



Faculty of Engineering

Department Of Textile Engineering

REPORT ON Industrial Attachment

At

R.K. Group of Industries

Chowdhury Bari, Godnyle, Narayangong-1432, Bangladesh

Course Title: Industrial Attachment

Course Code: TE-410

Submitted By

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This Report presented in partial fulfillment of the Requirement for the Degree of Bachelor of Science in Textile Engineering.

Advance in Apparel Manufacturing Technology

Duration: From 10th January 2018 to 10th March 2018

Acknowledgement

First of all we are grateful to Allah who gives us sound mind & sound health to accomplish **Industrial Attachment** at **RK Group of Industries** successfully.

We are also grateful to our supervisor **Mst. Murshida Khatun**, Senior Lecturer, Department of Textile Engineering, Faculty of Engineering, Daffodil international University. Her endless patience, scholarly guidance, continual encouragement, energetic supervision, constructive criticism, valuable advice, reading many inferior draft and correcting these at all stages have made it possible to complete this project.

We would like to give special thanks to the supervisors, technicians, operators and all other staffs of **R.K. Group of Industries**, who were most cordial and helpful to us during internship.

We are also thankful to our all teachers, lab assistant, register sir, coordinators and all the employees of Daffodil International University. We are highly delighted to express our regards & gratitude to honorable Head **Prof. Dr. Md. Mahbul Haque** for providing his best support to us.

Finally, we would like to express a sense of gratitude to our beloved parents and friends for their mental support, strength and assistance throughout completing industrial attachment.

Declaration

We hereby declare that the work which is being presented in this report entitled, “Industrial Attachment at R.K. Group of Industries ” Is original work of our own, has not been presented for a degree of any other university and all the resources of collected information for this report have been duly acknowledged.

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Letter of Approval

April 15, 2018

To

The Head

Department of Textile Engineering

102, Shukrabad, Mirpur Road, Dhaka 1207

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

Dear Sir,

I am just writing to let you know that this Industrial Attachment in “R.K.Group of Industries” has been prepared by the student bearing ID 142-23-3894 is completed for final evaluation. The whole report is prepared based on the proper investigation and information in R.K. Group of Industries. The student were directly involved in their industrial attachment report activities.

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

Yours Sincerely



.....
Mst. MurshidaKhatun

Senior Lecturer,

Department of Textile Engineering

Daffodil International University

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Chapter-1

Executive Summary

1.1 Executive Summary

This report presents a conception of Textile sector especially of a knit composite industry and tries to clarify the overall processes required to complete a garment. Two months long training is not enough to capture all the information related to but it is possible to overview of all the departments. “R.K. Group of Industries” in where we try to gather information about all the departments. The factory has a nice system for the internship students that are the training schedule provided by the authority. There are several departments in R.K. Group of Industries among them knitting, dyeing, printing and garments are the major ones. There are also other departments those act as supporting of them. It describes about the activities of each departments and the relation among the departments. Training schedule is prepared in such a way that helps a learner to know that to produce a garment which department works first and correspondingly which works at last. This paper includes from where order is received and to where it is supplied and how a large scale of products is produced within a very short period of time. Different types of order are running on the same time on a same floor with different types of garments from several buyers. But there is no miss match of any product except some cases which are removed by inspection. This paper concludes by identifying some important information about different department that help the factory to grow up quickly with large amount of profit with environment friendly technologies. This report may be a guideline for other small industries to become large in size and for students or other people to learn a little about a knit composite industry without visiting. We have started our 2 months internship in 10th January 2018 and have successfully completed in 10th March 2018.

Chapter-2

Information about Factory



Fig: 2.1 R.K. Group of Industries.

2.1 Basic Information

2.1.1 Company Name &Address

R.K. Group of Industries Chowdhurybari, Godnyl, Narayanngonj -1432

2.1.2 Head Office Address

Chowdhurybari, Godnyl, Narayanngonj-1432

Phone: 7642830, 7642832, 7634565, 7634568, 7642046

Fax: 88-02-7642437

E-mail: rk@rkgroupbd.net

2.1.3 Year of Establishment:

1990

2.1.4 Founder

Mr.Md. Abdull Hamid

2.1.5 History of the Factory

R.K. Group of Industries is one of the leading Textile products manufacturing company in Bangladesh. The Company is managed by a group of dynamic professionals, working proactively in a challenging environment. R.K. Group is committed to provide excellent services to its clients. It is dedicated to focus on quality in order to excel in its performance.

We make every effort to delight our customers by producing best quality Textile products at an optimum price through efficient utilization of available resources. We manufacture and export high quality textile products at an affordable price produced in an environmental friendly process and practicing high level of integrity and fairness in dealing with our stakeholders. Our mission is to provide excellent quality and value added textile products at a competitive price for ultimate satisfaction of our customers.

Since 1980 to till date the Apparel sector of Bangladesh has passed through different huddles & obstacles and now has reached a stage where it can compete with all its competitors in price and quality as well as variety. In this scenario, R.K. Group of Industries is a vertically set up textiles unit, which starts its operation in 1990 from knitting and ships the end product i.e. garments. In a short span of time R.K. Group of Industries has gone from strength to strength to become one of the significant entities into sphere of activity. The factory is well

equipped with high performance machinery and experienced technicians are engaged here to ensure the quality and customer satisfaction.

2.1.6 Compliance Certifications

R.K. Group of Industries realizes the importance of adapting to changes in external environment and keeping the workplace safe and enjoyable for employees to be motivated and productive. Compliance certifications include

- SEDEX
- BSCI
- UKAS

2.1.7 Sister Concern of R.K. Group:

- R.K. Spinning Mills Ltd.
- Parity Fashion Ltd.
- R.K. Fashion Ltd.
- H.K. Apparels Ltd.
- Empire Dyeing Ltd.
- R.K. Textile & Processing Plant.

2.2 General Information about Factory:

Name of Company	R.K. Group of Industries
Legal Status	Private Limited Company
BKMEA membership no	235
Membership Type	Ordinary Member
Year of Establishment	1990
Factory Address	Chowdhurybari, Godnyl, Narayanngonj -1432
Head office address	Chowdhurybari, Godnyl, Narayanngonj-1432 Phone: 7642830, 7642832, 7634565, 7634568, 7642046 Fax: 88-02-7642437 E-mail: rk@rkgroupbd.net
Nature of Business	Completely 100% export oriented knit composite factory.
Name of the Banker	Islami Bank Bangladesh Limited
Contact Person	Kamran Ahmed CEO
Manpower	6800 persons
Total Annual Sales Volume	25 - 50 Million USD
Factory & Building	10000 sqm to 250000 sqm
Certificate	ISO 90001: 2000

Table 2.1 General information of factory

2.2.1 Production capacity

Section	Amount
Knitting	25000 Kg / day
Dyeing	25 tons / day
Dyeing Finishing	28 tons / day
Garments	21000 pcs / day
Printing	48000 pcs / day

Table 2.2 Production capacity

2.2.2 Major Buyers with Their Logos

Brand Name	Logo
Spring Field	
Piazza Italiya	
Takko	

KIK	
LIDL	

Table: 2.3 Buyer of R.K Group of Industries.

