



Daffodil
International
University

Faculty of Engineering
Department of Textile Engineering

Course Code: TE 431
Course Title: Industrial Attachment

A Report on
Hypoid Composite Knit Limited

Submitted by:

Name	ID
Md. Shajal Shekh	152-23-195
Md. Salahuddin	152-23-4327

Academic Supervisor:

Sumon Mozumder
Assistant Professor
Department of Textile Engineering
Faculty of Engineering
Daffodil International University

Factory Supervisor:

S.M Sayeedur Rahman (Raju)
General Manager (Knit & Dyeing)
Hypoid Composite Knit Ltd.

This report submitted in partial fulfillment of the requirements for the degree of Bachelor of Science in Textile Engineering

FALL 2018

DECLARATION

We hereby say publicly that; this internship has been done by us under the supervision of **Sumon Mozumder, Assistant Professor, Department of Textile Engineering, Faculty of Engineering, Daffodil International University**. We also declare that, neither this report nor any part of this has been submitted away for award of any degree or diploma.

Md. Shajal Shekh

ID: 152-23-195

Department of Textile Engineering

Faculty of Engineering

Daffodil International University

Md. Salahuddin

ID: 152-23-4327

Department of Textile Engineering

Faculty of Engineering

Daffodil International University

LETTER OF APPROVAL

The internship report on **Hypoid Composite Knit Ltd.** is ready by **Md. Shajal Shekh (ID: 152-23-195)** and **Md. Salahuddin (ID: 152-23-4327)**. This report is submitted in partial contentment of the requirements for the degree of BACHELOR OF SCIENCE IN TEXTILE ENGINEERING. The whole report is prepared under my supervision and guidelines. During the internship the students were found sincere, punctual and hard working. I wish them every success in life.

Sumon Mozumder

Assistant Professor,
Department of Textile Engineering
Faculty of Engineering
Daffodil International University

ACKNOWLEDGEMENT

All pleasure goes to the Great Allah to give us strength and ability to complete our two months long industrial attachment at **Hypoid Composite Knit Limited**. It was a good opportunity for us to complete the industrial attachment with the support of persons employed in Industry name.

We feel grateful to our academic supervisor **Sumon Mazumder**, Assistant Professor, Department of Textile Engineering, Faculty of Engineering, Daffodil International University as well as to, **S.M Sayeedur Rahman (Raju)**, General Manager (Knit & Dyeing), Hypoid Composite Knit Ltd. our factory supervisor for their continuously guiding us about the development and preparation of this training report. They have enriched us with sharing necessary theoretical and practical ideas and supervised us to complete this report on time.

We would like to express our thanks to **Prof. Dr. Md. Mahbubul Haque**, Head, Department of Textile Engineering, Faculty of Engineering, Daffodil International University for his kind help to finish our training report.

We are also grateful to the supervisors, technicians, operators and all other staffs of **Hypoid Composite Knit Limited**, who were most cordial and helpful to us during the tenure of internship.

Finally, we would like to express a sense of gratitude to our beloved parents and friends for their mental support, strength and assistance throughout writing the training report.

***THIS REPORT IS DEDICATED TO MY
BELOVED & RESPECTED PARENTS AND
TEACHER***

TABLE OF CONTENTS

Contents	Page No.
DECLARATION.....	i
LETTER OF APPROVAL.....	ii
ACKNOWLEDGEMENT.....	iii
DEDICATED.....	iv
CHAPTER-1: EXECUTIVE SUMMARY	2
CHAPTER-2: INFORMATION ABOUT FACTORY.....	4
2.1.1 Factory Profile:	4
2.1.2 Aim and Objective of the factory:	5
2.1.3 Certification:	5
2.1.4 Location Layout:	6
2.1.5 View from Google Map:	7
2.1.6 Management Process of H C K Ltd:	7
2.1.7 Achievement	8
2.1.8 Extra facilities providing by the factory:	8
2.1.9 Main Buyer:	8
2.2 Producing Garments Product by HCKL:	9
2.2.1 Producing Fabric by HCKL:	9
2.2.2 Source of Raw Material:	10
CHAPTER-3 DETAILS OF ATTACHMENT	
3.1 KNITTING SECTION	12
3.1.1 Introduction.....	13
3.1.2 Warp knitting:	13
3.1.3 Weft knitting:	13
3.1.4 Management Organogram of Knitting Section:.....	14
3.1.5 Layout of knitting section:	15
3.1.6 Process Flow Chart of Knitting:	16
3.1.7 Specification of Machines in knitting section:.....	16
3.1.8 End Products of circular Knitting m/c:	18
3.1.8.1 Single Jersey M/C:	18
3.1.8.2 Double Jersey M/C:	19
3.1.9 Factors concerned with Knitting:.....	19

3.2 Points Should Be Considered for GSM Changing:.....	19
3.2.1 Factors That Should Be Considered for Changing of Fabric Design:	20
3.2.2 Different parts of knitting Machine:	20
3.2.3 Yarn used for knitting process:	21
3.2.4 Production calculation of Knitting:.....	21
A. Production/ Shift in kg at 100% efficiency:.....	21
B. Production/ Shift in meter Course/ min:	21
C. Fabric width in meter:	21
3.2.5 Fabric Inspection (4-Point system):	22
3.2.6 Knitting Check list:	22
3.2.7 Faults, Causes & Their Remedies in Knitting:	23
3.2.8 Shift Change:	26
3.2.9 Photo of Knitting Machine:	26
3.3 Fabric Type:	28
3.4 DYEING LABORATORY SECTION.....	33
3.4.1 Objectives of lab dip development:	34
3.4.2 Organogram of Laboratory:	34
3.4.3 Developing sequence of Lab dip in H C K L:	35
3.4.4 Color measurement of standard sample:	36
3.4.5 Preparation of stock dyes solution:	36
3.4.6 Stock solution preparation:	37
3.4.7 Machine used in Lab dip:.....	38
3.5 BATCHING SECTION.....	39
3.5.1 Grey Store	40
3.6 Batching Section	41
3.6.1 Organogram of Batch Section:.....	41
3.6.2 During batching following factors are considered:.....	42
3.6.3 Function or purpose of the batch:	42
3.6.4 Process Sequence of Batch Preparation:	43
3.6.5 Machine use in Batching:.....	44
3.7 DYEING SECTION.....	45
3.7.1 Management personal of dyeing section:	46
3.7.2 Sample Machine:	47

3.7.3 Production Machine:	48
3.7.4 Raw Material for Dyeing:	51
3.7.5 Grey Fabric:	51
3.7.6 Chemical Used in H C K Ltd.:	52
3.7.7 Dyes Used in H C K Ltd.:	55
3.7.8 Some dyeing Parameters used in dyeing:	59
3.7.9 Dyeing Sequence with Recipes:	60
3.8 Common Faults and Remedies:	64
3.8.1 Same Picture of dyeing section:	67
3.8.2 FINISHING SECTION	70
3.8.3 Machine description of finishing section:	70
3.8.4 Objectives of different finishing Machine:	70
3.8.5 Picture of Finishing Machine:	71
3.8.6 Quality Control	74
3.8.7 Introduction:	74
3.8.8 Objective of quality control:	74
3.8.9 Quality control System in H C K Ltd.:	75
3.9 List of Equipment:	76
3.9.1 MAINTENANCE & UTILITY SECTION.....	77
3.9.2 Objective of maintenance:	78
3.9.3 Types of maintenance in H C K Ltd.:	78
3.9.4 Utility:	78
3.9.5 Effluent Treatment Plant (ETP):	81
3.9.6 Process Sequence of ETP:	82
3.9.7 Photo Gallery of E T P:	83
CHAPTER-4 IMPACT OF INTERNSHIP	85
CHAPTER-5 CONCLUSION.....	87

CHAPTER-01

EXECUTIVE SUMMARY

CHAPTER-1

EXECUTIVE SUMMARY

Textile and garments sector is the biggest and fastest growing sector of Bangladesh. It is also the highest foreign currency earning sector of Bangladesh. Bangladesh earns nearly \$27 billion a year by exporting textile and garments products to all over the world.

From the start of this project, we have to work a lot harder. We did our internship program group wise comprising 2 (two) members. Here, we have to approach each and every department. Every people help us of the industry to make our internship program easy. Actually limitation was that time was very much shorter. We tried to conduct our work successively. So we began my journey from yarn storage section and ended it at Industrial Engineering department. We have worked in Knitting, Dyeing, Finishing, also for the ETP Also.

Our internship period was between 20th September 2018 to 24th November 2018 for two months in Hypoid Composite Knit Ltd.

CHAPTER-02

INFORMATION ABOUT FACTORY

CHAPTER-2

INFORMATION ABOUT FACTORY

2.1 About Factory:

Hypoid Composite Knit Ltd. Is composite mill. So, the factory has a ability to offer a complete product to the market from fiber to fabric and finish garments. The factory with address of 176, South Krishnapur, Rajashan, Savar, Dhaka, Bangladesh has incorporated as a private limited company in June 2006.

The factory 100% export oriented Garments Manufacturing industry. They manufacture and exports knitwear garments only. The factory started exporting knit wear garments since 2007 and increase their exporting business to various region EU countries Germany, UK, Norway Etc.

The factory has 4 High temperature & 3 Normal high temperature dyeing machines. The factory used eco-friendly dye stuff which is not hazardous for kind & environment. The factory also has a facility of Cutting, Sewing, Finishing, Ware housing and Eastern Treatment Plant (ETP).

2.1.1 Factory Profile:

Company Name: Hypoid Composite Knit Ltd.

Factory Address: 176, South Krishnapur, Rajashan, Savar, Dhaka.

Phone: +88-02-7713933 Fax: +088-22-7713899

Corporate Office: House No.: 21/13, Babar Road, Mohammadpur, Dhaka-1205 Bangladesh.

Phone: +88-02-8123893 Fax: +88-02-9133525

E-mail: hypoidck@yahoo.com

BKMEA Membership Number: 979

Membership Type: Ordinary Member.

Year of Registration: 2006-02-06

Bank: South East Bank Ltd., Kawran Bazar, Dhaka-1215, Bangladesh

SWIFT: SEBDBDDHKRN, E-mail: sebdbk@gononet.com A/C 001511100003467

Production Capacity:

- ❖ Garments: 26,000 Pcs. Per day.
- ❖ Knitting: 05 Tons per day.
- ❖ Dyeing: 11 Tons per day.
- ❖ Finishing: 08 Tons per day.
- ❖ Intimate: 28,000 Pcs Per day.

