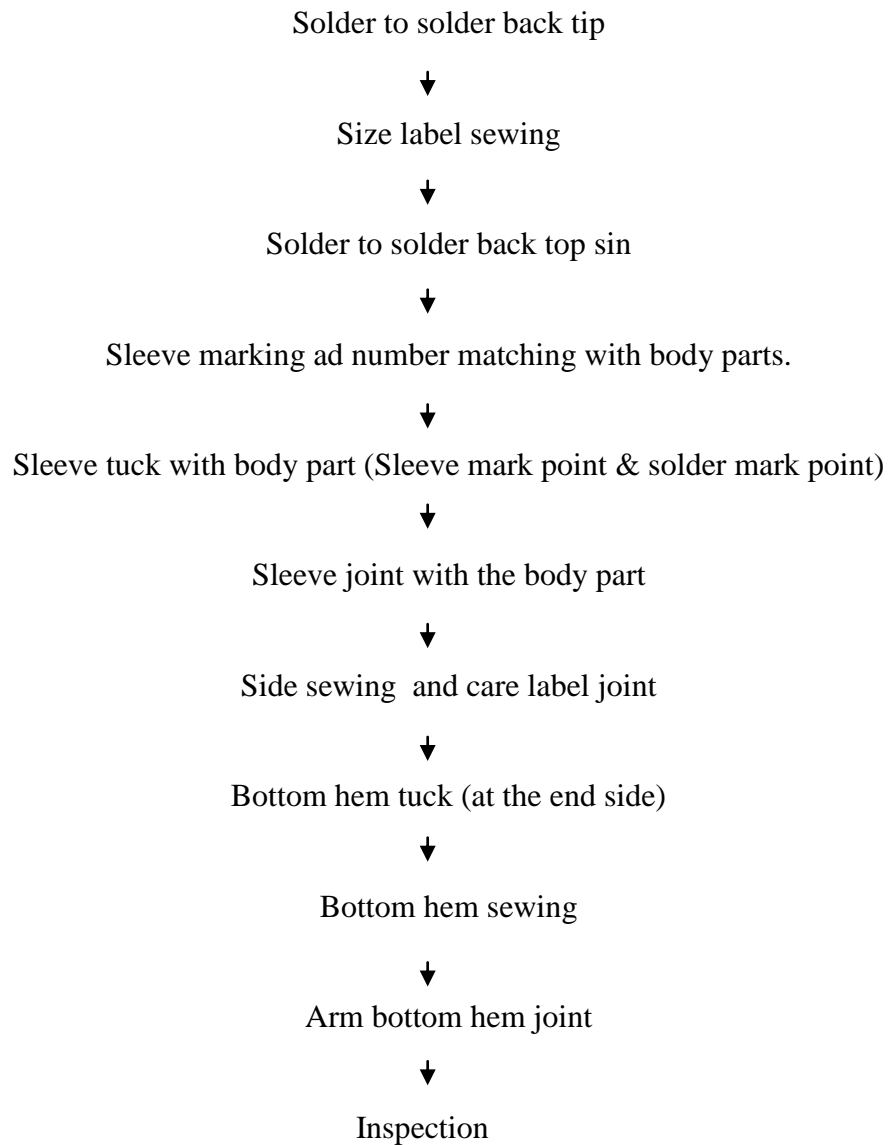


Neck rib joins with body pant

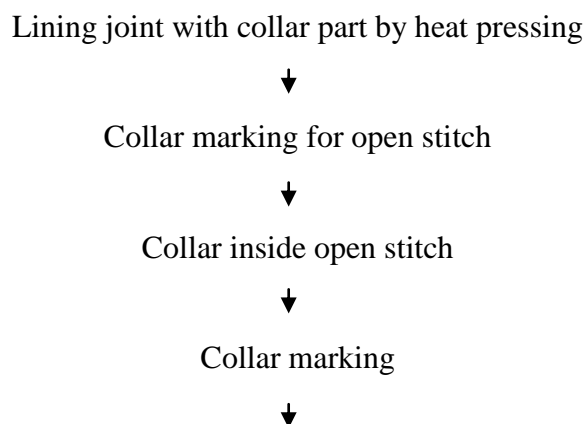


Neck top sin

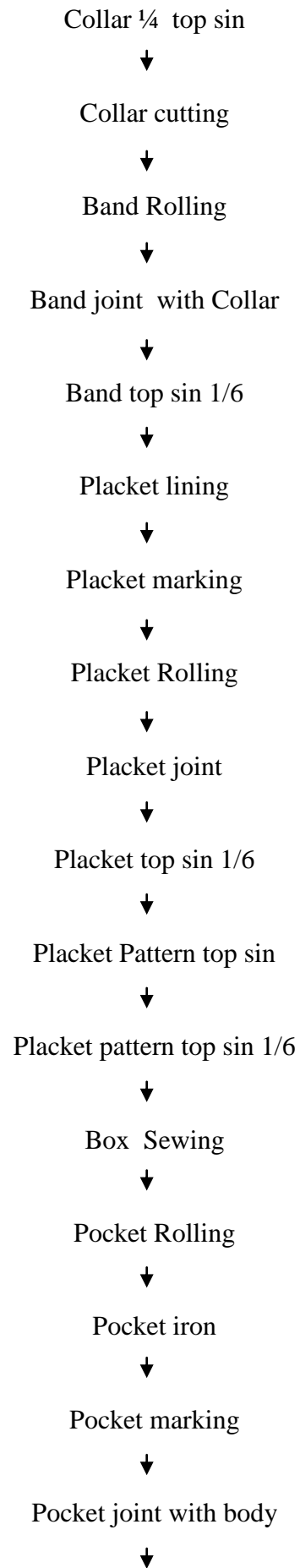


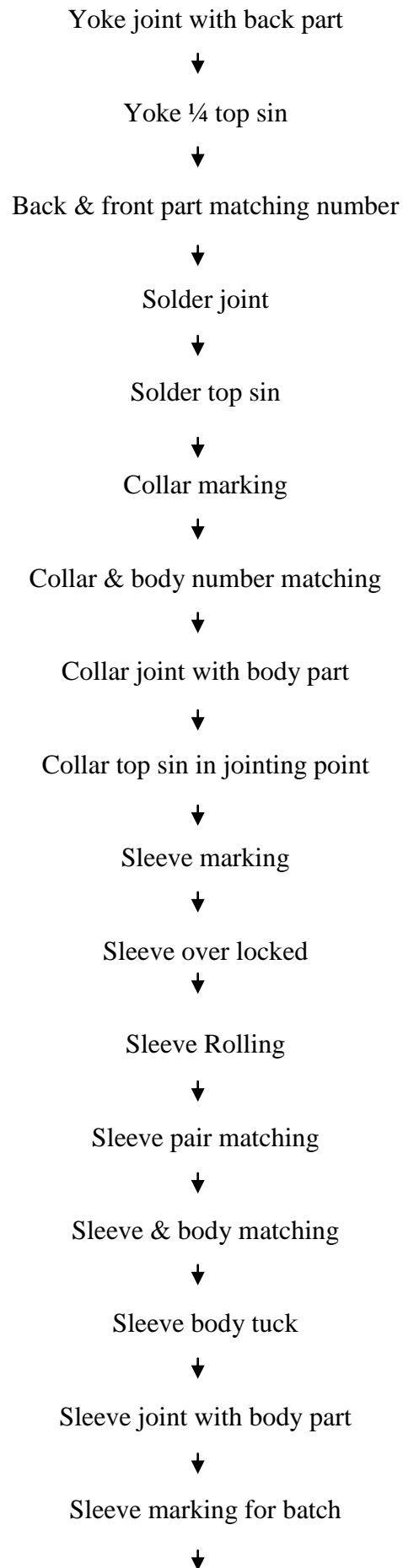


### **3.8.5 Polo- Shirt Sewing Sequence**









Sleeve batch joint (left & right side)



Body marking for batch



Batch joint with body part



Label make



Label Iron



Main label joint in back side



Sleeve opening tuck



Body hem sewing



Care label sewing