2.2.3 Transport Facility

Office Stuff: Bus, Car

Product: Cargo van

2.3 Human Resource & Organization Structure

2.3.1 Organogram

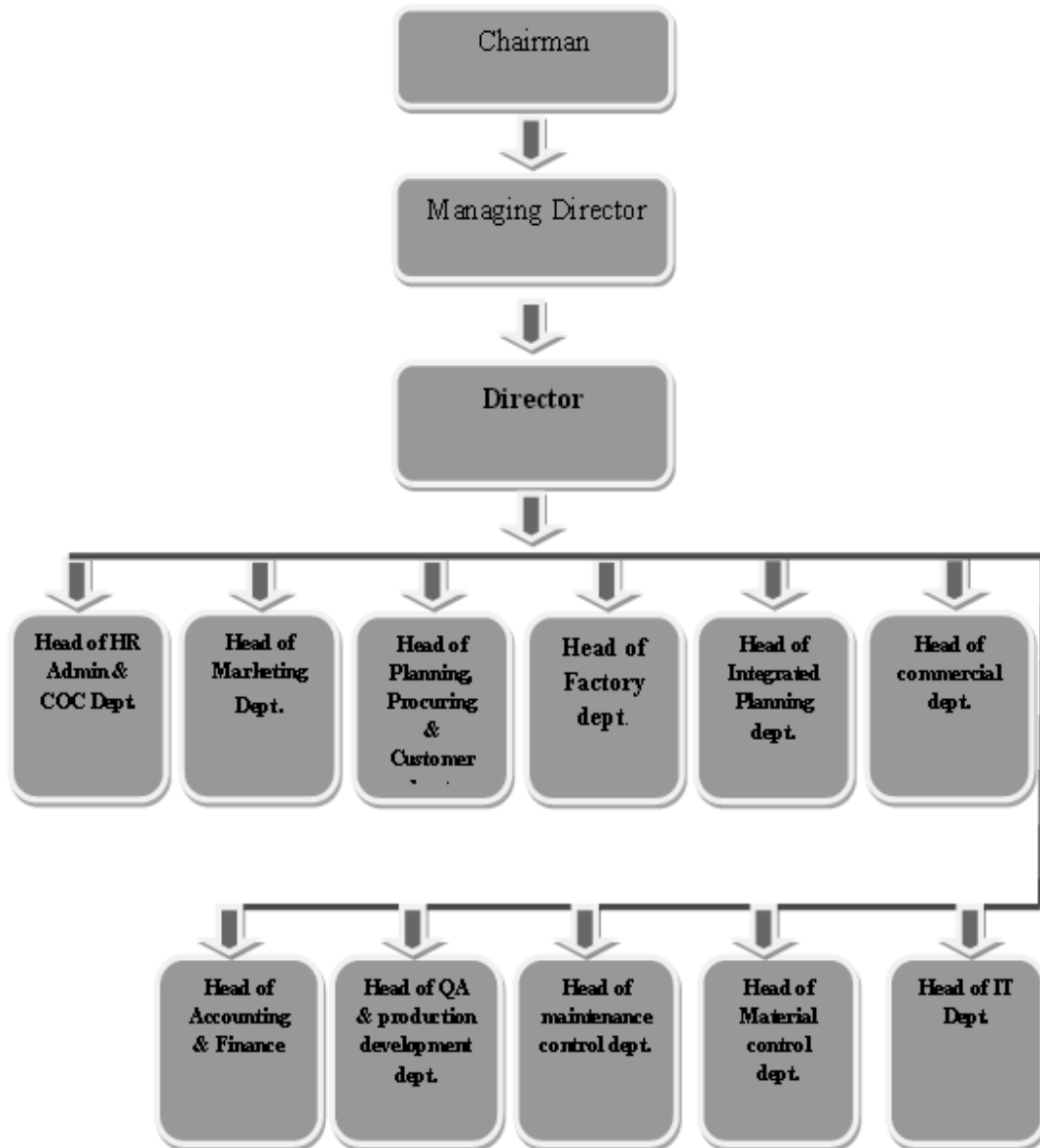


Fig: 2.2 Factory organogram

2.3.2 Total no. of Departments

09

2.3.3 Name of Department

- I. Knitting section**
 - Knitting
 - Inspection
- II. Printing Section**
- III. Dyeing Section**
 - Dyeing
 - Finishing
 - Quality
- IV. Garments section**
 - Sample
 - Cutting Section
 - Sewing Section
 - Finishing Section
 - Merchandising
- V. Maintenance section**
- VI. Utility section**
 - Electricity
 - Gas
 - Boiler
- VII. Store Section**
- VIII. Administration Section**
- IX. Security Section**

2.3.4 Main production

Knitting, dyeing & printing

Spandex, Fleece, S/J, Interlock, Rib, Lacoste, Pk etc.

Garments

- Men/Ladies/Girls/Boys/Infants Knitted Fancy T-shirt,
- Polo Shirt
- Tank Top
- Shorts
- Skirts
- Tank Dress with quality prints

2.3.5 Total no. of employee

Almost 6800

2.3.6 Vision and Mission

Vision: R.K. Group is committed to expose its achievements to the world scenario. That's why we have established ourselves with one-stop source for the global market. realize the need to stake out a competitive segment in the changing global market through Technological Excellence and Human Expertise.

To become confident of satisfying and fulfilling customers` requirement by developing and manufacturing products and offering related services on due time in terms of Quality, Price, Safety, Environmental Impact etc.

To assure complete compliance of the international quality standards along with complete transparency in all aspects of business.

To attain the highest level of competence through continuous development of the Professional Management System followed by best practices.

Our vision is to maintain Quality, Dependability, Commitment, Buyers Satisfaction, Environmental Consciousness, Social responsibility.

Mission: To provide highest satisfaction level to all the stake holders (Customers, suppliers, employees) through continuous improvement of the operational efficiency, cost effectiveness, research & development and investment in peoples benefit to implement and uphold our vision.

Chapter-3

Details of Attachment

3.1 KNITTING SECTION

3.1 Knitting Section



Fig: 3.1. Knitting Section

3.1.2 Organogram

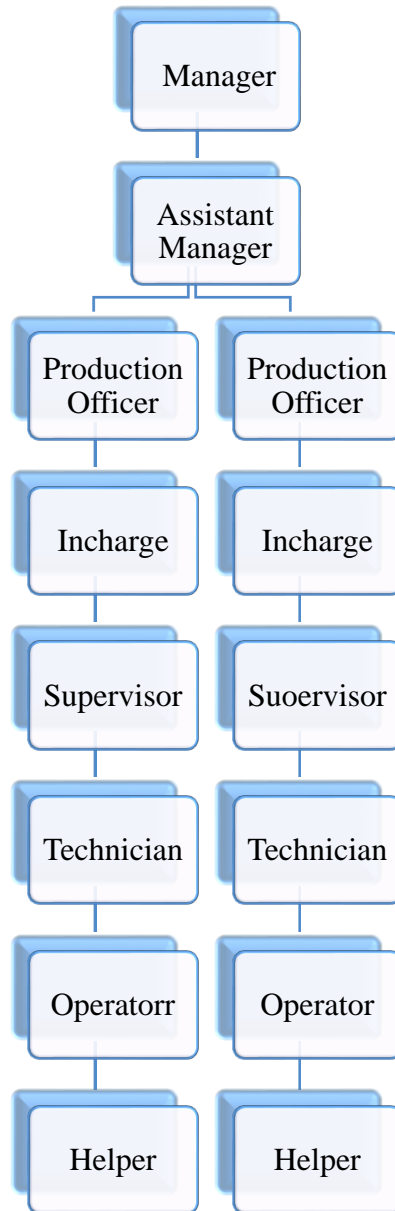


Fig: 3.3 Organogram of knitting

3.1.3 Machine List

Machine Name	No. of Machine	Capacity		Actual Production
Circular knitting machine	51	7000kg/12hour		7000kg/12hour
Flat knitting machine	6	Collar & Cuff	1200pcs/12hour.per m/c	1080pcs/12hour.per m/c
Fabric inspection machine	2			

Table: 3.1 Machine List

3.1.4 Machine Profile

Single & Double Jersey Circular Machine						
SL.NO	Dia	Gauge	Quantity	Brand	Origin	M/C Type
1	21"	24	1	JIUNNLONG	Taiwan	Single Jersey
2	22"	24	2	JIUNNLONG	Taiwan	Single Jersey
3	23"	24	3	JIUNNLONG	Taiwan	Single Jersey
4	24"	24	1	JIUNNLONG	Taiwan	Single Jersey
5	25"	24	2	JIUNNLONG	Taiwan	Single Jersey
6	26"	24	1	WILD HORSE	China	Single Jersey
7	28"	24	3	RONGXING	China	Single Jersey with Lycra Attachment

8	30"	24	6	RONGXING	China	Single Jersey with Lycra Attachment
9	32"	24	4	RONGXING	China	Single Jersey with Lycra Attachment
10	34"	24	6	RONGXING	China	Single Jersey with Lycra Attachment
11	36"	24	3	RONGXING	China	Single Jersey with Lycra Attachment
12	38"	24	4	RONGXING	China	Single Jersey with Lycra Attachment
13	30"	20	1	LYSKY	Taiwan	Fleece
14	34"	20	1	LYSKY	Taiwan	Fleece
15	30"	18	1	TARROT	Germany	Rib with Lycra Attachment
16	36"	16	1	TARROT	Germany	Rib with Lycra Attachment
17	36"	18	3	PILLOTEILL	Italy	Rib with Lycra Attachment
18	38"	18	1	FUKUHARA	China	Rib with Lycra Attachment
19	40"	18	1	FUKUHARA	China	Rib with Lycra Attachment
20	34"	18	1	FUKUHARA	China	Rib with Lycra Attachment
Total			46	Pcs		
Engineering Stripe Machine						
SL NO	Dia	Gauge	Quantity	Brand	Origin	M/C Type
1	30"	24	1	JUMBARCA	Spain	Single Jersey
2	34"	24	1	JUMBARCA	Spain	Single Jersey
3	34"	18	3	JUMBARCA	Spain	Rib/Interlock
Total			5	Pcs		

Table: 3.2 Descriptions of Circular Knitting Machine

Fabric Inspection Machine

Manufacturer	AATPR Industry Company Ltd.
Origin	Thailand

Table: 3.3 Description of fabric inspection Machine

3.1.5 Working Process in Knitting Section

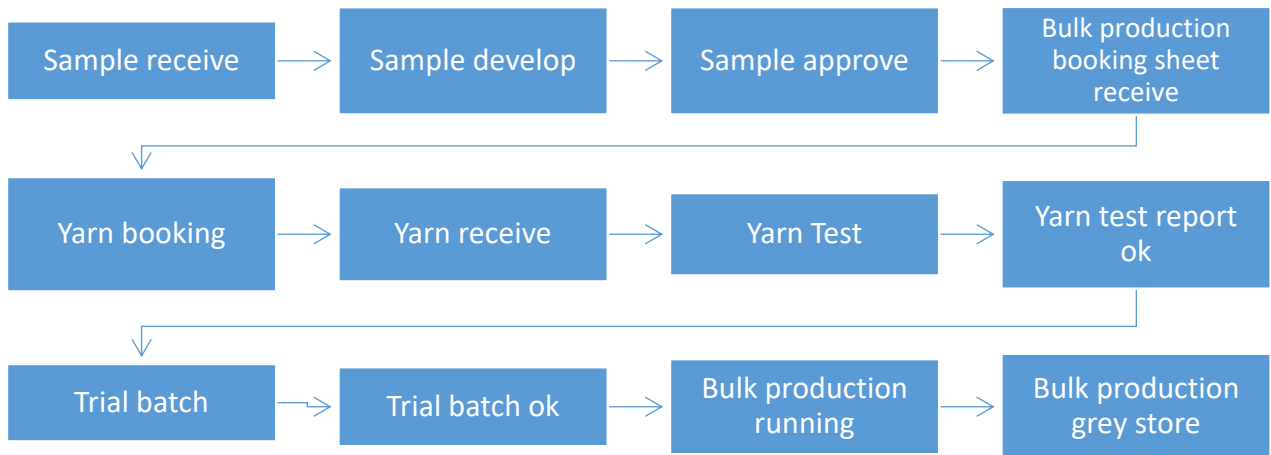


Fig: 3.4 Working Process in Knitting Section

3.1.6 Basic Knitting Element

➤ Needle.