Factory Area: 6 Acres

Turnover: US\$ 27.00 million. (RMG + Intimate)

2.1.2 Aim and Objective of the factory:

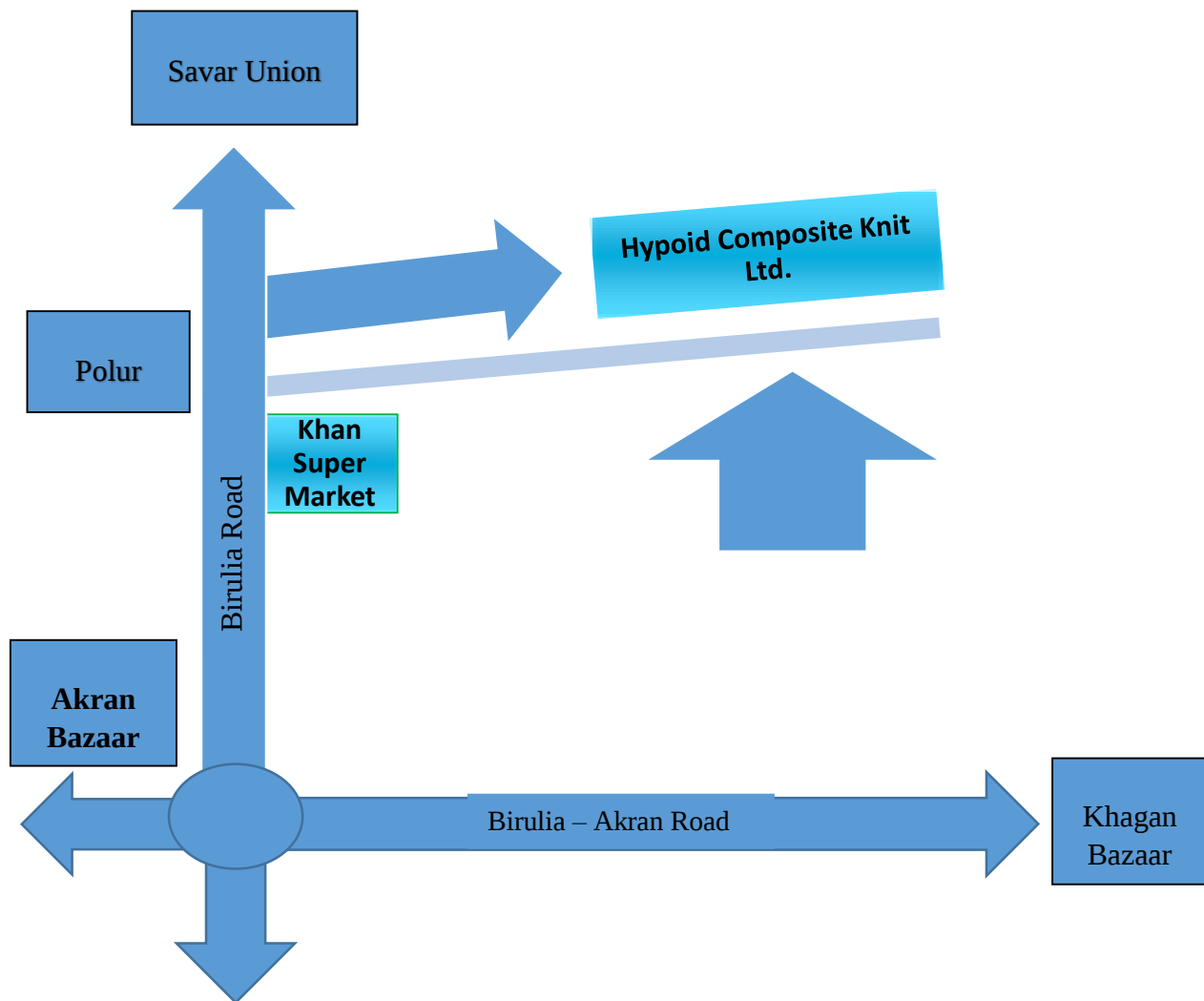
- ❖ To make the factory as a one of leading, modern and up growing textile industry in Bangladesh.
- ❖ They follow all the rules and regulation for made the factory eco-friendly.
- ❖ To follow the all kinds of laws about labor, worker, human right, WTP, ETP, social compliance.

2.1.3 Certification:

- ❖ ISO 9001:2000
- ❖ WRAP, Certificate No.: 10628
- ❖ OEKOTEX: Standard, Test No. 08, ID: HBD.61520
- ❖ BSCI Certified
- ❖ Gots Certified

- ❖ Wall-mart evaluated. Supplier ID: 28084998
- ❖ BGMEA, Registration No.: 4977
- ❖ BKMEA, Registration: 979-A/2006

2.1.4 Location Layout:



2.1.5 View from Google Map:

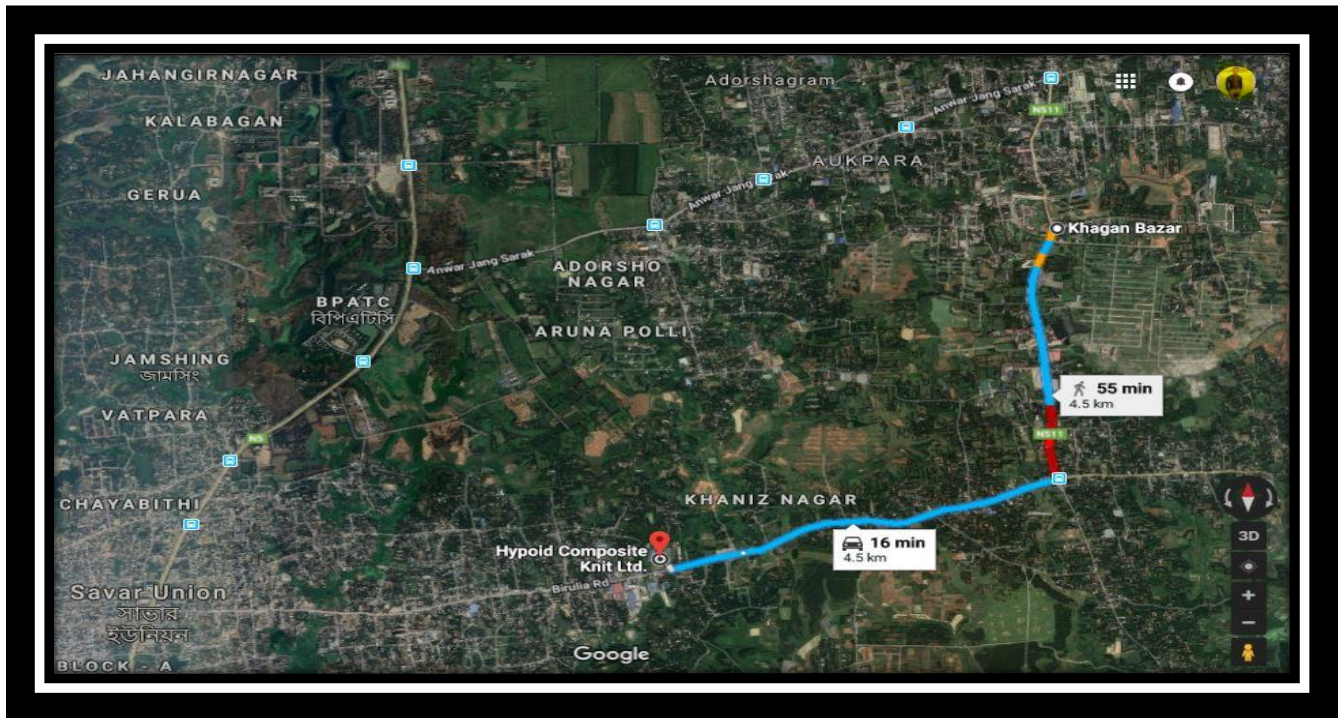
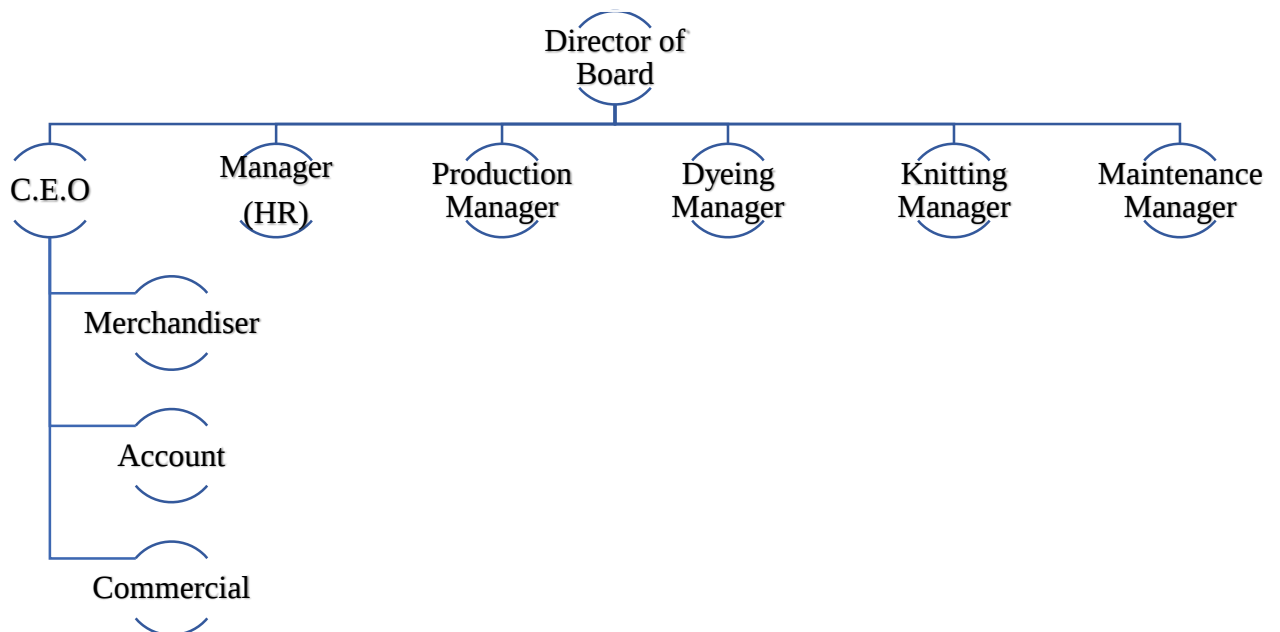


Figure: View from Google Map

2.1.6 Management Process of H C K Ltd:



2.1.7 Achievement

- ❖ BSCI first audit the Hypoid Composite Knit Ltd, DBID: 20609
- ❖ GOTS certificate was taken. ID: 28084998
- ❖ HCKL found OEKI-TEX certificate of Standard Composite Knit Mill in Bangladesh which ID NO is HBD. 61520, Test No 08

2.1.8 Extra facilities providing by the factory:

- ❖ Price oriented.
- ❖ Maintain time study.
- ❖ Short lead time.
- ❖ Maintain social commitment.
- ❖ Maintain buyer requirement.
- ❖ Customer satisfaction.
- ❖ Produce good quality product.