Side joint



Band tuck



Band tape joint



Band top sin



Sleeve chap tuck



Inspection

**Line Balancing of Basic T-Shirt**

no. of m/c

Shoulder joining-(O/L)=

1

Side cutting -(scissor)=

1

Neck making-(P/M)=

1+1

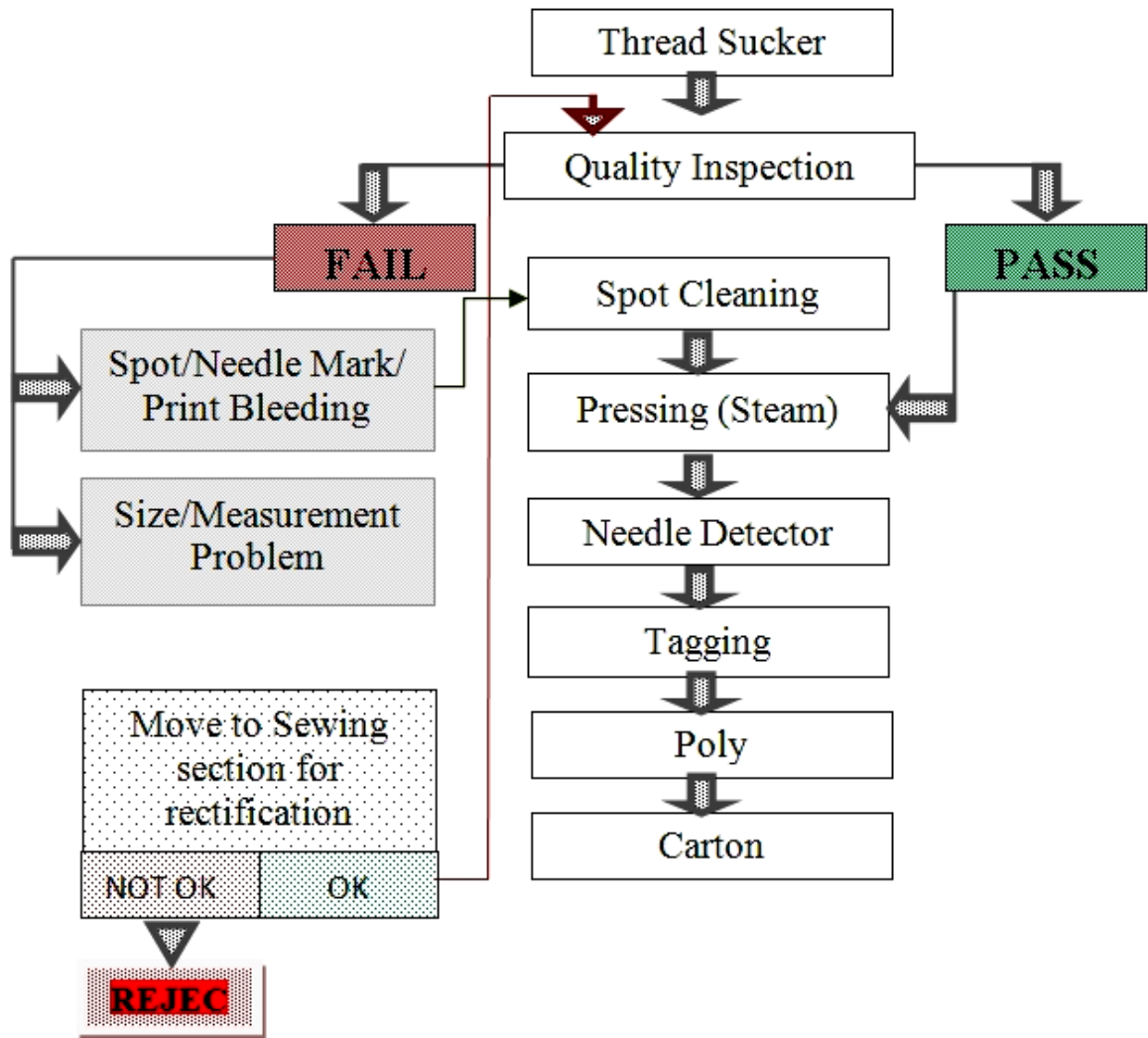
Neck Joining –(O/L)=	1+1
Label attaching (P/M)=	1+1
Piping (feed of the arm)=	1+1
Sleeve hem (F/L)=	2+1
2m/c Sleeve joining(O/L)=	3
2m/c Side seam (O/L)=	2
2m/c sleeve tuck (P/M)=	1
2m/c Bottom hem (F/L)=	2