It is a principal element of the knitting machine. It helps the yarn to create a loop. And by this way fabric are produce.

➤ Sinker.

It helps to loop forming, knocking over and holding down the loop.

➤ Cam.

Cam is a device which converts the rotary machine drive into a suitable reciprocating action for the needles

3.1.7 Yarn Passage Diagram

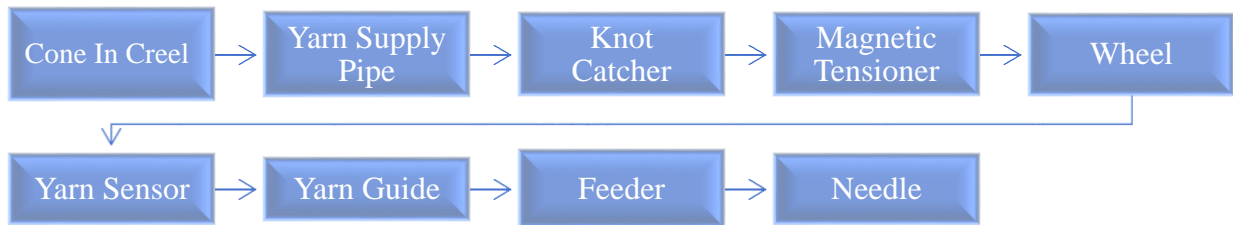


Fig: 3.5 Yarn Passage Diagram

3.1.8 Fabric Inspection Process

Four point system

Defect size	Points
3 inch or less	1
3 to 6 inch	2
6 to 9 inch	3
Over 9 inch	4
All hole	4

Table: 3.4 four point system

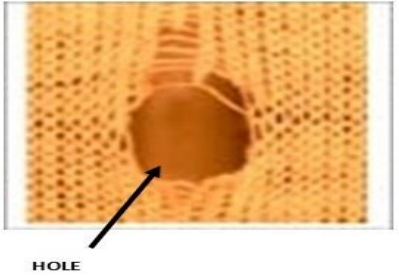
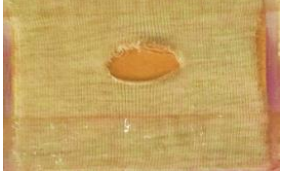



28 points per 100 square yards is acceptable

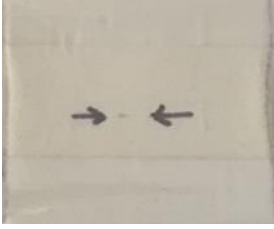
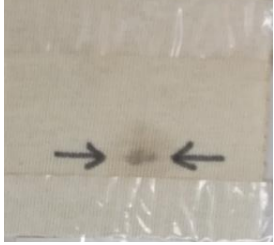



Points count x 36 x 100

Formula=

Roll length 9 (yds.) x Fabric dia (inch)

3.1.9 Different Defect in Fabric

Fault Name	Picture	Causes
Hole		<ul style="list-style-type: none"> ➤ Yarn feeder badly set ➤ Yarn breakage ➤ Yarn running tension is too high
Set-off		<ul style="list-style-type: none"> ➤ Yarn breaks before the yarn feeder ➤ Yarn package winding faults,
Oil spot		When oil licks through the needle to the fabrics
Sinker mark		Sinker head bend
Needle line		Caused by bend needle

Yarn contamination		Count mixing occurs
Dust knit		Dust on the machine part
Star mark		<ul style="list-style-type: none"> ➤ Yarn tension variation during production ➤ Due to damage of needle latch
Fly		When lint is too much flying during fabric production
Needle mark		<ul style="list-style-type: none"> ➤ Needles are not cleans. ➤ Use of defected bent needle.

Thick & Thin Places		<ul style="list-style-type: none"> ➤ It causes due to yarn problem. If thick & thin places remain in yarn. ➤ Tension variation
--------------------------------	---	--

Table: 3.5 Different Defect in Fabric

3.1.10 Knit Card

In Knitting section knit card is used to indicate some information . Such as-

- Order number
- Yarn type
- Buyer name
- Fabric type
- Colour
- GSM etc.

**(KNITTING SECTION)
PROGRAM SHEET**

M/c No. ৪ Date: 3/3/18

1. Buyer Name: Emben - 126

2. Order No: 969

3. Fabric Type: ১/১

4. M/c. Dia & Gauge: 32x24

5. Finish Dia: 34"

6. Yarn Count: 26 S/1 RK

7. Yarn Lot: 188

8. S/L: 2.80

9. Finish GSM: 160

10. Colour: white

11. Order Qty: 2,833.0 kg

বিঃ দ্রঃ ১। রিং দিতে হবে

২। ড্রেনে রাখতে হবে

৩। রোল খুলে রাখতে হবে

Fig: 3.6 Knitting program sheet

3.1.11 Types of Yarn Used

- 100% cotton
- Mélange
- PC
- CVC
- Polyester
- Spandex
- Organic
- Modal

3.1.12 Precaution

Mask and air plug should be used during production running.

3.2 DYEING SECTION

3.2.1 Layout

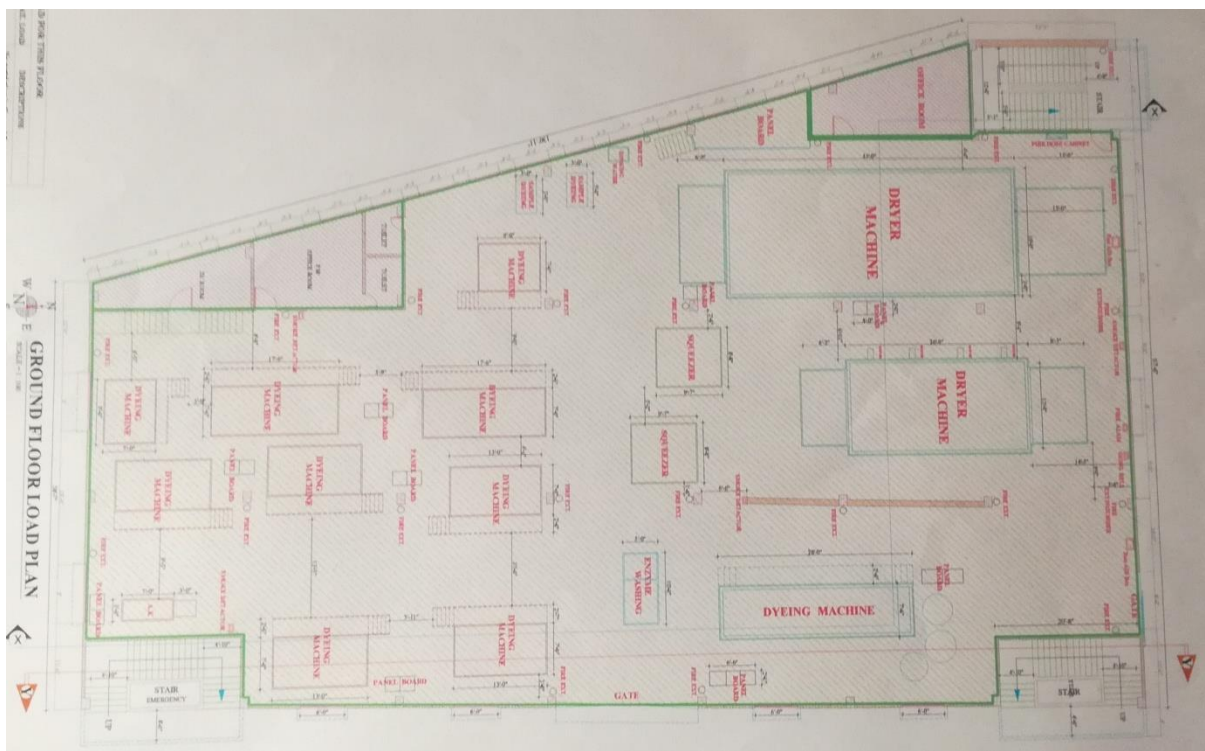
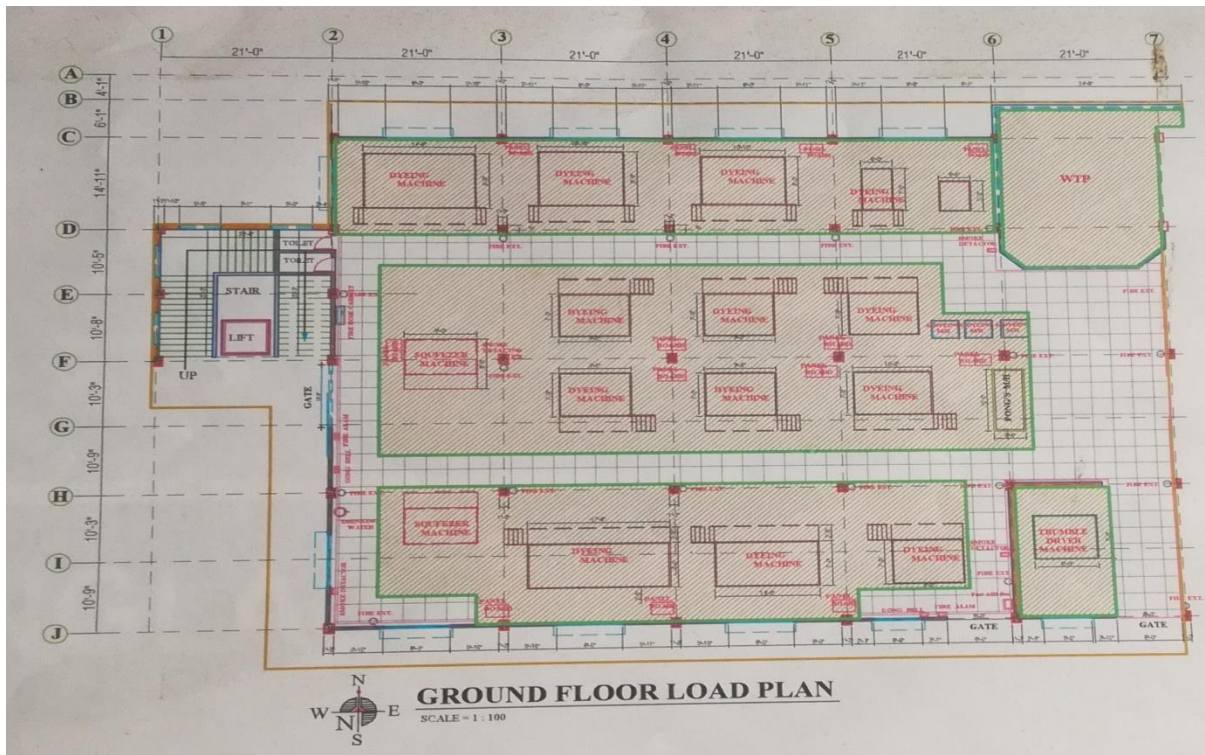