2.1.9 Main Buyer:

- ❖ Gor Factory
- ❖ Indites S.A (zara)
- ❖ Jc penny
- ❖ KIK
- ❖ Main Knitting
- ❖ MJC
- ❖ Multiline
- ❖ NDT
- ❖ Peter Werth
- ❖ Red Cats
- ❖ Walmart

2.2 Producing Garments Product by H C K L:

- ❖ Children's wear
- ❖ Intimate
- ❖ Ladies Wear
- ❖ Polo Shirt (both basic & fancy)
- ❖ Sports Wear
- ❖ Sweat Shirt & Pant
- ❖ T-Shirt (both & fancy)

2.2.1 Producing Fabric by H C K L:

1. 1×1 Rib
2. 100% Cotton 2×2 Rib fabric
3. 100% Cotton Single Jersey
4. 100% Polyester Single Jersey
5. 100% Viscos 2×2 Rib fabric
6. 100% Viscos Single Jersey
7. CVC Fabric (40% Polyester + 60% Cotton)
8. Double Lacoste
9. Double Pique
10. Fleece
11. French Terry
12. Grey Milans Single Jersey (10% Viscose + 90% Cotton)
13. Heavy Single Jersey
14. Interlock
15. Lycra Viscos Single Jersey
16. Modal Fabric (50% Polyester + 50% Cotton)
17. Neps Single Jersey
18. PC (65% Polyester + 35% Cotton)
19. Single Lacoste

- 20. Single Pique
- 21. Slub Single Jersey
- 22. Waffle fabric
- 23. Yarn dyed fabric/Stripe

2.2.2 Source of Raw Material:

Yarn:

All the yarns used from Al Haj Karim Spinning Mills Ltd. also collected from Isaq Spinning Mills, Salek spinning Mills, Korotoya Spinning Mills.

Lycra:

Roica and Spandex from Taiwan.

Imported:

- | | |
|------------------|-------------|
| ❖ Loyal Spinning | ❑ RSWM |
| ❖ Arunchal | ❑ Sumruddha |
| ❖ Precot | ❑ Protiy |
| ❖ Alps | ❑ Cheslind |

CHAPTER-03

DETAILS OF ATTACHMENT

KNITTING SECTION

CHAPTER-3

DETAILS OF ATTACHMENT

3.1 Knitting section:

3.1.1 Introduction

The Process in which fabrics are produced by set of connected loops from a series of yarn in weft or warp direction is called knitting. Knitting fabric consists of consecutive loops, called stitches. The loops are also held together by the yarn passing from one to the next. The process in which fabrics are produces by set of connected loops from a series of yarns in weft or warp direction is called knitting.

In textile, there are two types of stitch used by the manufacturer to produce a knitting product. Such as;

- ✓ Warp knitting
- ✓ Weft knitting

3.1.2 Warp knitting:

When fabric is produced by this method in warp direction then it is called warp knitting.

3.1.3 Weft knitting:

When fabric is produced by this method in weft direction then it is called weft knitting.

Classification of Knitting:

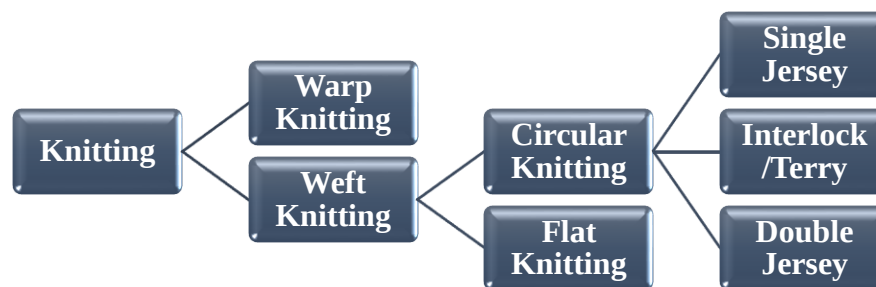
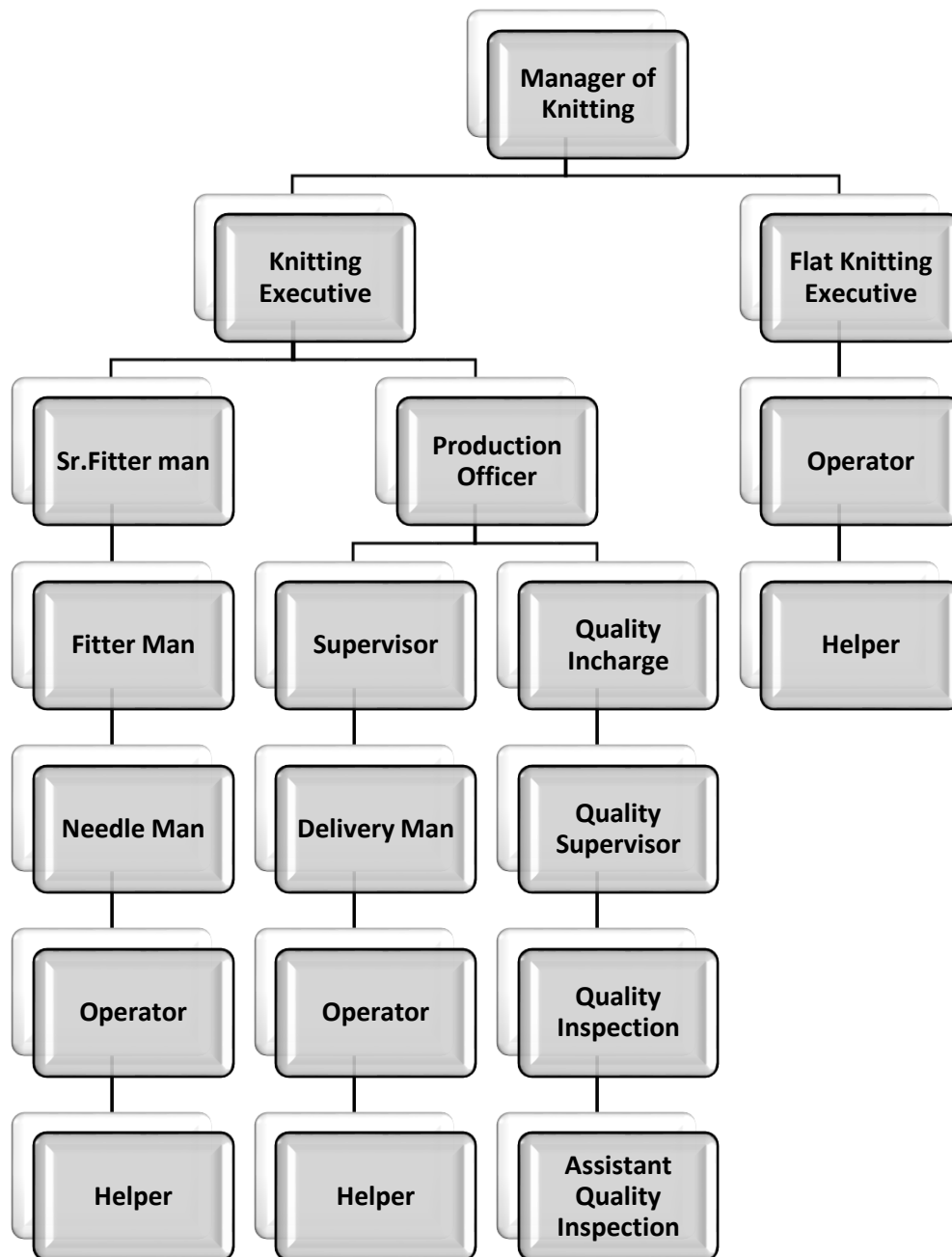


Figure: Classification of Knitting

3.1.4 Management Organogram of Knitting Section:



3.1.5 Layout of knitting section:

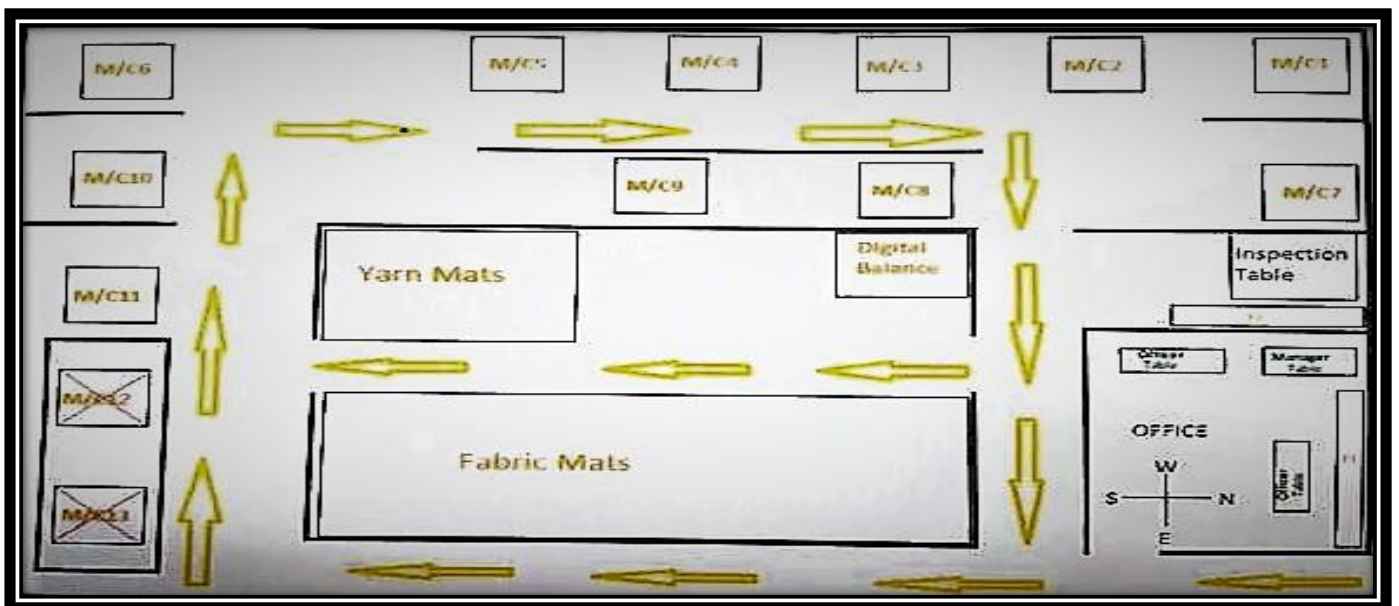
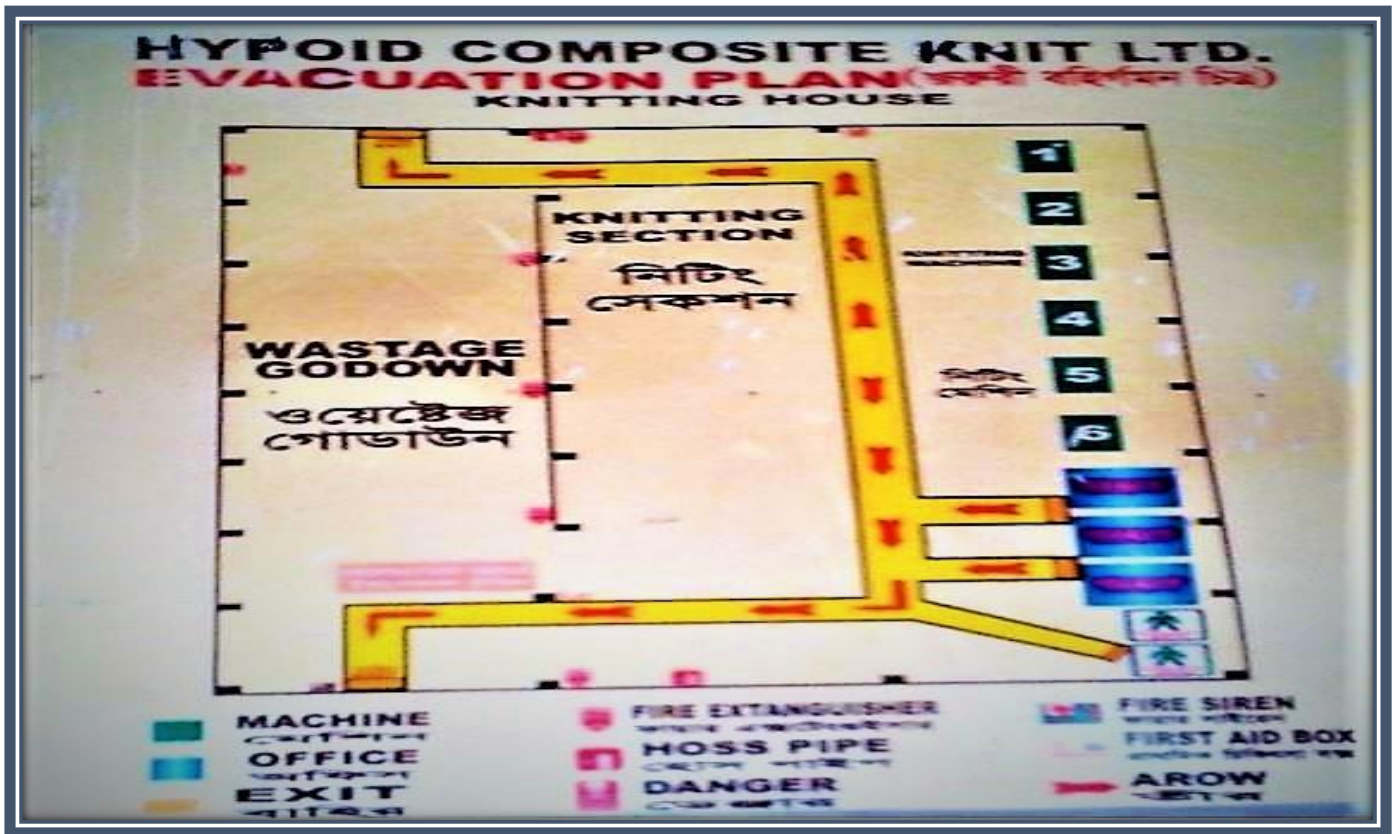