**Fig: Sewing section**

### 3.9 Apparel Finishing

#### 3.9.1 Sequence of Finishing Section



#### 3.9.2 Machine Description of Finishing Section

M/C TYPE	BRAND	AMOUNT	ORIGINE
Needle detector	HASIMA	2	JAPAN
Rib Cutter (3way)	CALIFORNIA	2	USA
Rib Cutter (Single)		2	TAIWAN
Band Knife	EASTMAN	2	JAPAN
Cutting mchine (Straight Knife)	KM	10	JAPAN

Vacuum Table	NAOMOTO	50	JAPAN
Heater less Iron	NAOMOTO	50	
Label Cutter & Folder		1	
Snap Button Machine	YKK	10	GERMANY
Thread Sucker	NAOMOTO	2	JAPAN
3 Needle, 5 thread Cylinder bed interlock Machine with Fabric Trimmer	PEGASUS		SINGAPUR



Fig: Thread sucker



Fig: Spot Cleaning



Fig: Inspection & pressingtable



il In

**Fig: Needle detector**



**Fig: Tagging**



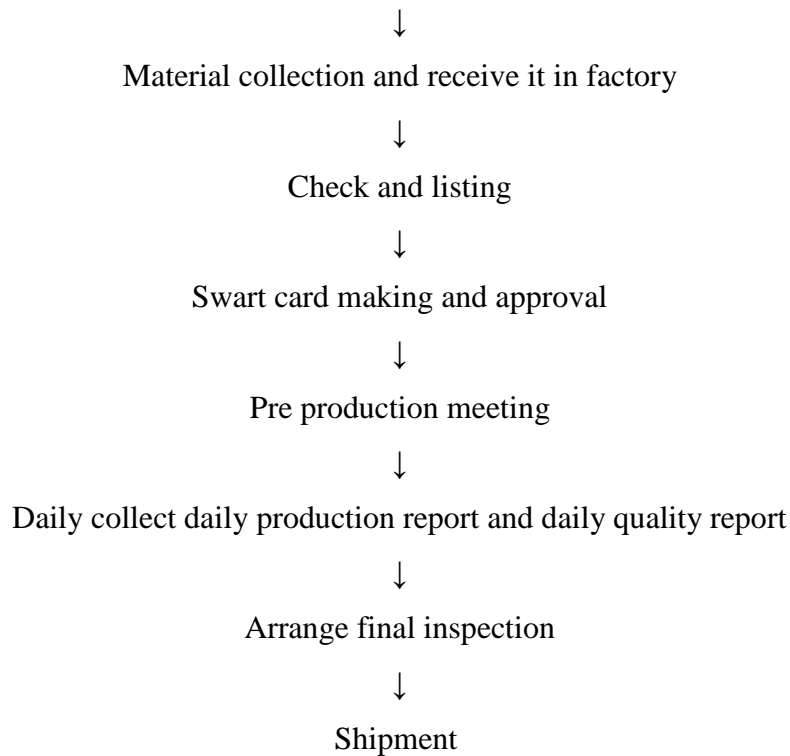
**Fig: Poly**

**Fig: Carton**

**Z**

### **3.10.1 Process flow chart of merchandiser**





### 3.10.2 Objects of Merchandising

Merchandising denotes all the planned activities to execute and dispatch the merchandise on time, taking into consideration of the 4 Rs to replenish the customer.

**Right Quantity:** To dispatch right quantity of product what buyer ordered.

**Right Quality:** It should be with right quality as accepted both parties.

**Right Cost:** Everybody wants more from what they are paid.

**Right Time:** No one wants to wait idle even in a Restaurant. Keeping delivery schedule is mandatory.

### 3.10.3 Qualities of Merchandiser

**Planning Capability:** Merchandiser should be capable of planning, based on the planning the order is to be followed. If the planning is not done properly it will directly affect the delivery time of the order.

**Decision making:** For a Merchandiser, decision making power is most important. He should think about the decision to be taken and to act in a right way.



**Communication Skill:** The communication is very much important to promote the business activity. The merchandiser should remember that communication must be lurid and should having face to face conversation with the buyer.

**Loyalty:** Loyalty is an essential character of human beings. Especially for the business people like merchandiser it is a must.

**Knowledge about the field:** Merchandiser should have adequate knowledge about the garments, Computer knowledge, and technical knowledge to communicate with different people in the business is a must.

**Co-ordinate & Co-operate:** Merchandiser is the person who is actually co-ordinate with the number of departments. To Co-ordinate with different people in the industry he should be co- operative.

**Monitoring ability:** Merchandiser should monitor to expedite the orders.

**Other qualities:** Education, Experience, Situational Management, Ability to Evaluate, Dedication, Knowledge of expediting procedures.

### **3.10.4 Functions of Merchandisers**

1. Execution of Sample orders
2. Costing.
3. Programming.
4. Yarn Procurement Arrangements.
5. Production Scheduling (or) Route CARD Drafting.
6. Accessories arrangement (order placing follow-ups).
7. Approval of various processors's sewing operations and finishing processes.
8. Pattern approval (or) Dummy size set approval.
9. Size set approval.
10. Preproduction sample follow-ups.

11. Pilot run inspection.
12. In process inspection.
13. Production controlling.
14. Identifying shortages and make arrangements for the shortages.
15. Shortage quantity and quality following quality control procedures.
16. Following quality assurance procedures.
17. Maintaining the junior's activities of in house and sub-contractor units.
18. Buyer communication.
19. Communication with production units, processing units and other third party's (vendors).
20. Proper reporting.
21. Highlighting to the management.
22. Record maintenance (Records pertaining to merchandising).
23. Developing samples.
24. Placement of orders.
25. Taking measures for consistent production.
26. Taking preventive actions to maintain the targeted Performance level in all areas of merchandising.
27. Attending meetings with superiors and furnishing the required details about merchandising.