Fig: 3.7 Layout of dyeing section

3.2.2 Organogram

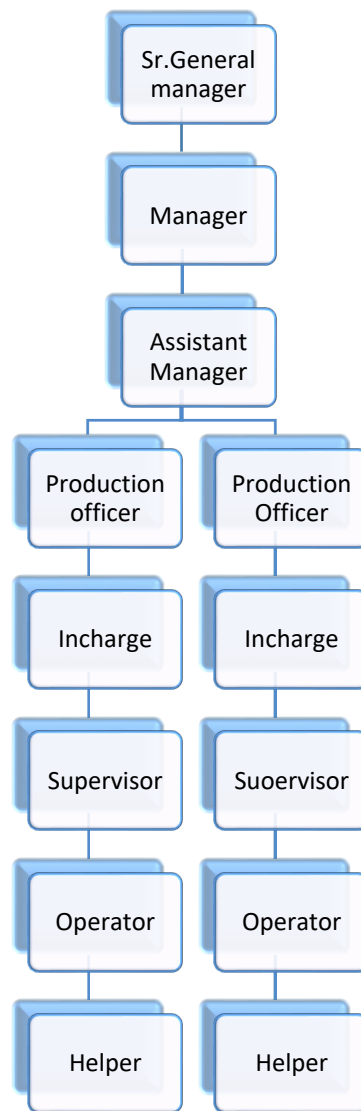


Fig: 3.8 Organogram of dyeing section

3.2.3 Lab

There are two type of testing

- i. Physical Test
- ii. Color Test

3.2.4 Physical Test

- Used for Perspiration, Saliva, Rubbing. Shrinkage, spiralling etc test

Washing machine

Function

- Used to wash the sample with standard washing chemical in order to assess the dimensional stability of sample.

Crock meter

Function

- Used to test the color fastness of fabric against rubbing

GSM cutter

Function

- Used to cut sample for GSM check.

Tumble dryer

Function

- Used to dry the sample.

Digital Balance

Function:

- Weight the sample fabric.

Shrinkage test

- Sample whose shrinkage test is to be done is placed on the table.
- Putting the glass template on sample and marking with unchangeable marker is done.
- Then the sample is washed at 60°C temperature for 60 minutes & Sample is dried out
- Three points on length side and three points on width side are checked to find out the dimensional change and mean value is taken for accurate result

Burn test

Function

- PC & CVC test

$\% \text{cotton} = \frac{\text{Original weight} - \text{Balance weight}}{\text{Original weight}}$

$\% \text{polyester} = (\text{Balance weight} / \text{Original weight}) * \%$

3.2.5 Color test Equipment

Auto disperse machine

Function:

Used for making a solution of dyes and chemical in accurate amount.

Solution Maker

Function: Mixing the different dye solution.

Data color Spectrophotometer

Function:

- Color matching
- Measuring color difference

Sample dyeing machine

Function:

- Used for dyeing the lab samples.

Water Hardness Tester

Function:

- Used to test the hardness of water.

Light box

Function:

- Checking color difference under different light source like D65, TL84, UV etc.

3.2.6 Process Dyeing and Finishing

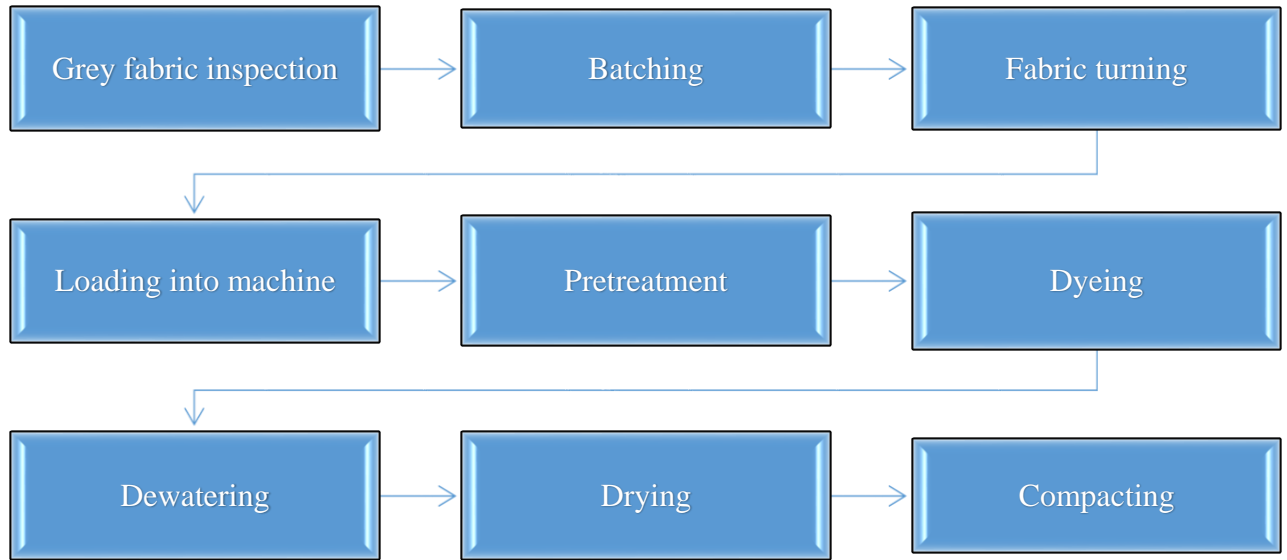


Fig: 3.9 Process of dyeing and finishing

3.2.7 Batch section

Batching is the process to get ready the fabrics which should be dyed and processed for a particular lot of a particular order. In batch section, quantity of fabric according to ratio of rib and body fabric is calculated.

3.2.8 Work done in Batch Section

- Receive the grey fabrics roll from knitting section or other source.
- Turn out the tubular fabric to safe the face side of the fabric from any type of friction during dyeing.
- Prepare the batch card of fabric for dyeing according to the following criteria-
 - Order sheet (Receive from buyer)
 - Dyeing shade
 - Machine available
 - Type of fabrics (100% cotton, PC, CVC etc.)
- Send the grey fabric to the dyeing floor with batch card.
- Keep records for every previous dyeing.

Batch Card:

R.K / PARITY FASHION LTD.
 (Knit Dyeing & Finishing Unit)
The House of Quality

Date :

Water Ltr

BUYER : *Sampsons Ltd.* OR/NO : *81/18*

COLOR : *white* LAB NO. : *(As Bsn)*

FAB. TYPE : *1x1 Rib* GSM : *160*

P. CHALLAN NO. : *467/458* BATCH NO. : *2427* Y.Count : *40*

UNIT : *3* M/C NO. : *3* Y. Lot :

HOLE	DIA	F/DIA	ROLL	WT (KGS)	REMARKS
1	364	96 cm	2	37.0	
2	40"	105 cm	6	148.0	
3	18"	50 cm	1	10.0	
4	32"	82 cm	1	18.0	
5			/	/	
			/	/	
			/	/	
			/	/	
			/	/	
			/	/	
TOTAL			10	213.0 kg	

BATCH PREPARED BY _____ CHECKED BY _____

COMMENTS	SIGN M/C OP	
	SIGN SNR OP	

Fig: 3.10 Batch Card

Formula for Batching

Ratio Wise batch (kg) = (Batch quantity * Dia. Quantity) / Total quantity

3.2.9 Fabric Turning Machine

If fabric produced in tube form, fabric turning machine is used. It is used for turning into back side to face side of fabric before dyeing. It is done mainly using high air speed.