Figure: Layout of Knitting Section

3.1.6 Process Flow Chart of Knitting:

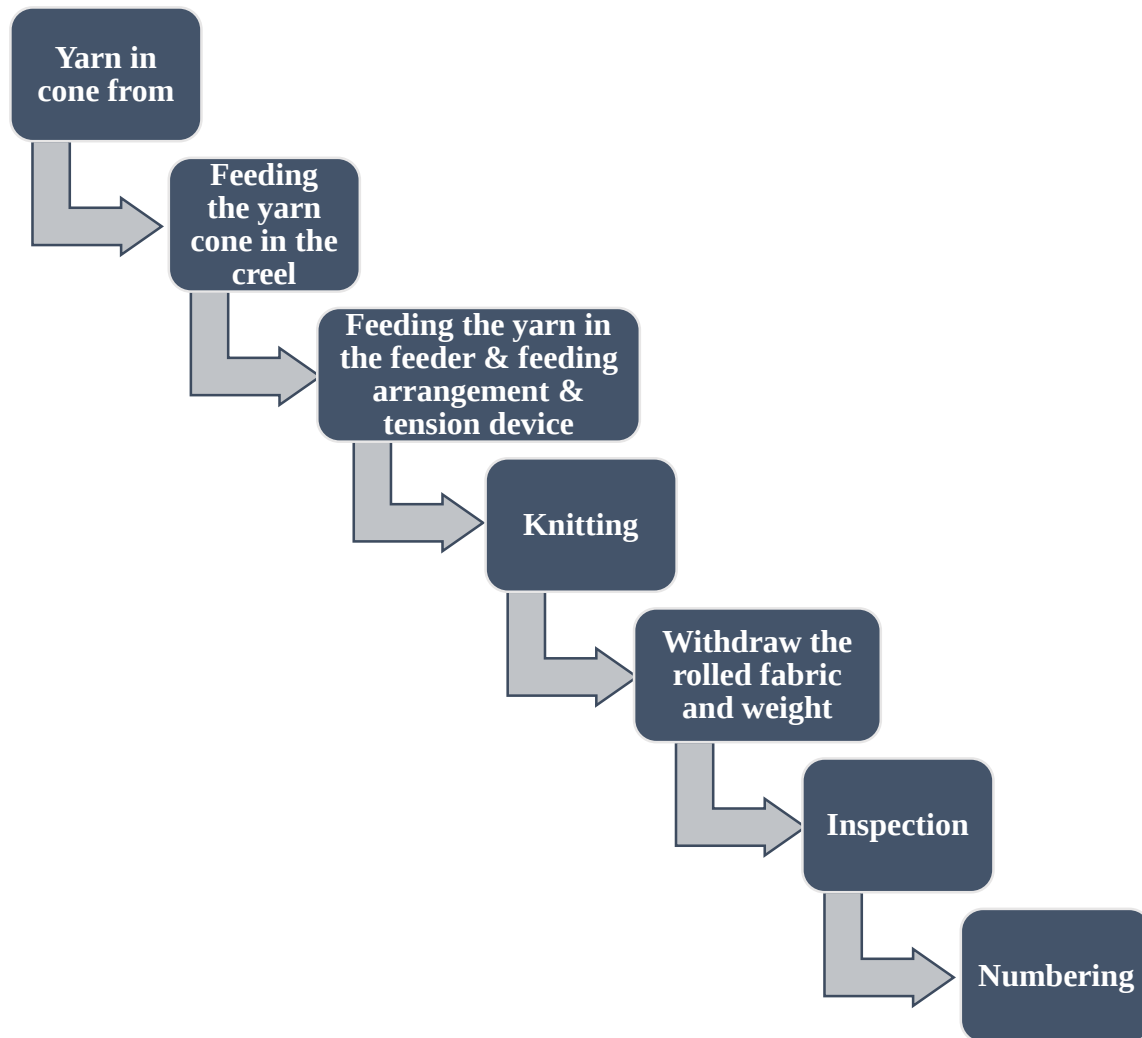


Figure: Process Flow Chart of Knitting

3.1.7 Specification of Machines in knitting section:

Hypoid Composite Knitting Ltd. Knitting unit operated by similar type of machine with different numbers.

Wasted Machine no: 02

Total No. of Machine: 13

Active Machine No :11

➤ **Machine No: 01**

Machine Type: Single jersey circular knitting machine

Brand Name: LISKY

Origin: Made in Taiwan

No. of Feeders: 120

No. of Needle: 2986

Machine Diameter: 38"

Machine Gauge: 24

➤ **Machine No: 02**

Machine Type: Double jersey circular knitting machine

Brand Name: LKM

Origin: Made in Taiwan

No. of Feeders: 90

No. of Needle: 2644

Machine Diameter: 34"

Machine Gauge: 24

➤ **Machine No. 03 & 04 are similar machine to Machine No. 02**

➤ **Machine No: 05**

Machine Type: Double jersey circular knitting machine

Brand Name: LKM

Origin: Made in Taiwan

No. of Feeders: 90

No. of Needle: 2644

Machine Diameter: 30"

Machine Gauge: 18

➤ **Machine No: 06**

Machine Type: Single jersey circular knitting machine

Brand Name: LISKY

Origin: Made in Taiwan

No. of Feeders: 120

No. of Needle: 2856

Machine Diameter: 32"

Machine Gauge: 24

➤ **Machine No: 07**

Machine Type: B.N

Brand Name: LISKY

Origin: Made in Taiwan

No. of Feeders: 120

No. of Needle: 2756

Machine Diameter: 36"

Machine Gauge: 24

➤ **Machine No. 08 is similar machine to Machine No. 07**

➤ **Machine No: 09**

Machine Type: Single jersey circular knitting machine

Brand Name: LISKY

Origin: Made in Taiwan

No. of Feeders: 120

No. of Needle: 2544

Machine Diameter: 34"

Machine Gauge: 24

➤ **Machine No. 10 is similar machine to Machine No. 06**

➤ **Machine No. 11 is similar machine to Machine No. 09**

➤ **Machine No. 12 & 13 Wasted**

3.1.8 End Products of circular Knitting m/c:

3.1.8.1 Single Jersey M/C:

❖ Double Lacoste

❖ Elastane Single Jersey

- ❖ Polo Pique
- ❖ Single jersey
- ❖ Single Lacoste
- ❖ Three Thread Elastane Fleece
- ❖ Three Thread Fleeces
- ❖ Two Thread Elastane Fleece
- ❖ Yarn Dyed Single Jersey

3.1.8.2. Double Jersey M/C:

- ❖ 1×1 Elastane Rib
- ❖ 1×1 Rib
- ❖ 2×2 Elastane Rib
- ❖ 2×2 Rib
- ❖ Interlock
- ❖ Mesh
- ❖ Yarn Dyed Rib

3.1.9 Factors concerned with Knitting:

- ❖ Finished GSM
- ❖ Finished width
- ❖ Lycra%
- ❖ Machine dia
- ❖ Machine gauge
- ❖ Stitch length
- ❖ Yarn count
- ❖ Yarn tension during feeding

3.2 Points Should Be Considered for GSM Changing:

- ❖ Cam Position.
- ❖ Machine gauge.

- ❖ Take up motion.
- ❖ VDQ (Variable dia, Quality control) Pulley diameter.
- ❖ Yarn Count.

3.2.1 Factors That Should Be Considered for Changing of Fabric Design:

- ❖ Cam arrangement.
- ❖ Needle Butt setting & Needle dropping.
- ❖ Size of the loop size.
- ❖ Using of different colors in selected feeder.

3.2.2 Different parts of knitting Machine:

- ❖ **Air gun:** To pass the through the yarn into the tube.
- ❖ **Cam box:** To store the cam.
- ❖ **Cam:** Mainly three types of cams are used in knitting production such as miss cam, knit cam & tuck cam. To bring variations in knitting production they play a vital role.
- ❖ **Creel:** creel is used to place the cone.
- ❖ **Cylinder:** vertical needle & cam arrangement.
- ❖ **Feeder:** feeder is used to feed the yarn to needle.
- ❖ **Guide:** Guide is used to guide the yarn.
- ❖ **Motor:** To help the running machine.
- ❖ **Needle:** To hold the formation of loop. Generally, latch needle is used.
- ❖ **Oil box:** To help the machine smooth the machine.
- ❖ **Positive feeder:** To store the yarn.
- ❖ **Sensor:** sensor is Used to see if any yarn has been torn out & the machine stops when any problem occurs.
- ❖ **Sinker:** Sinker is mainly performing three functions such as holding down, knocking over & loop formation.
- ❖ **Spreader:** Spreader is used to spread the knitted fabric before take up roller.
- ❖ **Suction fan:** To clean the dust, dirt & other impurities.
- ❖ **Take up roller:** Take up roller is used to take up the fabric.