### **3.10.5 To Calculate the Knit Fabric Consumption Following Information is Required**

1. Body length of the garment in cm. Suppose it is - 70 cm+5cm (Sewing allowance)=75cm
2. Sleeve length of the garment in cm. Suppose it is 20 cm+5cm (Sewing allowance)=25cm
3. 1/2 Chest width in cm. Suppose it is 48 cm+2cm (Sewing allowance)=50cm
4. Armhole circumference in cm. Suppose it is-40cm+2cm (Sewing allowance)=42cm
5. Fabric GSM. Suppose it is 180 gsm
5. Percentage of fabric wastage Suppose it is 10%

## FORMULA FOR FABRIC OF KNIT GARMENTS CONSUMPTION

$\{(Body\ length + Sleeve\ length + Sewing\ Allowance) \times (1/2\ Chest + Sewing\ Allowance)\} \times 2 \times GSM \times 12 / 10000000 + Wastage\%$

Here,

Body Length = in CM

Sleeve Length = in CM

Chest/Bottom (most widest part) = in CM

GSM = gm/m<sup>2</sup>

### **Example for 1 dozen garments:**

$\{(Body\ length + Sleeve\ length + Sewing\ Allowance) \times (1/2\ Chest + Sewing\ Allowance)\} \times 2 \times GSM \times 12 / 10000000 + Wastage\%$

$= \{(73 + 19.5 + 10) \times (52 + 4)\} \times 2 \times 160 \times 12 / 10000000 + 10\%$

$= (102.5 \times 56) \times 2 \times 160 \times 12 / 10000000 + 10\%$

$= 5740 \times 2 \times 160 \times 12 / 10000000 + 10\%$

$= 22041600 / 10000000 + 10\%$

$= 2.20416 + 10\%$

$= 2.424576$

$= 2.43\text{ kg per dozen.}$

### **3.10.6 Trims used in Montex**

Trims cover all the items used in the garment except the basic fabric. There are hundreds of items used to manufacturer the garment's, by the customers.

1) Zipper / fastener:

- a. Teeth : Nylon, Vislon, Metal.
- b. Color : Tape color, Teeth color
- c. Size : #3, #5, #8 etc.
- d. Length : As per requirement 18cm,72cm
- e. End : Close end (C/E),open end (O/E)
- f. Slider : One way, Reversible



2) Sewing thread:

- a. Shade, Color fastness etc.
- b. Tensile strength, Elasticity, Shrinkage, Moisture Regain, Abrasion, Resistance etc.
- c. 30s, 60s, 20s/2, 40s/9 etc.
- d. Labels: Main, Size, Care, Content, Price, Patch etc.



3) Button:( 1.2-2.5 dollar/grows (144 pcs=1 grows)

40 Line =1 inch =2.54 cm=25.4 mm

1 line =0.635MM



- 4) Elastic: Cotton, Polyester etc.
- 5) Eyelet: Antique Matching etc
- 6) Velcro: Hook and Pile
- 7) String/ cord: Cotton, polyester etc.
- 8) Tag pin
- 9) Plastic clip
- 10) Sticker: Hook and pile
- 11) Hanger: 1.65-2.50 dollar
- 12) Scotch tape
- 13) Carton: 3ply, 5ply, Size(L,W.H)-- 65 cent- 1.5 dollar
- 14) Gum tape
- 15) Blister Bag
- 16) Poly bag : 30cent-1dollar
- 17) Tags :Price tag, Hand tag
- 18) Price Tag: 10 cent-60

### **3.10.7 Packing Accessories used in Montex**

The Accessories which are used for garment packing during garment shipment to buyer are called packing accessories. Packing accessories are depended on garment packing and folding etc which is instructed by buyer.

Poly bag, packing board, tissue paper, hanger, scotch tape, gum tape, carton etc are part of packing accessories.

Packing should be varying (as per buyer garment packing instruction) in different orders as per instruction of buyer garments packing. , The number of one carton garments it is weight on depend carton quality.

Understand quality of carton follow 3 ply, 5 ply, and 7ply.

The number of carton is high ply number it is very much it is hard and strong. The sea freights depend on dimension of the export carton and the air freights depend on dimension of the export carton or gross weight of the carton. Here is attached some documents for packing-

### **3.10.8 Letter of Credit (LC)**

The whole system of merchandising is depending on L. C. It is the main stem of this trade.

#### **Types of LC**

Various types of L.C. are present in business system. Some recognized processes are

- 1) Master / Mother L /C
- 2) Back to Back L/C
- 3) SIGHT L.C

#### **Documentation for Opening LC:**

Before preparing necessary documents you must collect Indent /Proforma invoice. Otherwise, you will not be able to fill up the L/C application form. So, obtain an indent/proforma invoice as per the category of your L/C prior to filling up the forms.

#### **Documents of LC:**

- ❖ L/C application form
- ❖ L/C form (Letter of Credit Authorization application form)
- ❖ IMP form
- ❖ TM form
- ❖ Agreement form

❖ Charges of Documents

❖ Guarantee form

After verifying and signing, the following documents should be submitted to the bank.

- Trade license (valid)
- Import registration certificate(IRC)
- Income tax declaration or a TIN
- Membership certificate
- Memorandum of Association

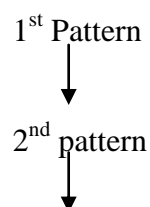
#### **Documents Are Required to Open a Cash LC:**

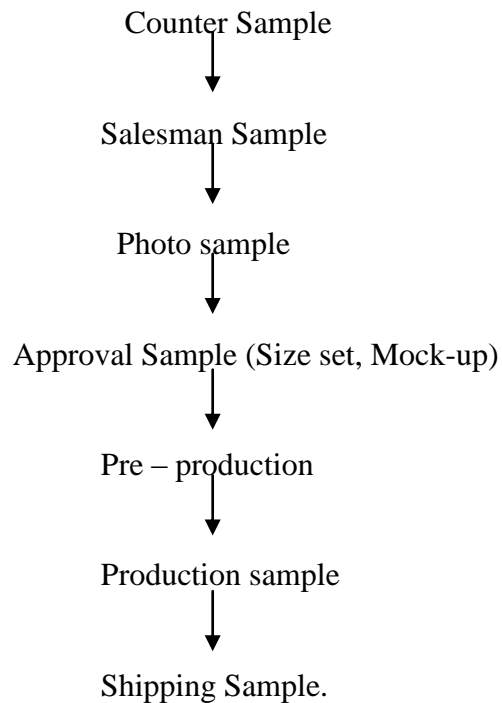
- a) A prayer for opening L/C
- b) L/C application form
- c) Indent / proforma invoice
- d) L/C form
- e) IMP
- f) Charges of Documents
- g) Insurance cover note

#### **Opening Process of Back to Back LC:**

1. A prayer for opening L/C
2. L/C application form
3. Indent / proforma invoice
4. L/C form
5. Original Export master L/C
6. Insurance cover note

#### **3.10.9 Sequence of Sampling of Montex**





### **First pattern**

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

### **Second pattern:**

Usually designer / developer always ask for some Change to the first pattern.