Function

- To make the back face side
- To remove some dirt from the fabric



Fig: 3.11 Fabric turning Machine

3.2.10 Dyeing machine Specification

Serial Number	Unit	Machine Number	Machine Name	Origin	Type	Capacity (Kg)	Max Temp.
01	03	01, 02,	AK sample dyeing m/c	China	Sample dyeing	200	100 ⁰ C
02	03	03, 07	AK dyeing machine	China	Bulk Production dyeing	400	100 ⁰ C
03	03	04, 06	AK dyeing machine	China	Bulk Production dyeing	600	100 ⁰ C
04	03	05	AK dyeing machine	China	Bulk Production dyeing	800	100 ⁰ C
05	03	08	Fong's	India	Sample dyeing	50	100 ⁰ C
06	03	09, 10, 11	Fong's	India	Bulk Production dyeing	500	100 ⁰ C
07	03	12	Fong's	India	Bulk Production dyeing	600	100 ⁰ C
08	03	13	Fong's	India	Bulk Production dyeing	400	100 ⁰ C
09	03	14	Fong's	India	Sample dyeing	300	100 ⁰ C
10	03	15	Fong's	India	Sample dyeing	200	100 ⁰ C
11	03	16	Dong	South Korea	Sample Dyeing	50	140 ⁰ C

12	03	17, 18, 19	Dong	South Korea	Sample Dyeing	25	140 ⁰ C
13	02	01	AK dyeing machine	China	Bulk Production dyeing	400	100 ⁰ C
14	02	02	AK dyeing machine	China	Bulk Production dyeing	200	100 ⁰ C
15	02	03, 04	AK dyeing machine	China	Bulk Production dyeing	800	100 ⁰ C
16	02	05, 06, 07, 09, 10	AK dyeing machine	China	Bulk Production dyeing	600	100 ⁰ C
17	02	08	AK dyeing machine	China	Sample Dyeing	50	100 ⁰ C
18	02	11	Theis	Germany	HHP Dyeing Machine	1500	135 ⁰ C
19	03		Corino Squeezing m/c		Squeezing m/c		
20	03		Caloter Squeezing m/c	Sweden	Squeezing m/c		
21	02		SUN dryer machine	South Korea	Dryer machine		200 ⁰ C

Table: 3.6 Dyeing machine Specification

3.2.11 Dyeing Machine



Fig: 3.12 Dyeing machine

3.2.12 Dyeing Process

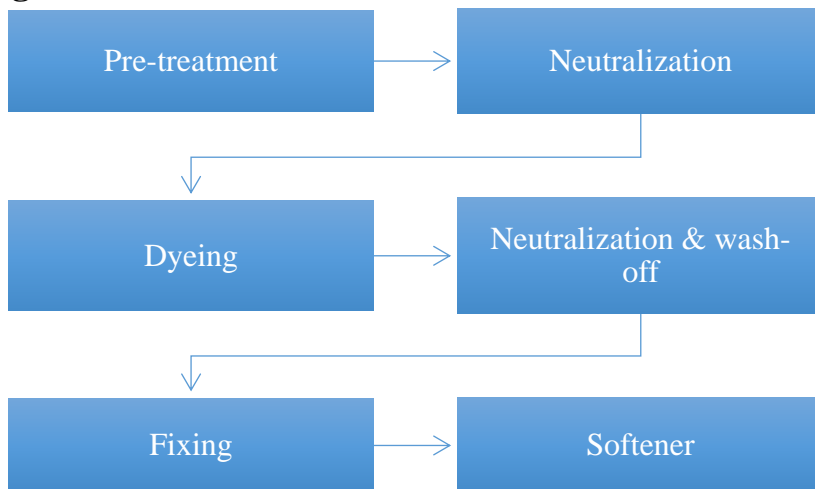


Fig: 3.13 Dyeing process

3.2.13 Chemical used in different process and their function

Process	Chemical	Function
Pre-treatment	Detergent	Used as wetting agent and also remove impurities.
	Sequestering agent	Used for remove water hardness.
	Ant creasing agent	Used for reducing crease effect of fabric during processing.
	Antifoaming agent	Antifoaming agent is used to resist foam formation during pretreatment and dyeing.
	Stabilizer	Increase rate of hydrogen peroxide
	Alkali	Dead fiber and dust remove.
	Bleaching agent	Increase the fabric whiteness.
Neutralization	Peroxide killer	Killed peroxide which is remaining in the material.
	Acid	P ^H control
	Enzyme	Remove Hairiness
Dyes & chemical	Leveling agent	Used for uniform dyeing.
	Dye	For fabric coloration.
	Salt	Increase the exhaustion rate of the dyeing process
	Soda	Control of the rate of reaction between reactive dye and cellulosic material.
Neutralization & Wash off	Acid	P ^H control
	Wash off	For removing unfixed dyes.

Fixing	Fixing agent	Fix the dyestuff and also remove unfixed dyes.
Softener	Softener	Soft the fabric.
	Acid	P ^H control

Table: 3.7 Chemical used in different process and their function

3.2.14 Recipe of bright white shade fabric

In here;

Lot weight: 405kg

M: L=1:6

Water= 2500L

Process	Chemical & amount	Run time & Temperature
Pre- treatment	PCL5- .8 gm. / l =2kg	40min
	2UD- .5 gm. / l =1.25kg	98 ⁰ C
	Soft- 1.5 gm. / l =3.75kg	
	C ₂ G- 1.0 gm. / l =2.5kg	
	Caustic- 3.0 gm. / l =7.5kg	
	H ₂ O ₂ - 9.0 gm. / l =22.5kg	
Neutralization	4BK- 2 % = 810gm	20min , 80 ⁰ C
	Acid- 1 gm. / l = 2.5kg	60min, 55 ⁰ C
	Enzyme- .15 % = 607gm	
	PH= 4.5-5.5	

Table: 3.8 Recipe of bright white shade fabric

3.2.15 Finishing

3.2.16 Slitting Machine

Manufacturer name: Bianco S.P.A

MAX: Speed:90(M/min)

Type: Super slit

Origin: Italy



Fig: 3.14 Slitting Machine

Object of slitting machine

- To open tube fabric according to specific needle mark.

Function

- Remove excess water.
- Slit the tube fabric by the knife for opening of the fabric.
- Remove dust by spraying water on fabric.
- It can control the diameter of fabric and GSM and shrinkage.

3.2.17 Stenter Machine

Two m/c (10chamber & 8 chamber)

Brand: Platinam

Manufacturer: EHWHA

Origin: South Korea

Temperature range: 50-250° c

Pressure: 1.5-4.0 kg, normally 3 kg

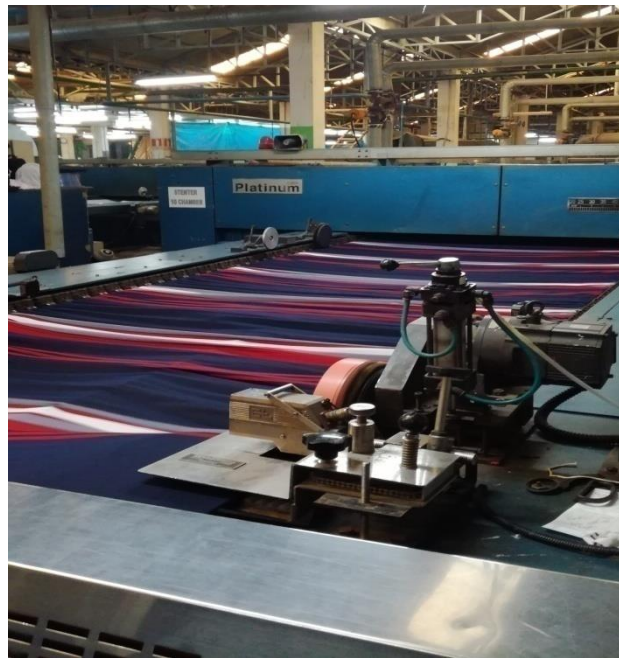


Fig: 3.15 Stenter Machine

Function

- ❖ Width of the fabric is controlled by the stenter.
- ❖ Spirality controlled by the stenter.
- ❖ GSM of the fabric is controlled by stenter.
- ❖ Shrinkage property of the fabric is controlled.
- ❖ Finishing chemical apply on fabric by the stenter.

Chemical used in Stenter machine

- i. Anti-crease + Detergent for heat seat
- ii. Softener / fixing agent for color fabric

Temperature needed:

White: 110⁰c - 140⁰c

Black: 120⁰c - 160⁰c

Dark: 120⁰c - 120⁰c

Light: 130⁰c - 140⁰c

3.2.18 Compactor Machine

Brand Name: FERRARO

Origin: Italy



Fig: 3.16 Compactor machine

Function of Compactor machine

- i. Control GSM
 - If over feed is more then GSM is also more.
 - If over feed speed is less then GSM is also is less.
 - If dia is more then GSM of the fabric will less.
 - If dia is less then the GSM of the fabric will more.
- ii. Control shrinkage

Shrinkage is controlled by proper over feeding
- iii. Control fabric Dia.