- ❖ **Tension meter:** To control the yarn tension.
- ❖ **Tensioning device:** Tensioning device is used to give proper tension to yarn.
- ❖ **VDQ pulley:** VDQ pulley is used to control the GSM by controlling the stitch length.

3.2.3 Yarn used for knitting process:

Types of Yarn	Count
Cotton	16 to 40
CVC	16 to 40
PC (60% Polyester & 40% Cotton)	20 to 40
Grey Melange (90% C & 10% V)	20 to 40
100% Polyester	20 to 40
100% Viscos	20 to 40

3.2.4 Production calculation of Knitting:

A. Production/ Shift in kg at 100% efficiency:

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

B. Production/ Shift in meter Course/ min:

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

C. Fabric width in meter:

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

3.2.5 Fabric Inspection (4-Point system):

Defect length	Penalty Point
Less than 3 inch/75 mm	01
Less than 3-6 inch/ 75-149 mm	02
Less than 6-9 inch /149-229 mm	03
Less than 9 inch/230 mm	04
Any Holes	04

3.2.6 Knitting Check list:

- ❖ Buyer
- ❖ Order No.
- ❖ Roll No.
- ❖ Machine dia, Machine No., Finished dia
- ❖ Yarn count & Yarn check
- ❖ Fabrication check
- ❖ Lycra tension
- ❖ Thick & Thin check
- ❖ Lycra cotton catta
- ❖ Needle mark check
- ❖ Sinker mark check
- ❖ Dia mark check
- ❖ Crease mark check
- ❖ Wheel mark check
- ❖ Yarn contamination
- ❖ GSM
- ❖ Other faults

3.2.7 Faults, Causes & Their Remedies in Knitting:

1. Hole:

Causes:

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

Remedies:

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

2. Needle Mark:

Causes:

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

Remedies:

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

3. Sinker's Mark:

Causes:

- ❖ If sinker head bend, then sinker mark comes.
- ❖ When sinker corrodes due to abrasion then needle mark comes along the fabrics.

Remedies:

- ❖ Sinker should be changed.

4. Lycra catta:

Causes:

- ❖ Lycra catta is the result of due to the containing of dust in the feeder.

Remedies:

- ❖ Clean the feeders before feeding the yarn.

5. Lycra out:

Causes:

- ❖ During running machine if Lycra fall down from Lycra pulley, as a result scrubber doesn't work well and Lycra out occurs.

Remedies:

- ❖ Ensure that scrubber does work well.
- ❖ Lycra should be set well on Lycra pulley.

6. Star:

Causes:

- ❖ Buckling of the needle latch.
- ❖ Low GSM fabric production.
- ❖ Yarn tension variation during production.

Remedies:

- ❖ Maintain same yarn tension during production.

- ❖ Use good conditioned needle.

7. Set up:

Causes:

- ❖ If RPM of machine is excessively high.
- ❖ If the yarn quality Is low.
- ❖ If yarn is broken during running.
- ❖ If yarn is not properly fed during loop formation i.e. not properly laid on to the needle hook.

Remedies:

- ❖ Limited RPM of machine.
- ❖ Yarn has to be properly fed.

8. Oil stain:

Causes:

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

Remedies:

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

9. Crease mark:

Causes:

- ❖ If belt setting of rollers is low.

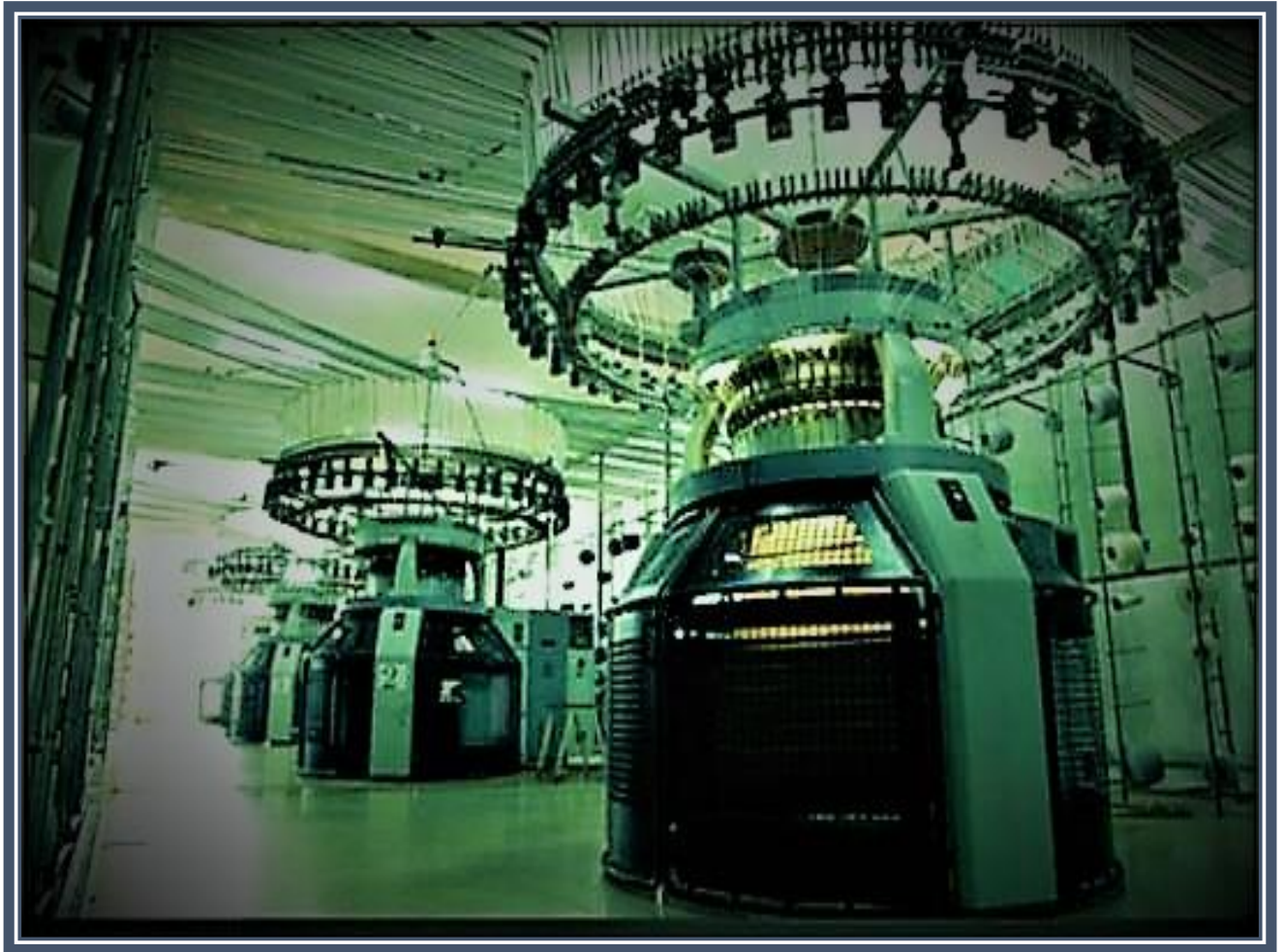
Remedies:

- ❖ Proper setting of belt as well as proper maintenance.

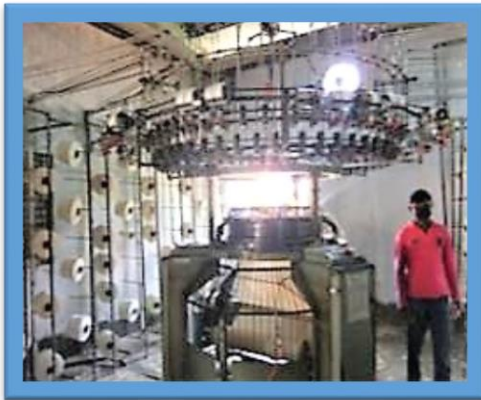
3.2.8 Shift Change:

Shift of twelve hours. Shift change after a week on Saturday.

3.2.9 Photo of Knitting Machine:



Knitting Machine



Circular knitting machine



Cam



Spandex yarn arrangement on creel



Creel arrangement



Production measuring after knitting

Figure: Photo of Knitting Section

3.3 Fabric Type:

Grey Milans Single Jersey (10% Viscose + 90% Cotton)	
Terry	
Fleece	
1×1 Rib	
Neps Single Jersey	

Single Pique	
Double Pique	
PC (60% Polyester + 40% Cotton)	
Modal Fabric (50% Polyester + 50% Cotton)	
CVC Fabric (60% Cotton + 40% Polyester)	

Waffle fabric	
Slub Single Jersey	
100% Cotton 2×2 Rib fabric	
Yarn dyed fabric	
Single Lacoste	

100% Viscos 2×2 Rib fabric	
100% Viscos Single Jersey	
100% Cotton Single Jersey	
Lycra Viscos Single Jersey	
Slub Fabric	

Double Lacoste	
Interlock	
100% Polyester Single Jersey	
Heavy Single Jersey	

DYEING LABORATORY SECTION

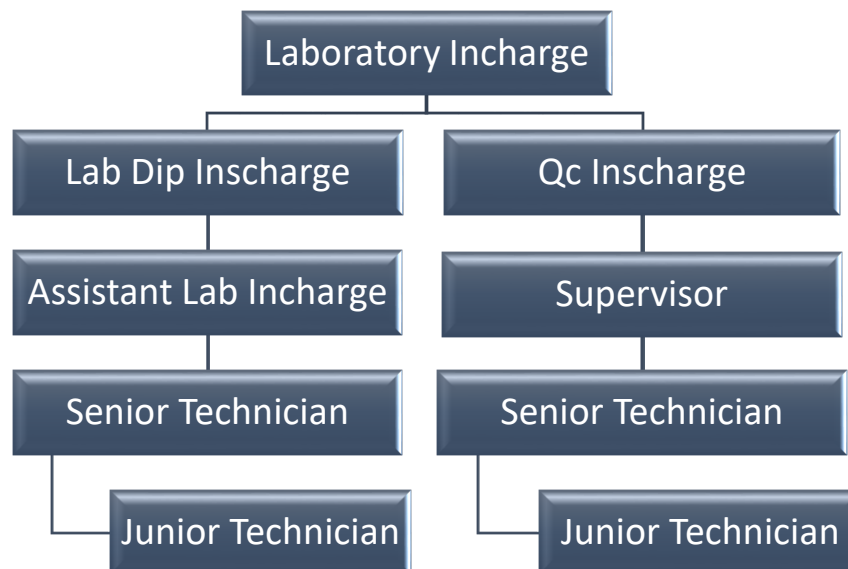
3.4 Lab Dip Development:

Mainly lab dip development means where the sample are developing according to the buyer requirement. In lab dip development, sample is dyeing according to the buyer requirement then match with swatch card sample and then take an approval from buyer. Further Bulk production is dyeing according to the development sample.