Second pattern is made as per comments.

### **Salesman sample:**

Sample is made up when price is confirmed and orders are on speculation, usually in L size in all color combination of expected order. Buyer held a meeting with its customer and records their response on order quantity per color, size etc. and finally place order to their vendor:

### **Photo sample:**

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



**Approved sample:**

In any discrete period of time, whenever it required any revision in the sample, a new sample is made (sometimes mock up is workable too) as per new specification.

**Size-set sample:**

Consists of 1 pc from each size for each color combination

**Mock-up sample:**

Any part of the garment to make for particular purpose, not complete garment.



**Pre-production sample:**



When material for bulk production arrived, factory makes a sample with the actual material and sends to buyer.





**Production sample:**


It is a reference to the buyer that bulk is being produced as per specifications. Buyer wants to be assured that correct material is sourced and line workmanship confirmed with the quality level.

**3.10.10 Care Instruction for Garments**

Heat Setting	
<i>Icons:</i>	<i>What it means:</i>
	Set dryer at any heat.
	Set dryer at High heat.

	Set dryer at Low heat.
	Do not dry (used with do not wash).


Special Instructions	
<i>Icons:</i>	<i>What it means:</i>
	Line dry/hang to dry - hang damp from line or bar and allow to dry.
	Drip dry - hang wet on plastic hanger and allow to dry with hand shaping only.
	Dry flat - lay garment on flat surface.
	Dry in the shade.

Bleach Symbols	
<i>Icons:</i>	<i>What it means:</i>
	Use any bleach (when needed).



Use only non-chlorine bleach (when needed).

Iron - Dry or Steam	
<i>Icons:</i>	<i>What it means:</i>
	Iron - Ironing is needed.
	Iron using High temperature setting.
	Iron using Medium temperature setting.
	Iron using Low temperature setting.
	Do not iron or press with heat.
	No steam - iron without using steam.
Dry-clean - Normal Cycle	
	Dry-clean.
	Dry-clean using any solvent.
	Dry-clean using any solvent except trichloroethylene.
	Dry-clean using Petroleum solvent only.

	Do not dry-clean.
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### 3.10.11 General Inspection Instruction for Quality Inspectors

- Accessories check should be as per approved Trim card.
- Check properly preliminary output/Production with approved counter sample.
- Stitching per inch (SPI) must be 13/14.
- All process stitching tension should be properly adjusted.
- Uneven Neck shape not accepted Neck shape S /B Nice& more round.
- Both side neck line (V-NK/POLO SHIRT) S/B Even.
- Placket with S/B Even & Straight, Slanted Placket Box not accepted.
- Shoulder, Sleeve length, Sleeve opening, Underarm & Side seam must be even.
- Armhole, Side seam & Body Hem (Bottom) shape should be counter sample shape.
- Garments free from any kind of spot.
- Any kind of fabric defect twist garments not accept.
- Alter, Rejection, Spot Fabric defect must be kept separately.

#### Four point system

Defect Length	Assigned Points
0-3 inch	1 point
3.1-6 inch	2 point
6.1-9 inch	3 point
>9.1 inch	4 point
Hole	Points
Less or Equal to 1 inch	2
Larger than 1 inch	4

$$\text{Quality (points per 100 square meter)} = \frac{\text{(Total point X GSM)}}{\text{(Roll weight X 10)}}$$

**STANDARD:**

1	2	3
< 40	41-79	>80
OK	ASK FOR RECTIFICATION	REJECT

Note: Few Buyers also allow till 60 point as 2<sup>nd</sup> quality product/for rectification.

**Basic Information Relevant to Quality**

- 1) Measurement with Technical Spec.
- 2) Style Description
- 3) Fabrics Description
- 4) Fabrics width /weight
- 5) Washing Shrinkage if any

**3.10.12 Commercial Invoice's**

This is the document that you use to collect money from your buyer. Therefore, it must contain the correct unit price with the indication of FOB the shipping port, or CIF or CNF at the shipping destination. If the terms used are FOB the shipping port, then it is simple and easy.

**Bill of Lading:**

It is a major document if the goods are dispatched by sea.

The document represents:

1. A formal receipt for the goods
2. The evidence of the contract of carriage of the goods between the shipper of the goods and the shipping company
3. The document of title to the goods

### Types of B/L:

Straight Bill of Lading	Non negotiable bill of lading consigned directly to importer cosigned directly to third party
Memo Bill of Lading:	Needed for documents & revenue purpose. Short shipment & Advance / roller CGO.
Express Bill of Lading	Non negotiable bill of lading consigned directly to third party Hard copy is not required by shipper.
Sea—Way Bill of Lading	Non negotiable bill of lading Needed short transit time in house transportation between Multinational companies without L / C

### Shipping Terms:

- **Consignee**
- **FCL (full container load)**
- **Shipper**
- **LCL (less container load)**

### 3.10.13 Shipment

When we refer to documentation in the process of export, we usually refer to the preparation of documents which the shipper uses to collect money for the goods shipped.

- 1) The buyer's bank who has open the L /C to you if it is L /C payment, otherwise you will have delay in receiving the proceeds of the goods you have shipped.
- 2) The customs, otherwise you will have delay in clearing the goods through customs.
- 3) your buyer, giving him the correct information in all respect, particularly all the packing details in order to enable him to distribute the merchandise correctly to the retail stores.