Dia is controlled by dia controlling meter scale

 - If over feed speed is more then dia of the fabric will be more.
 - If Over feed speed is less then dia of the fabric will be less.
 - If length is more then width of the fabric is reduced.
 - If length is less then width of the fabric is more.
- iv. Increase smoothness of fabric

Temperature needed

White: 100⁰c

Off white: 110⁰c

Dark: 130⁰c - 140⁰c

Fleece: 140⁰c - 160⁰c

3.2.19 Quality Control

- i. GSM check
- ii. Fabric inspection

Fabric inspection is done by 4.0 systems

28 points is acceptable in 100 sq. yards

- Up to 18: Grade A
- 19 – 28: Grade B
- Over 28 is reject

Defects Name

- Uneven Dyeing
 - Crease mark
 - Dye spot
 - Softener Mark
 - Rib mark
 - Needle line
 - Hole
 - Lycra missing
 - Dirty spot
 - Iron spot
 - Patta
- iii. Shade check

3.3 GARMENTS SECTION

3.3.1 Organogram

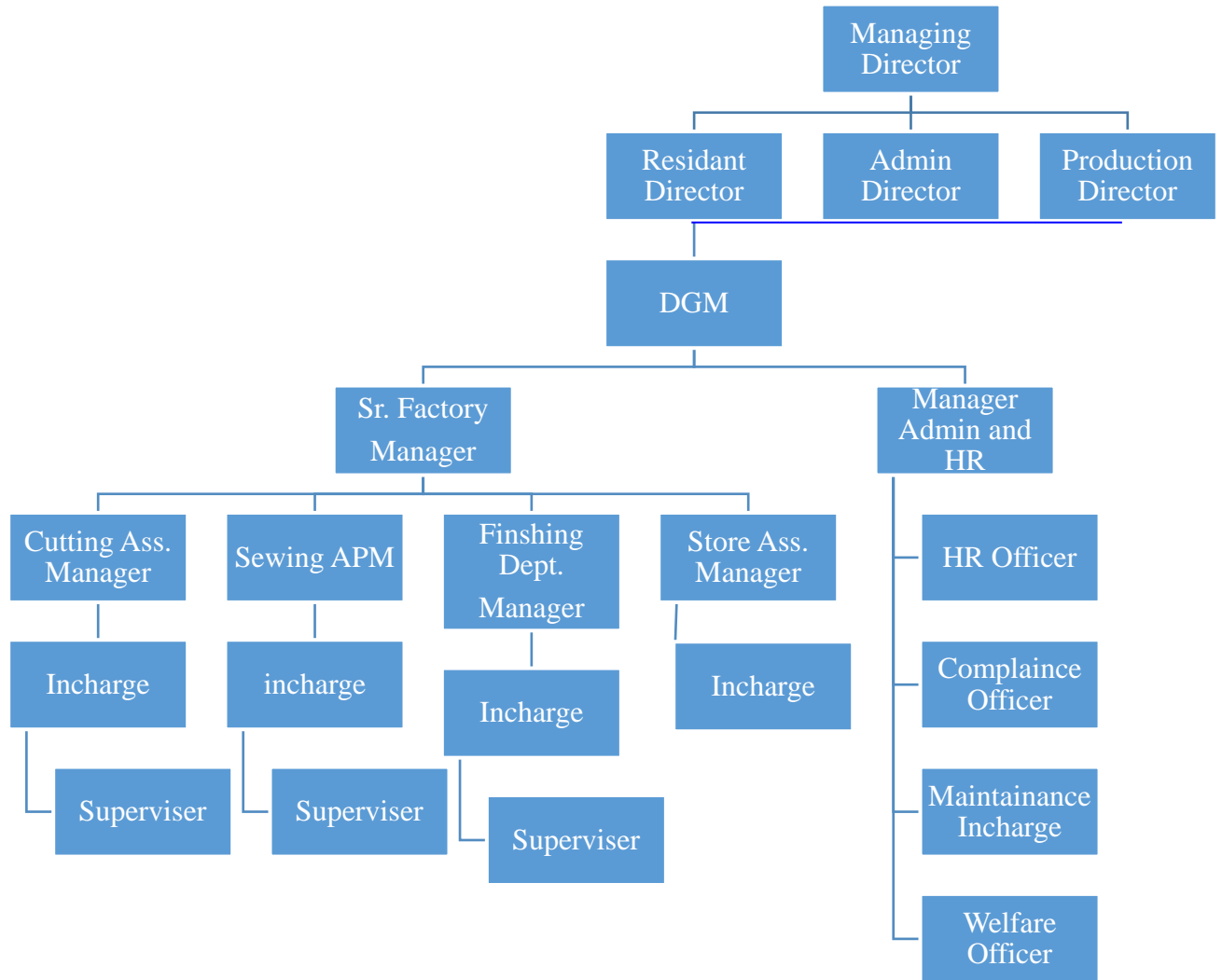


Fig: 3.17 Organogram of garments section

3.3.2 CAD and Sample Section

Functions of CAD room:

- Producing pattern
- Marker making
- Calculate marker consumption

Marker machine specification

Brand name: IOLINE

Manufacturer: Ioline Corporation

Origin: USA



Fig: 3.18 Marker machine

$$(\text{Marker length in inch} + \text{AL}) \times (\text{Marker width in inch} + \text{AL}) * \text{GSM}$$

Marker consumption= ----- * 12

1550 x 1000 x number of pattern pieces

- Maximum marker width 72”
- Marker efficiency should be minimum 85%.
- Marker efficiency depend on wastage during cutting

Software

For marker making TUKA CAD software is used

Key factors during marker making

- Fabric width must be higher than marker width
- Fabric length must be higher than marker length
- Allowance must give in end and selvedge minimum 1”
- Grain line must be parallel to the line Wales in knitted fabric.



Fig: 3.19 Sample section

Function of sample section

- Working pattern making

Pattern which is used to make sample garment. Working pattern used as a base for manipulation when generating design pattern.

- Size set sample making

Machine in sample room

- Plain machine
- Overlock machine
- Flatlock machine
- Button hole machine

3.3.3 Store Section

Function

- Store the materials for order
- Issue and supply the materials to production unit
- Prepare Inventory report after receiving fabric for each order then numbering different shade of color of the fabric role.
- Locally and Imported fabric is stored.
- Mostly imported fabric comes from India.
- Different types of fabric like 100% cotton single jersey, Terry, Fleece & spandex etc.

Different Types of Accessories

<ul style="list-style-type: none">➤ Main label➤ Care label➤ Size label➤ Threads➤ Twill tape➤ Hanger sizer➤ Hanger loop➤ Price sticker➤ Tissue paper➤ Snap button➤ Hang tag➤ Hanger	<ul style="list-style-type: none">➤ Elastic➤ Zipper➤ Hit seal label➤ Carton➤ Poly➤ Rope➤ Button➤ Garment Marking Chalk➤ Lock pin➤ Poly sticker➤ Gum tape➤ Eyelet
---	---

Table: 3.9 Different Types of Accessories

3.3.4 Cutting Section

Spreading

Fabric spreading is the part of apparel manufacturing process. Fabric spreading is done after marker making. Spreading of fabric can be defined as the smooth laying out of the fabric of specific length and width. The marker is laid on the top most layer of the fabric. Cutting operation is done after completing fabric spreading. Cutting performance depends on fabric spreading. Spreading is done manually



Fig: 3.20 Fabric spreading

Requirements of Fabric Spreading

- Alignment of fabric ply,
- Correct ply tension,
- Fabric must be flat,
- Elimination of fabric defects,
- Correct ply direction and lay stability,
- Easy separation of the cut lay into bundles,
- Avoidance of distortion in spreading,
- Matching the shade of fabric



Fig: 3.21cutting Section

3.3.5Process of Cutting

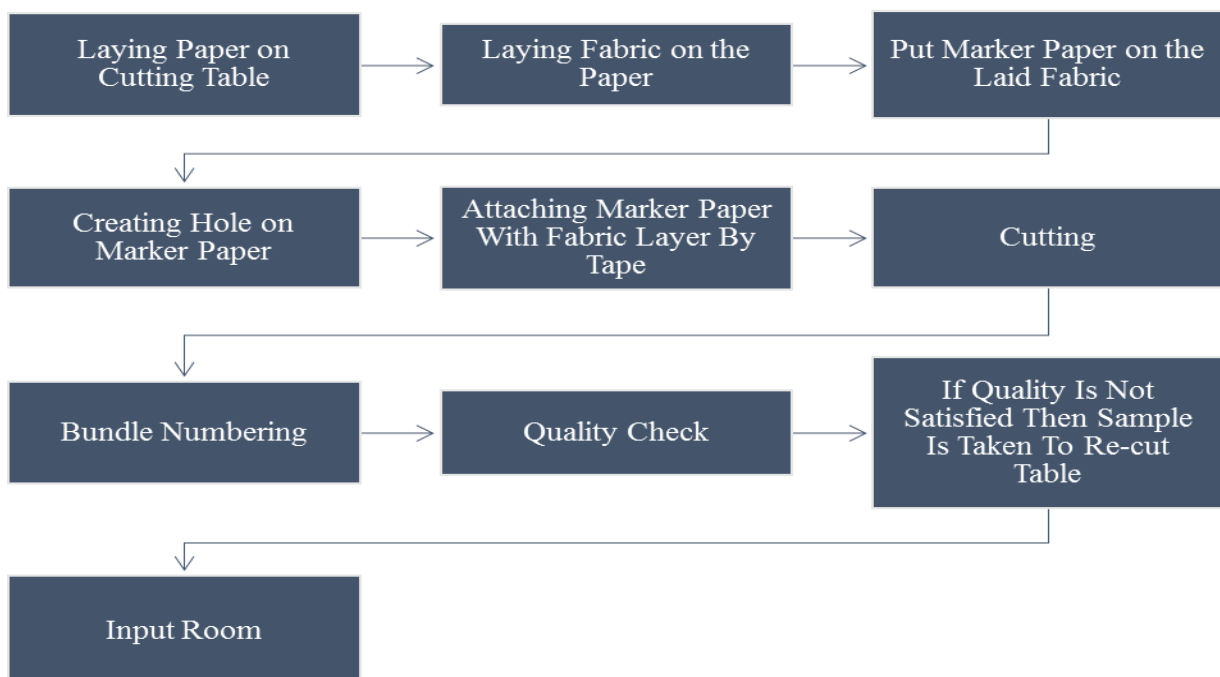


Fig: 3.22 Process of cutting

Machine name	Cutting machine
Specification	Straight knife cutting machine: Machine name : K.M company cloth cutting m/c Mode : K.M KS_AUV Producer : made by K.M cutting m/c co, JAPAN Type : Heavy duty industrial cloth cutting m/c self-Sharpener Dimension : 8 inch width * 11 inch length * 24 inch height Weight : 33.5 lb Speeds : 3000/3600
Function	Used for cutting fabric layer according to maker.