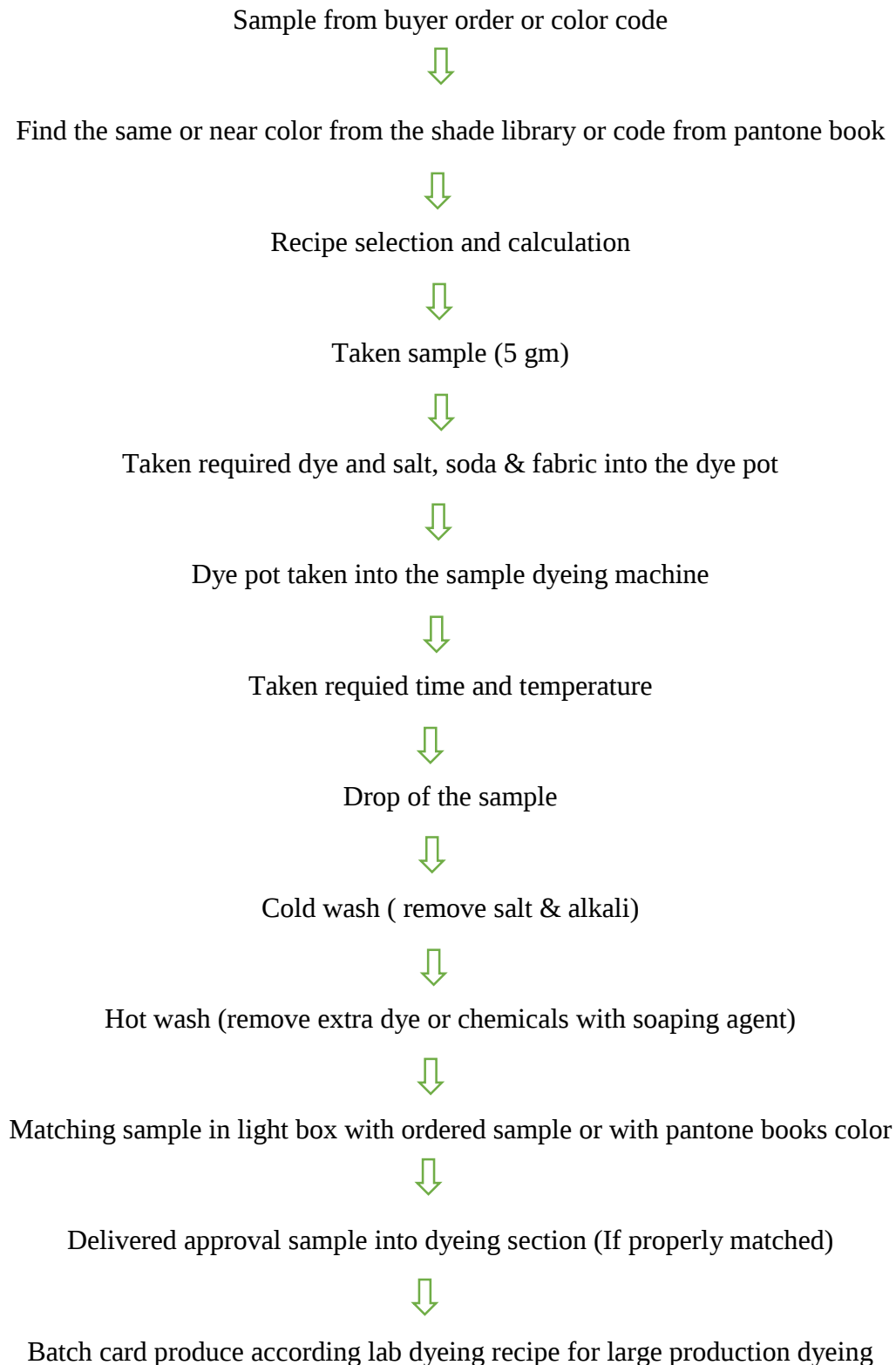
3.4.1 Objectives of lab dip development:

- Approved the sample.
- Grading the sample. (A, B, C)
- To calculated the recipe for sample dyeing
- To checking shade of the dying sample with swatch card sample by spectrophotometer.

3.4.2 Organogram of Laboratory:

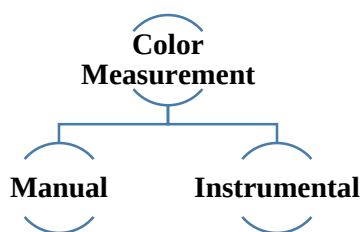


3.4.3 Developing sequence of Lab dip in H C K L:



3.4.4 Color measurement of standard sample:

Color measurement of standard sample is done by matching shade of standard sample with developing sample. And shade matching of produce sample is compulsory. It is done by two methods, such as



- In manual method this process is completely depends on vision of person. This process is done by matching shade of standard sample with previous producing sample in lab dip. The person who doing this process needed experience for this process.
- Instrumental method is doing by using spectrophotometer and a PC to matching the shade of the sample.

3.4.5 Preparation of stock dyes solution:

Dyes and chemicals Measuring Formula for Laboratory:

The amount of dye solution (ml) is calculation as follow:

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

Example:

In Recipe, Fabric wt. = 5 gm

Shade% = 2%

[If used 0.5% stock solution of dye]

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

$$\diamond \text{ Amount of chemical solution (ml)} = \frac{\text{Fabric wt} \times M:L \times g/l}{1000 \times \text{concentration of stock solution}}$$

Example:

In Recipe, Fabric wt. = 5 gm

Salt = 20 g/l

M: L= 10

[If taken 25% stock solution of salt]

$$\text{Amount of chemical solution (ml)} = \frac{5 \times 10 \times 20}{1000 \times .25} = 4 \text{ ml}$$

3.4.6 Stock solution preparation:

Preparation of concentration of stock dye solution:

Normally 0.1%, 0.5%, 1%, 2% and 4% stock solution of dyes are prepared in beakers for daily used.

Preparation of concentration of stock chemical solution similarly 25% salt and 25% soda stock solutions are prepared in beakers for daily use.

3.4.7 Machine used in Lab dip:



Light Box



Crock Meter



Data Color Machine



Dyeing Machine



Washing Machine



Sample Drying Machine



Rota Wash Machine



Wash Color Machine



Rapid Dyeing Machine



Different Color Dyeing & Electronic Balance

Figure: Machineries used in lab dip

BATCHING SECTION

3.5.1 Grey Store:

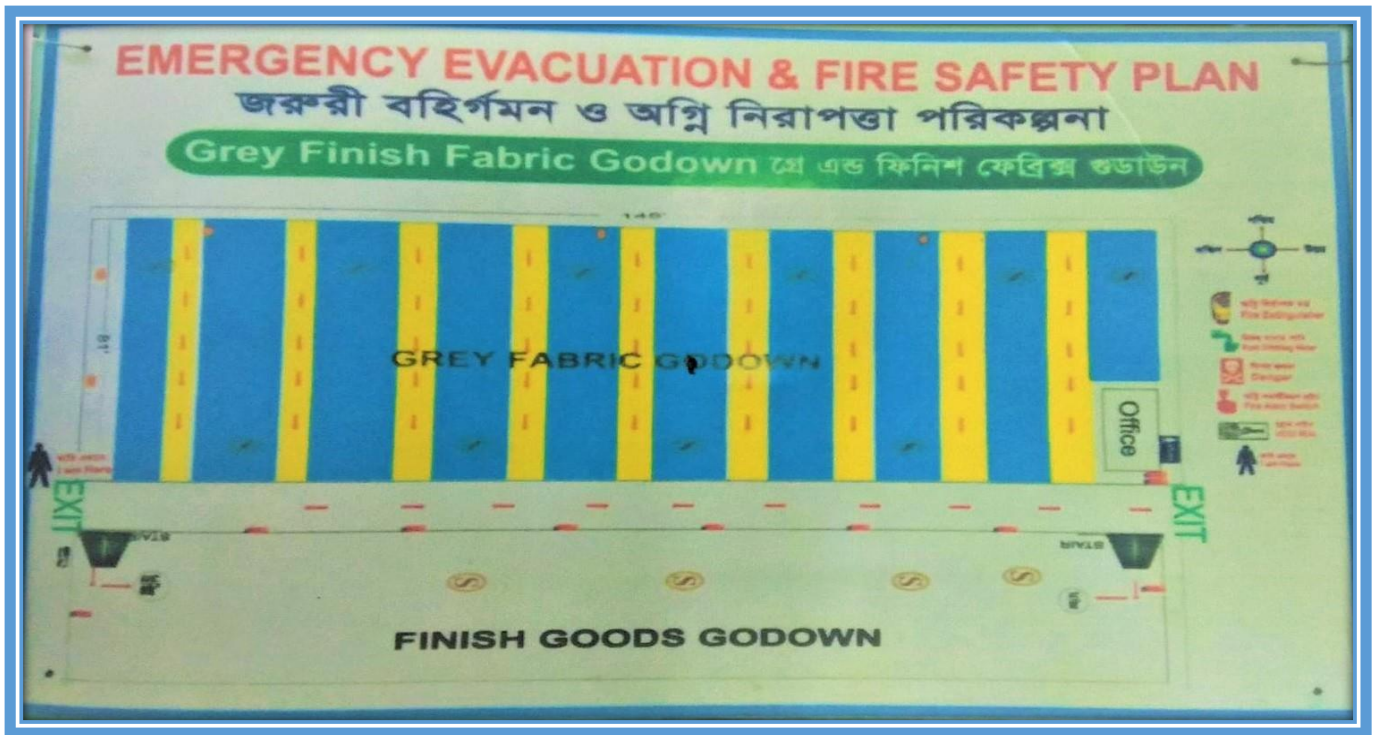


Figure: Layout of Grey and Finish go down

3.6 Batching Section:

Batching preparation is the process where visually inspected grey fabrics are divided into different batches with reasonable quality in order to make them suitable for the further operation.