- ❖ **C&F (cost and freight)**
- ❖ **CIF (cost, insurance, freight)**
- ❖ **CM=** This refers to the manufacturing cost and this term means "cut and make".
- ❖ **CMQ=** This term means "cut, make and quota" and is similar to 'CM'

- ❖ **CMT** = The term means "cut, make and trim".
- ❖ **CMTQ**= The term means "cut, make, trim and quota".
- ❖ **FOB**= Free On Board
- ❖ **FOB Airport (FOA)**= This is similar to the term FOB
- ❖ **Export License**= In Hong Kong, export licences are needed for all garments and textile products. The licences are issued by the Trade Department

**Packing List:** This is a document that indicates the contents of each individual carton/ package in the container. The packing list includes the cubic measurement of the cartons/package, the weight, the number of cartons/packages, the breakdown of the goods by size/color/quantity.

### 3.11WTP and ETP

#### 3.11.1 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**

### 3.11.2 Water Treatment Plant (WTP)

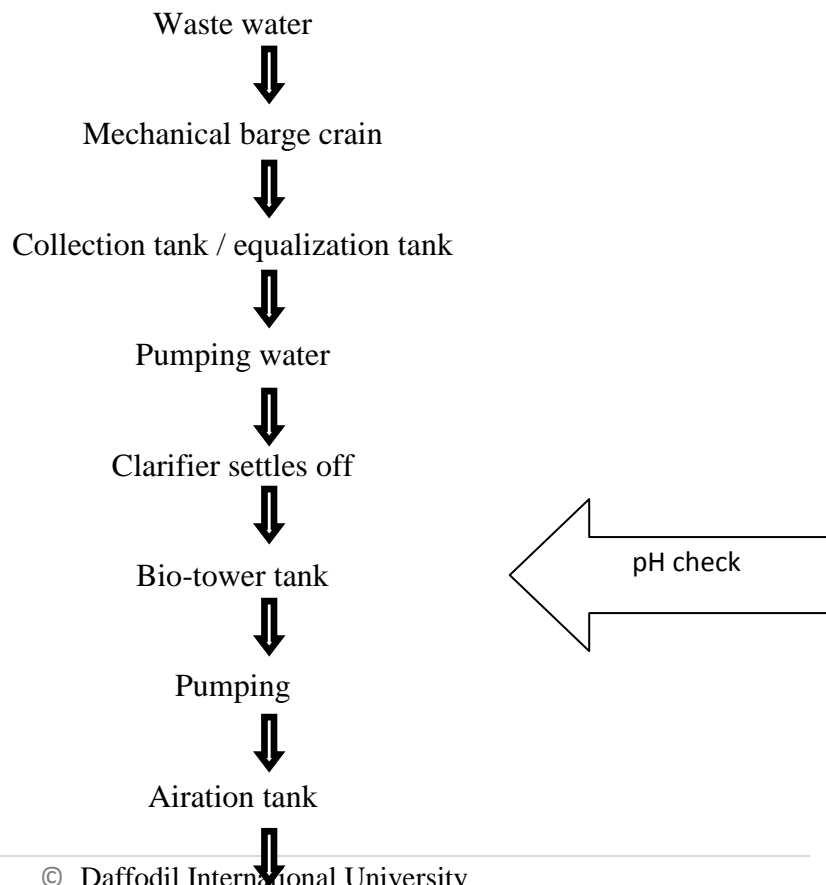
Water for a textile plant may come from various sources. But this water cannot be used directly in textile processing because it contains various salts. These salts are mainly the carbonates ( $\text{CO}_3^{2-}$ ), Hydrogen carbonates or bi-carbonates Sulphates ( $\text{SO}_4^{2-}$ ) and Chlorides (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

### 3.11.3 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	:	80m <sup>3</sup> /hr
Cost	:	Tk. 2.25/ Kg

### 3.11.4 Flow Chart for ETP





Lamallah (Secondary Clarifier)