Table: 3.10 Fabric cutting machine description



Fig: 3.23 Fabric cutting machine

3.3.6 Parts of Cutting Machine with Their Functions

- Plate: To stand the machine and help to move the machine.
- Feed: To hold the layer of fabric by pressure.
- Knife: To cut the layer of fabric precisely.
- Handle: To help to move the whole cutting machine according to design.
- Power switch: It is used to run and stop the machine.
- Oil box: To supply oil or lubricant to the machine parts.
- Motor: To give reciprocating motion to the knife for cutting.
- Sharpening device: To make sharp the knife edge when required.

3.3.7 Points Should Concern Fabric Cutting

- During Cutting operator must be used metal gloves.
- Precision in cut i.e. the dimension of pattern and fabric parts is cut should be same.
- The cut edge must be cleaned.
- Infused edge.
- Consistency in fabric cutting.
- Support of lay.
- Drill hole and size should be appropriate and it will be placed in its right place. If it is too large it would be seen after sewing. But if it is too small then it can be blocked easily.
- Should position the pattern pieces on the fold or on the grain line as indicated.
- Without shoe operator should not use cutting machine.
- Mask must be used during cutting.

3.3.8 Lay Height

- Single jersey/ spandex/ interlock: Maximum 2-2.5"
- Single jersey/Cotton & Others: Maximum 3-4"
- Fleece Maximum 4-4.5"
- Mesh/Dazzle: 2"

3.3.9 Cutting Table Specification

- Total Cutting Table: 4 pcs
- Table Height: 33”
- Table Width: 97.5”
- Table Length: 840”

3.3.10 Wastage during Cutting

- Ends of ply losses.
- Selvage loss.
- Loss of fabric in roll.
- Loss for fabric defect.

3.3.11 Sewing Section

3.3.12 Process

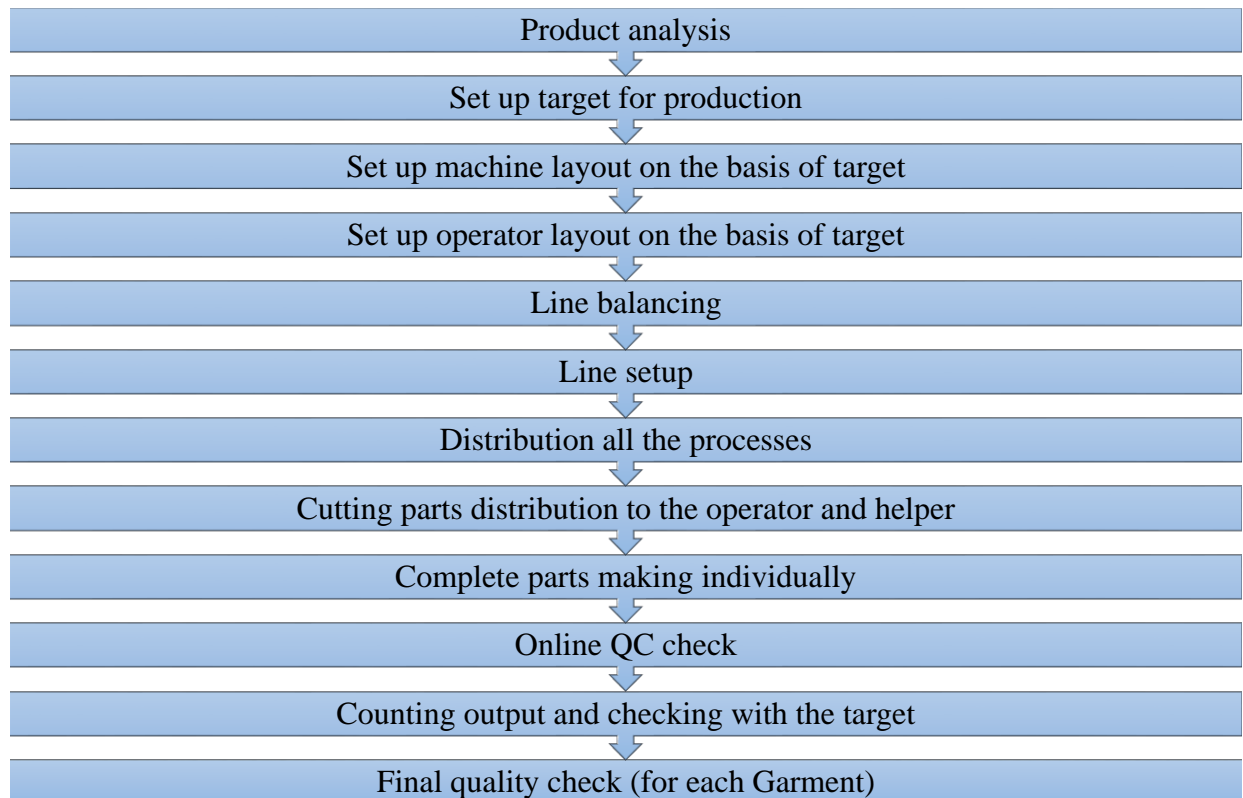


Fig: 3.24 sewing process

3.3.13 Different Type's Machineries with Functions in Sewing Section



Fig: 3.25 Plain machine

Application:

- Bottom hemming
- Belt making
- Loop tack stitch
- Pocket joint stitch
- Zipper joint
- Neck top stitch etc.



Fig: 3.26 Over lock machine

Application:

- Neck piping
- Sleeve piping
- Sleeve joint
- Side seam etc.



Fig: 3.27 Flat bed machine



Fig: 3.28 Flat lock cylinder bed machine

Application:

- Belt top seam
- Back tape joint



Fig: 3.29 Button Hole machine

Application:

To create a hole for button



Fig: 3.31 Bar tack machine

Application:

Bar tack stitch

Application:

- Sleeve hem
- Leg hem



Fig: 3.30 Button attaching machine

Application:

To attached button in garment



Fig: 3.32 Rib Cutter machine

Application:

Cutting rib and make roll



Fig: 3.33 Flat lock edge cutter machine

Application:

For body hem.

Table: 3.11 Sewing Machine

3.3.14 Sewing Machine needle information

Machine Name	Needle Name	Size
Plain	Db	7-12
Over Lock	Dc	7-12
Flat Lock/Feed of the Arm	Uy	7-12
Button Hole/ Bartech	dp-5	11-14
Button Attaching	Dp-17	11-14

Table: 3.13 Sewing Machine needle information

3.3.15 Machine layout (T-shirt)

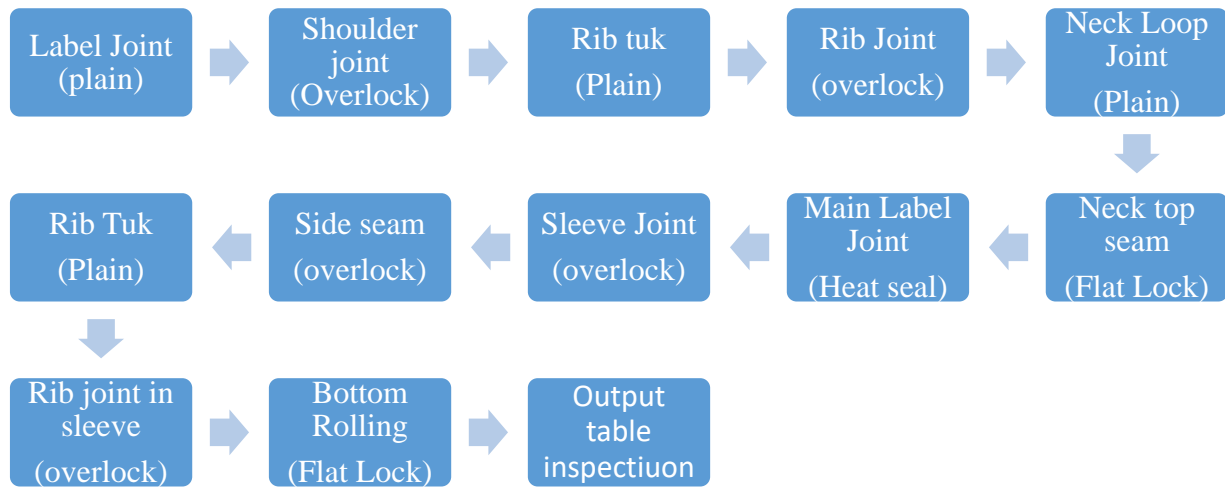


Fig: 3.34 Machine layout (T-shirt)

3.3.16 Line Target/Hour

In this garments machine cost per day \$40

Cost per machine * Number of machine per product in line = Total cost

CM cost / dz. Of garments

----- = CM cost/pcs

12

Total cost

----- = production/day

CM cost/pcs

In garments section daily 10 hours is available.