3.6.1 Organogram of Batch Section:



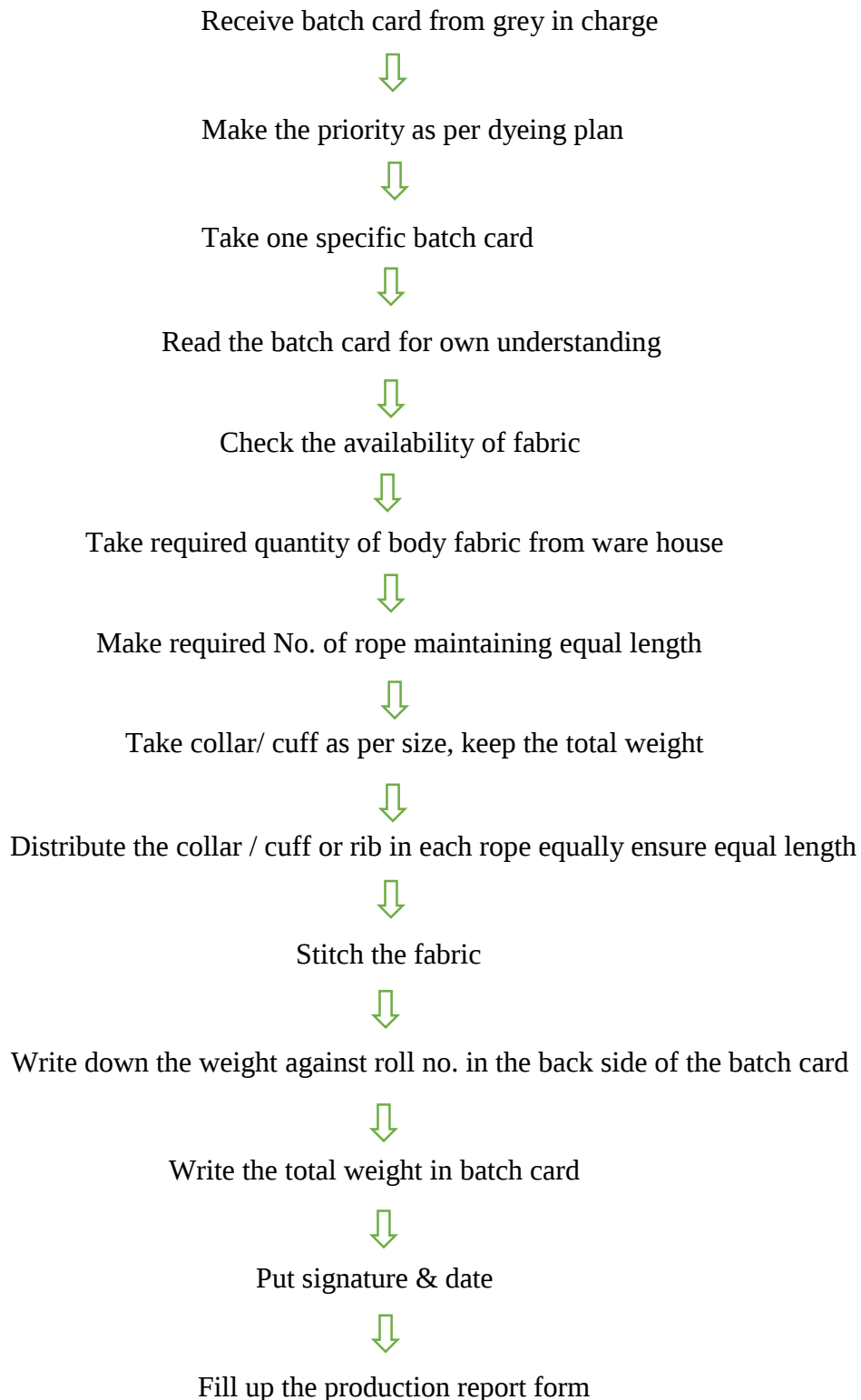
3.6.2 During batching following factors are considered:

- ❖ Capacity of available machines
- ❖ Fabric quality
- ❖ Ordinary priority
- ❖ Yarn Dyed
- ❖ Yarn type

3.6.3 Function or purpose of the batch:

1. To receive the grey fabric, roll from knitting section or another source.
2. To prepare the batch of fabric for dyeing according to the following parameter:
 - ❖ Order sheet. (Received from buyer)
 - ❖ Dyeing shade. (color or white, light or dark)
 - ❖ Machine Capacity.
 - ❖ Fabric structure.
 - ❖ Yarn type & Etc.
3. To send the grey fabric to the dyeing floor by trolley with batch card.
4. To keep records for previous dyeing.

3.6.4 Process Sequence of Batch Preparation:



3.6.5 Machine use in Batching:



Fabric stored for Batching



Turning Machine



Batch Sewing Machine

Figure: Batch Section & Machine use

DYEING SECTION

3.7 Dyeing Section:



Figure: Layout of dyeing section

3.7.1 Management personal of dyeing section:



3.7.2 Sample Machine:

Sample Machine No.: 01

Name of Machine: Which dyeing machine.

Brand: Tong Geng

Origin: Taiwan

Capacity: 10 kg

Temperature: Up to 100°C

Sample Machine No.: 02

Name of Machine: Which dyeing machine.

Brand: Tong Geng

Origin: Taiwan

Capacity: 15 kg

Temperature: Up to 100°C

Sample Machine No.: 03

Name of Machine: Which dyeing machine.

Brand: Tong Geng

Origin: Taiwan

Capacity: 15 kg

Temperature: Up to 100°C

Sample Dyeing Machine No.: 04

Name of Machine: Which dyeing machine.

Brand: Tong Geng

Origin: Taiwan

Capacity: 30 kg

Temperature: Up to 140°C

3.7.3 Production Machine:**Machine No.: 01**

Name of Machine: Which dyeing machine.

Brand: Tong Geng

Origin: Taiwan

Capacity: 50 kg

Temperature: Up to 140°C

Machine No.: 02

Name of Machine: Which dyeing machine.

Brand: Tong Geng

Origin: Taiwan

Capacity: 200 kg

Temperature: Up to 140°C

Machine No.: 03

Name of Machine: Which dyeing machine.

Brand: Tong Geng

Origin: Taiwan

Capacity: 400 kg

Temperature: Up to 140°C

Machine No.: 04

Name of Machine: Which dyeing machine.

Brand: Tong Geng

Origin: Taiwan

Capacity: 600 kg

Temperature: Up to 140°C

Machine No.: 05

Name of Machine: Which dyeing machine.

Brand: Tong Geng

Origin: Taiwan

Capacity: 800 kg

Temperature: Up to 140°C

Machine No.: 06

Name of Machine: Which dyeing machine.

Brand: Tong Geng

Origin: Taiwan

Capacity: 800 kg

Temperature: Up to 98°C

Machine No.: 07

Name of Machine: Which dyeing machine.

Brand: Tong Geng

Origin: Taiwan

Capacity: 400 kg

Temperature: Up to 98°C

Machine No.: 08

Name of Machine: Which dyeing machine.

Brand: Tong Geng

Origin: Taiwan

Capacity: 200 kg

Temperature: Up to 98°C

Machine No.: 09

Name of Machine: Which dyeing machine.

Brand: Tong Geng

Origin: Taiwan

Capacity: 1000 kg

Temperature: Up to 140°C

Machine No.: 10

Name of Machine: Which dyeing machine.

Brand: Tong Geng

Origin: Taiwan

Capacity: 1200 kg

Temperature: Up to 140°C

3.7.4 Raw Material for Dyeing:

- ❖ Grey Fabric
- ❖ Chemicals
- ❖ Dyes

3.7.5 Grey Fabric:

Following types of grey fabrics are dyed

- ❖ Single Jersey.
- ❖ Lycra Single Jersey.
- ❖ Slub Single Jersey.
- ❖ Interlock.
- ❖ Pique.
- ❖ Rib

- ❖ Lycra Rib
- ❖ 1×1 Rib
- ❖ 2×1 Rib
- ❖ 2×2 Rib

Sources:

The grey fabrics are producing from this industry. All the grey fabrics that are produce from this industry are dyed in dyeing section. After fulfill all order of this industry sometime they dyed fabric in sub contact.

3.7.6 Chemical Used in H C K Ltd.:

Aids	Chemical Name
General Chemicals	Caustic Soda
	H ₂ O ₂
	Glouber Salt
	Common Salt
	Hydrose (BASF)
	Soda Ash Light
	Detergent (E-Wet 104)

Acid	Acetic Acid (Mat acid)
	Buffer Acid
Softener	Cationic Softener (SunSoft)
	Non-Ionic Softener (Belsoft-200)
	Resoft NS-(White Softener)
	Power Soft-180
	Softner V-16
	Silicon (Weaker)
	Silicon (Resomine- 3000)
Anticrease	Anticrease (Exolnbe-AC)
	Rybypon-173
	Leancrease-651
	Cotton Leveling (Exoline Fast)

Leveling Agent	Lianleve 1723 (Cotton)
	Rubygal CFTR(Cotton)
	Polyester Leveling (Polyexx-PDL)
Bleaching Agent	Alpclean (Viscose)
Sequestering Agent	Sequestering (Neocrystal-Bc-375)
	Kappa Quest –FE
	Brusquest –E
	Lianseq-710
Soaping Agent	Wash of Agent (Eskudu)
	Ruby soap-BIF
	LASSOP
Optical Brightener	Brightener (Syno White-48k)
	Texbrite 4-BK

	Biltex ERH
Fixing Agent	Color Fix NOF (Fixing)
	Leanfix-706
Peroxide Killer	Matzyme- VHK(Peroxide Killer)
	VEXPOK-100
Peroxide Stabilizer	Lian-PS-66
	Peroxide Stabilized-SE
Others	Enzyme
	Oil Remover (Matclean OSR)

3.7.7 Dyes Used in H C K Ltd.:

Brand Name	Origin	Dyes Name
		Remazole Red-RR
		Remazole Yellow-RR

Remazol	India	Remazole Blue-RR
		Remazole Brill Blue-R Special
		Remazole Turquoise Blue-G
		Remazole Orange-RR
Synozole	Korea	Synozole white 4BK
		Synozole Yellow K3RS
		Synozole Red K3BS
		Synozole Navy Blue KBF
		Synozole Blue KBF
		Synozole Red- HB
		Synozole Yellow- HB
		Synozole Navy Blue- HB
		Dyhufix Red 3BXF

Dychufix	China	Dychufix Yellow 3RXF
		Dychufix Yellow 4 GL
		Dychufix Black BHC
		Dychufix Orange 2RXF
		Dychufix Black FWN
Disperse	China	Disperse Red 60 BFY
		Disperse Yellow- 4G
		Disperse Blue 562 RL
		Disperse Blue 60 BGF
		Disperse Navy Blue ECOG
		Disperse Black ECOG
		Dis- Orange - HF
		Dis- Red - HF

		Dis- Black- HF
		Dis- Navy Blue- HF
		Dis- Blue - HF
		Dis- Yellow - HF
Corazole	India	Cor- Yellow RD
		Cor- Red RD
		Cor- Blue RD
		Cor- Orange RD
		Cor- Turquoise Blue G
		Cor- Bri- Blue-R-SP
		Cor- Bri- Blue-BB
Libafix	Germany	Libafix- Amber CA
		Libafix First Red CA
		Libafix-Blue CA

Recipe for Machine Wash

Detergent	0.5 gm/l
Caustic	01 gm/l
Hydrous	02 gm/l

3.7.8 Some dyeing Parameters used in dyeing:

For PH	
During the bleaching and Scouring	11-23
During Enzyme Treatment	4.5-5
Before Addition of Leveling agent	6-6.6
Before Additional of Color Softener	6-6.5
Before Addition of White Softener	4.5-6
Softener at Stenter Machine	5.5-6
Silicon Softener	5.5-6
Reactive Dyeing	11-12