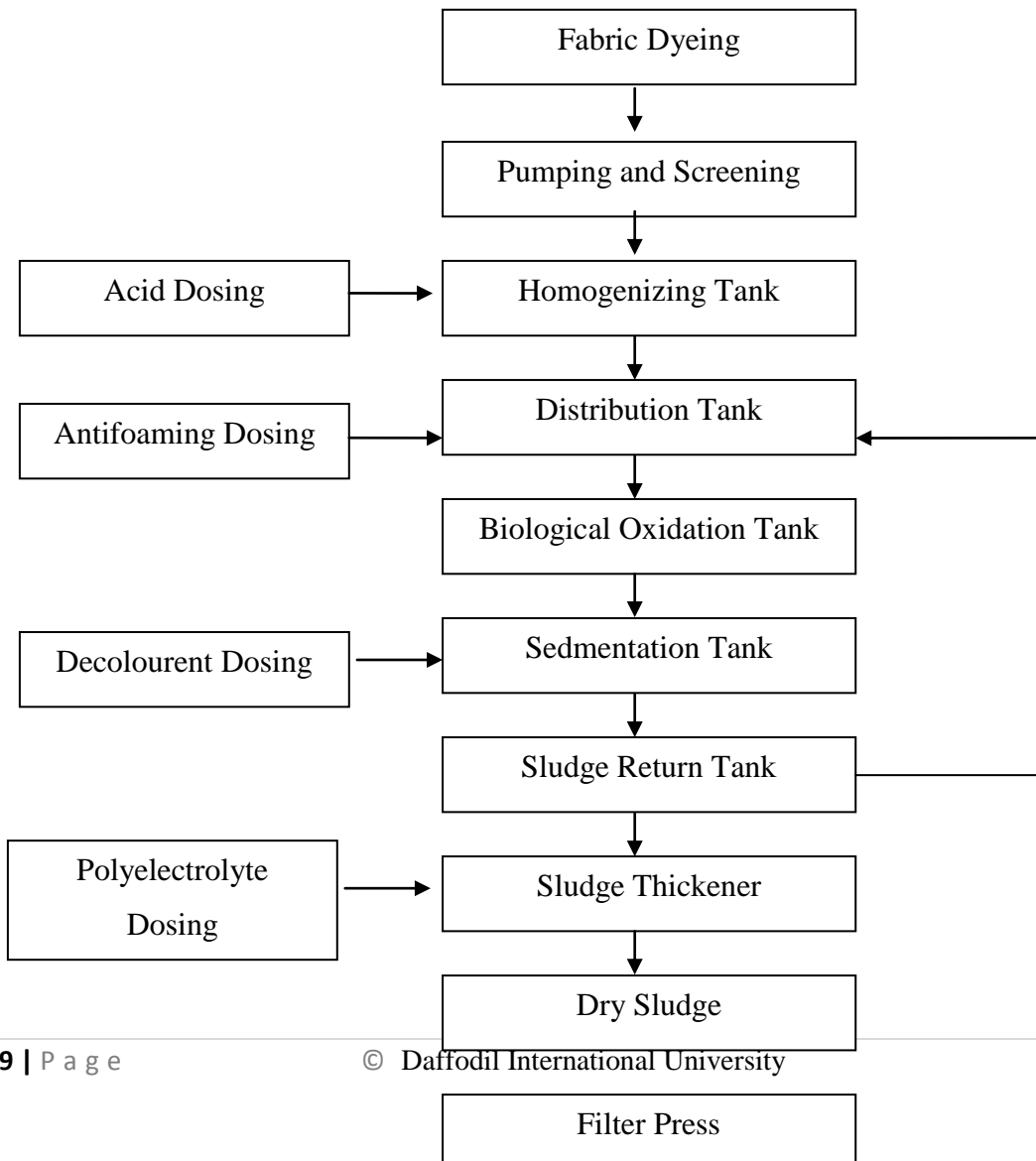


Dispose to environment



Fig: Surface of ETP

### 3.11.5 Process Flow of Biological Effluent Treatment Plant



### 3.11.6 Function of Different Units Of Biological Effluent Treatment Plant (ETP)

- **Screening unit:** It works like a filter. By filtering waste water, it removes threads, pieces of fabrics, small metal pieces etc. In this unit a rotating brush is used for clean the pores of screen.
- **Storage and Homogenization Tank:** Different waste water from various processes is stored and makes a homogeneous mixture by mixing different concentrations of waste water.

#### •Neutralization tank:

Neutralization of waste water is performed by dosing 98% H<sub>2</sub>SO<sub>4</sub> as required to control the pH

Of waste water pH range 6.5 to 7.5.

#### •Distribution tank:

It distributes the water to the biological oxidation tank. Continuous aeration is supplied here. Antifoam is dosed here to control the foaming in the oxidation tank.

#### •Biological oxidation tank:

It is the heart of E T P. The entire harmful chemicals are damaged here by breaking their bonds. This is done by bacteria.

- Temperature : 35° to 37° C
- PH (Maximum) : 6.5
- Dissolved oxygen : 4 PPM

#### •Sedimentation Tank / Biological feeding tank:

Treated water is overflowed here from oxidation tank. Decolourant is used here to destroy the color of waste water.

#### •Settling tank / Sedimentation Basin:

A tank or basin in which waste water is held for a period of time, during which the heavier solids settle to the bottom and the lighter material will float to the water surface.

• **Sludge Thickener bed:**

Here sludge is dried which is used as good fertilizer as well as fuel of brick field. Sludge is dried under the sunlight.

**3.11.7 Chemicals used in ETP**

- Ferrous-Sulphate-( $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ )
- Sulphuric-Acid ( $\text{H}_2\text{SO}_4$ )
- Lime
- Polymer
- Sodium-Hypo-Chloride ( $\text{NaOCl}$ )
- Urea-Fertilizer
- TSP
- De-color

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

**$\text{H}_2\text{SO}_4$ :**

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.

### Product Quality Checked:

- Biological Oxygen Demand (BOD)
- Chemical Oxygen Demand (COD)
- Total suspended solids
- Total dissolved solids
- Color
- pH

### Effluent Analyzing Report:

Parameter	Unit	Quantity	St. Value
PH	Mg/l	7.5	6-8
COD	Mg/l	0.8	250-300
BOD	APHA/Pt.Co	21	29-60
Color	Mg/l	200	220-250
Phosphate	Mg/l	8.25	5-15
Sulphate	Mg/l		1000
Ammonia	Mg/l	1	5-10
Chloride	Mg/l	55	500-600
Nitrate	Mg/l	1	10-15
TSS	Mg/l	70	60-80
Chlorine	Mg/l	.25	1
Nitrite	Mg/l	1580	>1
Sludge (Wet	Mg/l		800

**Remarks:** Waste water from processing industries e.g. Dyeing, Printing, Finishing and washing causes great harmful effect on our environmental, As a result agricultural land loses its fertility, natural water becomes polluted aquatic life is destructive and crops are damaged.

So, it is important to control ETP plan.

### 3.12 Utility

#### 3.12.1 Source of Utility

Electricity	PDB & Generator
Gas	TITAS
Water	Pumps
Compressed air	compressor
Steam	Boiler

#### 3.12.2 Electricity

Gas Generator is used for supplying electricity for the Production & office of the **Montex Fabrics Ltd...**

Total power produced by Gas Generator - 945 KW = 1134 KVA

Factory (Dyeing & Knitting) Power Needed for Installation - About 1200 KW

Factory (Dyeing & Knitting) Power needed at running stage - About 720 KW

Power Needed for Office - About 250 KW

#### 3.12.3 Boiler

Boiler is mainly used to produce and deliver steam to different section as required. In Montex Knit Composite Ltd. four boilers are used to produce and deliver steam to different section.

#### Specification:

1. Name	REVOTHERM
Nos.	02
Type	Fire tube
Capacity	6 tons / hr
Working Pressure	8Kg
Origin	India

2. Name	BORDERER
Nos.	01
Type	Fire tube
Capacity	4.5 tons / hr
Working Pressure	8 Kg
Origin	Scotland
3. Name	SHELLMAX
Nos.	01
Type	Fire tube
Capacity	4 tons / hr
Working Pressure	8Kg
Origin	India



Fig: Boiler

### 3.12.4 Specification of the Boiler

Technical Details	Boiler Data
Type	Fire tube boiler
Manufacturer	OMNICAL BORSIG ENERGY
Model no.	DDHI 60-10
Manufacturer country	Germany
Year of construction	2002
Thermal capacity	3.9 MW
Maximum steam out	6 ton/hr

### 3.12.5 Compressor

Compressor is mainly used to deliver compressed air to different section as required. In Montex Knit Composite Ltd. five compressors are used to produce and deliver compressed air to different section.