3.3.17 Quality control in sewing section

Sewing defects

- Needle damage
- Skipped stitch
- Seam pucker
- Wrong stitch density
- Uneven stitch
- Defected stitch
- Oil spot

Seaming defects

- Uneven width
- Uneven seam line
- Not secured by back stitch
- No matching of check or stripe
- No matching of seam
- 4 point check

3.3.18 Finishing Section



Fig: 3.35 Finishing section

3.3.19 Finishing Work in Process

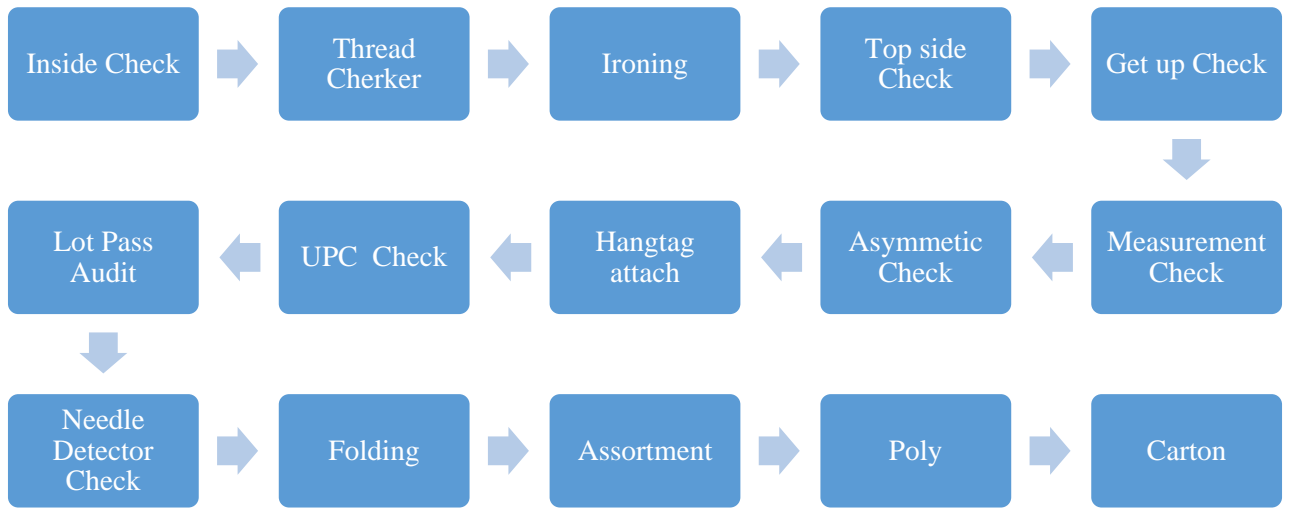












Fig: 3.36 Finishing Work in Process

3.3.20 Process and Their Function

Process	Function	View
Inside Check	Check defect in inner part of garments. Like missed stitch, uneven seam.	
Thread checker	Remove loose thread from garments part.	

<p>Ironing</p>	<p>Create a shape of garments.</p>	
<p>Top side Check</p>	<p>Check defect in top part of garments</p> <p>Like,</p> <p>Uncut thread, Skipped stitch,</p> <p>Open seam</p>	
<p>Get-up check</p>	<ul style="list-style-type: none"> ➤ Check Cutting small thread ➤ Check Whether color shade is right or not ➤ Check Spot in garments 	
<p>Measurement check</p>	<p>Check measurement according to buyer requirement</p>	

<p>Asymmetric check</p>	<p>Check uneven parts of garments.</p>	
<p>Hang tag attach</p>	<p>Hang tags are attached with a garment, such as,</p> <ul style="list-style-type: none"> a) Price tag b) Tag of garment type <p>These hang tags are attached with garment either by hand or by hang tag machine.</p>	
<p>UPC check</p>	<p>Checking barcode and style number of garments</p>	
<p>Lot pass audit</p>	<p>In here takes number sample from a lot then check all faults. If faults are found greater than the acceptable range then the lot is rework.</p>	

<p>Needle detector check</p>	<p>It identifies needles in garments if have.</p>	
<p>Folding</p>	<p>Pressed garments are folded in a specific dimension. This work is usually done by women labors.</p>	
<p>Assortment</p>	<p>In this section garments are assorted in different size and color in a ratio.</p>	
<p>Poly</p>	<p>In this section garments are packed in poly.</p>	


Carton	Poly is filled in carton.	
---------------	---------------------------	--

Table: 3.13 Finishing Process and Their Function

3.3.21 Final Inspection

Garments are inspected by AQL. In this system samples are collected inspected by statistically from the lot size and will decide the lot of garments to be granted or rejected. AQL is mainly used in final inspection after garment making.

3.3.22 Merchandising Department

Merchandising is the department which mediates marketing and production departments. Sometimes, merchandising department will also have to do costing and pricing.

Work Done by Merchandiser

- Buyer searching
- Costing and consumption
- Order receive
- Sample approval
- Prepare TNA
- Fabric and accessories booking
- Follow up lead time
- Production follow up
- Delivered good at right time and right quantity

3.3.23 Calculation of Knit Fabric Consumption (T-shirt)

Body fabric consumption per dozen, (all measurements in cm)

$$= \frac{(\text{Bodylength} + \text{Sleevelength} + \text{Allowance}) * \left(\frac{1}{2}\text{chest} + \text{allowance}\right) * 2 * \text{GSM} * 12}{10000 * 1000} + \text{Wastage}\%$$

Neck Rib Consumption:

Width = Neck width x 2 + 2 cm (Round)

Total Height = Rib Height X 2 + Allowance

3.3.24 Points for consumption

- Types of fabric and fabric GSM will be confirmed by the buyer.
- For body length and sleeve length, approximate sewing allowance should be needed at body hem, shoulder joint, sleeve hem and armhole joint.
- For chest width, approximate sewing allowance should be needed at both side.
- And approximate fabric wastage in various stages is 5 to 15%.

3.3.25 Costing of a Basic T-shirt

Total fabric consumption = 2 kg/dz.

Actual fabric consumption = 2 + (13% process loss + 5% cutting wastage)

$$= 2.38 \text{ kg/dz.}$$

Yarn cost ----- \$2.7/kg

Knitting cost-----\$.2/kg

Dyeing cost-----\$1.7/kg

Total-----\$4.6/kg

Others

CM (cost of making) -----\$ 6.00

Accessories cost ----- \$ 3.50

Chest print -----\$ 2.00

Lab test -----\$ 1.00

Others cost-----\$2.00

Total -----\$13.50

In total cost /dz. = (\$ 4.6×2.38) +\$ 13.50 = \$ 22.7/dz.

Buying house (%) + profit % = 5% + 10%

= 15%

Now cost of a t-shirt= (\$22.7+15%) / 12

Per pcs FOB = \$2.18

3.3.26 Maintenance Section



Fig: 3.37 Maintenance section

Maintenance is a process by which equipment is looked after in such a way that trouble free.

- All machines are checking in every month.
- Oil change depends on machine use.
- Mostly cutting machine oil change in every 7 days.
- If any problem occurs exchange machine or solve machine problem as early as possible.

Chapter 4

Impact of Internship

4.1 Knitting Section

In knitting section we have learned about the following topics:

- Introducing with different types of knitting machine.
- Know about knitting faults.
- Knowing different types of fabric.
- Four point system.
- Knitting fabric inspection system.
- Knowing about fabric inspection machine etc.

4.2 Dyeing Section

In dyeing section we have learned about the following topics:

- Introducing different type of dyeing and finishing machine.
- Different types of dyeing and finishing machine functions.
- Inspection system.
- How to GSM control in stenter and compacting machine.
- Batch section work.
- Different types of test in lab.

4.3 Garments Section

In garments section we have learned about the following topics:

- Know about different types of sample.
- Introducing with TUKA CAD.
- Know about marker.
- How to make marker for production.
- How to improve marker efficiency.
- Know about thread consumption
- Fabric consumption.
- Know about fabric spreading procedure.
- Introduced to different cutting machine.
- Introducing different types of sewing machine.

- Know about different types of sewing machine function.
- Know about different type of stich.
- Know about different types of stitches.
- Inline inspection & Table inspection
- Final inspection.
- Daily production target calculation
- Inspection procedure of buyer.
- Maintenance section working process.etc.

Chapter-5

Conclusion

5.1 Conclusion

Industrial attachment is a most important and essential part for completing B.Sc. program in textile engineering. Actually there is large difference between theoretical knowledge and practical knowledge. Industrial training is an essential part for textile education because it minimizes the gap between theoretical and practical knowledge. This industrial training increases our knowledge though a lot about textile technology. It also helps us to know a lot about industrial production process, machineries, industrial management etc. It made us suitable for industrial life. It is also gives some experience to prepare us for the expected or destiny in future.

Overall we can say industrial training would be helpful in future progress.

5.2 Limitations

- Two months is not enough time to complete industrial attachment. If we get more time we will know lot and complete it more effectively.
- In here garments section is so small.
- Some operation is controlled of garments section by head office. Like CAD, Merchandising.
- All operators cannot provide full or right information.
- It is not possible to reporting full information for some limitation. So, we try our best to summarize all the information.