#### Specification

Name	:	BOGE
Nos	:	05
Capacity	:	774 It air compression/sec
Origin	:	Germany



**Fig: Air compressor**

**The source of Gas is TITAS GAS LTD.**

The gas is supplied to gas generator or different section (Boiler- for heating water) from fee main line of the TITAS GAS LTD.

### 3.12.6 Specification of Gas Generator

Technical Details	Generator Data
Type	Gas generator
Manufacturer	Cummins power generation
No. of gas generator	03
Model no.	315 GFBA

Manufactured country	England
Year of construction	2002
Rated power	Prime
Rated	315 kw
Power factor	.8
Voltage	400
Rated current	568
Frequency	50
Rotating speed	1500
Battery volt	24
Control system	PCCP
Site altitude before derate	800 MASL
Site ambient temp. before derate	40°C



**Fig: Gas generator**

### **3.13 Maintenance**

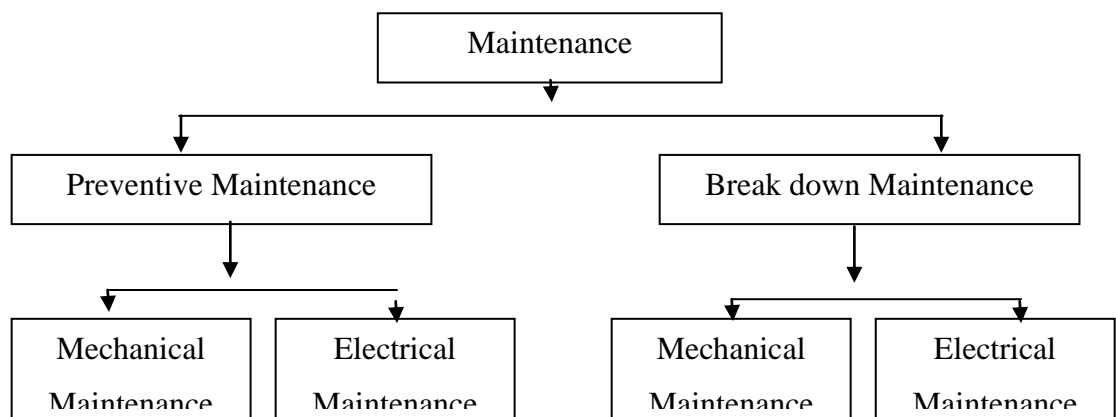
#### **3.13.1 Objectives of Maintenance**

- To Keep the factory Plants, equipments, Machine tools in an optimum working condition.



- To ensure specified accuracy to product and time schedule of delivery to customer.
- To keep the downtime of Machines to the minimum thus to have control over the production Program.
- To Keep the Production cycle within the stipulated range.

### 3.13.2 Classification of Maintenance



### 3.13.3 Preventive Maintenance

In **Montex Fabrics Ltd.** the Preventive Maintenance is a predetermined routine activity to ensure on time inspection or checking of facilities to uncover conditions that may lead to Production break downs or harmful depreciation.

### 3.13.4 Break down Maintenance

In this case, repairs made after the equipment is out of order and it can not perform its normal functions.

### 3.13.5 Maintenance Tools & Equipments and their Functions

#### 1. Combination tools (Spanner)

Function: Tightening & Loosening of Nuts & bolts

## **2. Socket Ratchet set**

Function: Tightening of Nuts & bolts

## **3. Slide Range**

Function: Tightening & Loosening of Nuts & bolts

## **4. Pliers**

Function: Tightening & Loosening of Nuts & bolts

## **5. Pipe thread Cutting Tools**

Function: To Cut the thread in Pipe.

## **6. Bearing Puller**

Function: To assist the Opening of bearing from shaft.

## **7. Pipe Range**

Function: Tightening & Loosening of Pipe Joint

## **8. Pipe Cutting Tools**

Function: For Pipe Cutting.

## **9. Hole Punch**

Function: Punching the hole.

## **10. Divider**

Function: For circle marking on metal & wood

## **11. Easy Opener**

Function: To open the broken head bolt

## **12. Heavy Scissor**

Function: Cutting of gasket & steel sheet.

## **13. Oil Can**

Function: Oiling of moving Parts.

**14. Drill M/C and Drill bit.**

Function: For Drilling.

**15. Grease Gum.**

Function: For greasing of moving Parts of M/C.

**16. Girding M/C**

Function: For grinding & Cutting of mild steel.

**17. Welding M/C**

Function: For welding & Cutting.

**18. File**

Function: For Smoothing the Surface.

**19. Hammer**

Function: For Scaling & right angling.

**20. Hacksaw blade.**

Function: For metal Cutting.

**21. Handsaw (wood)**

Function: For wood Cutting.

**22. Grinding Stone.**

Function: For smooth finishing

**23. Grinding Paste**

Function: For easy Cutting of metal

## **4. IMPACT OF INTERNSHIP**

#### **4.1 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

#### **4.2 Batch Section**

- I. Learned about different batch size
- II. Understood the considerable points
- III. Learned about fabric fault identification

#### **4.3 Lab Dip Section**

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

#### **4.4 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
- IV. Learned about digitizing screen in dyeing m/c

#### **4.5 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

#### **4.6 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

#### **4.7 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

#### **4.8 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

#### **4.9 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

#### **4.10 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

#### **4.11 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

#### **4.12 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

#### **4.13 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.

## **5. CONCLUSION**

**Montex Fabrics Ltd.** is a well known knit composite textile industry in Bangladesh since 1991. We are very proud to take our training in such a leading industry

To speak the truth it's the 'Industrial Training' which visualizes our four years academic course in 2 month only. It helps us to understand the complicated steps of knitting, dyeing, printing, sewing, merchandising and such difficult topics of Textile which we just learn by heart in our academic session in the department. So we thank **Montex Fabrics Ltd.** for the knowledge we gathered from this training will of course be the assets for our future life.

**Montex Fabrics Ltd.** has an ethical industrial culture in most point of views. They are very helpful to each other as well as to the trainees. We have got an immense support from all the members of **Montex Fabrics Ltd.** & expect its onward development.