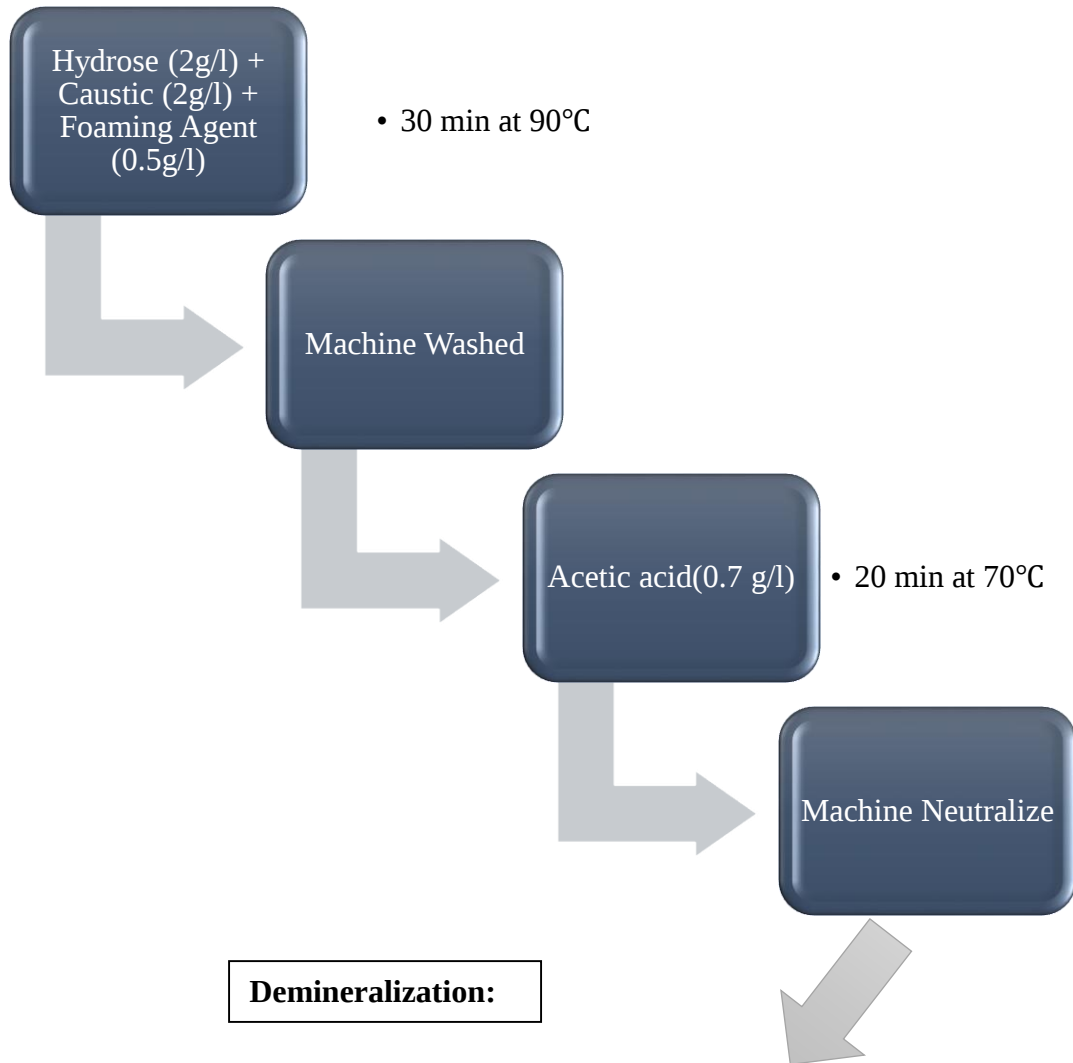
For Temperature	
For Cotton Scouring	90-98°C
For Cotton Cold Wash	60-70°C
For Cotton Hot Wash	80-90°C
For Cotton Acid Wash	50-60°C
For Cotton Dyeing	For hot Brand 80°C & 60°C for Cold Brand

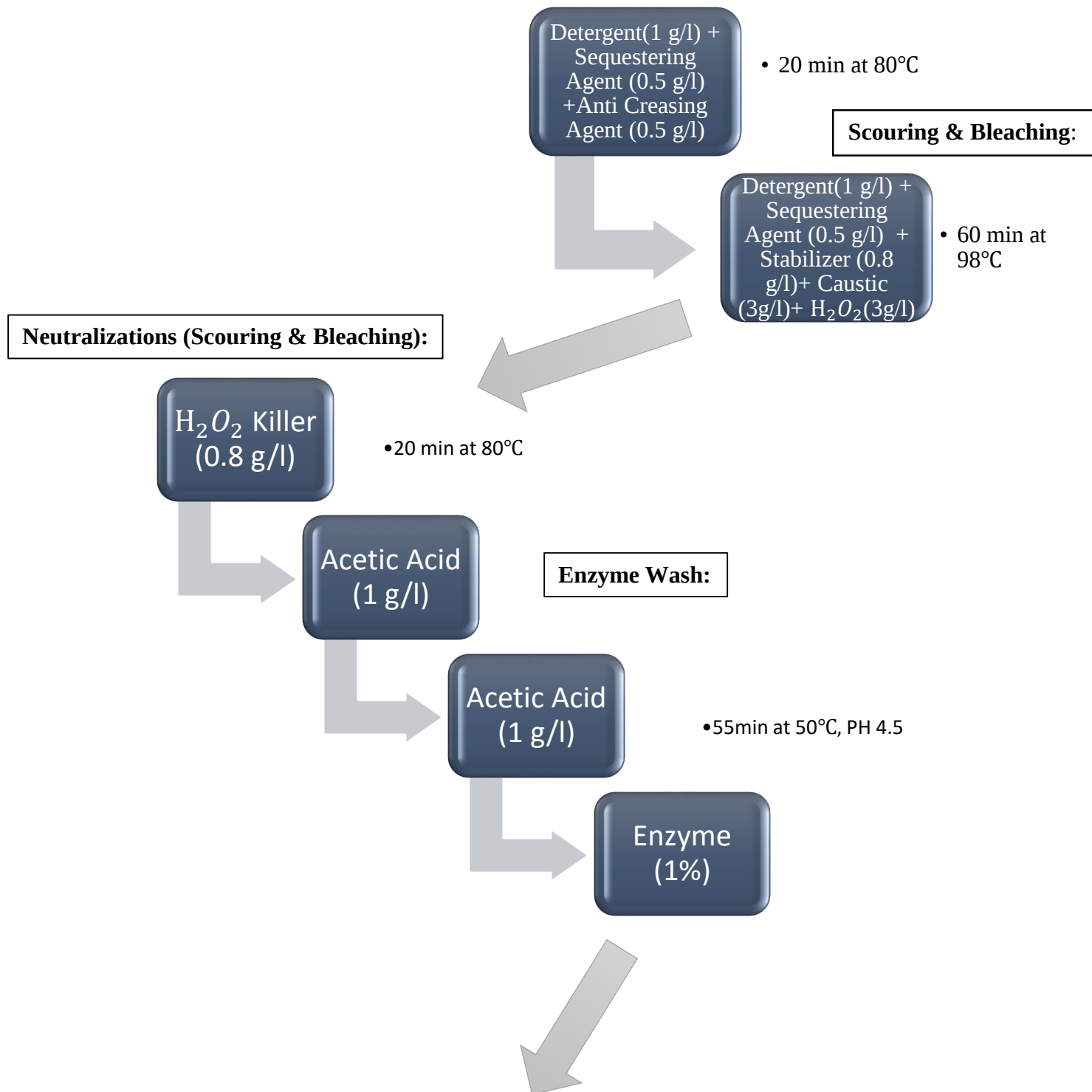
For Time	
For Scouring & Bleaching	60-70 min
For Reactive Dyeing	60-80 min
For Disperse Dyeing	60-70 min

3.7.9 Dyeing Sequence with Recipes:

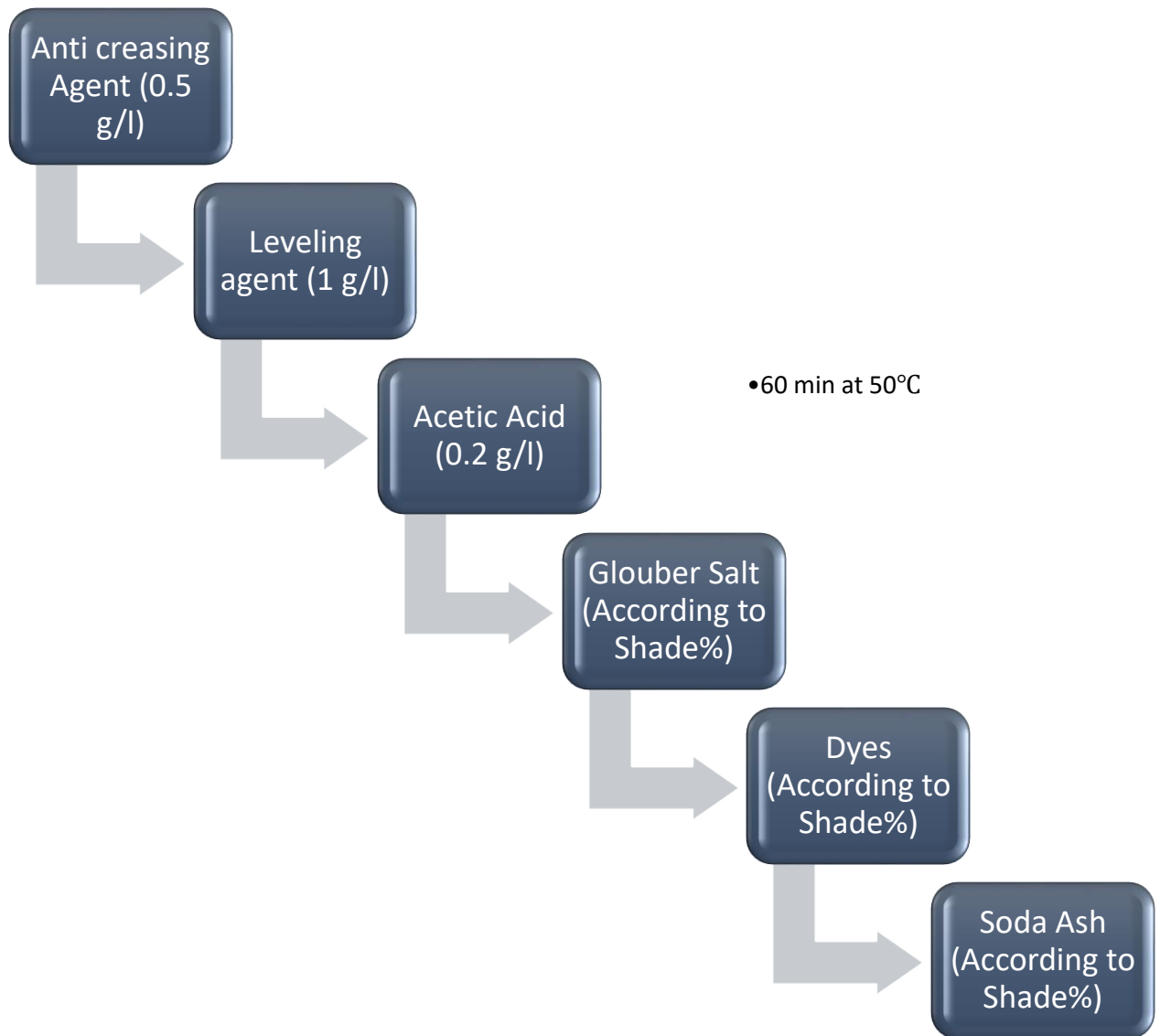
Light Color Process 100% Cotton:

Machine Wash:

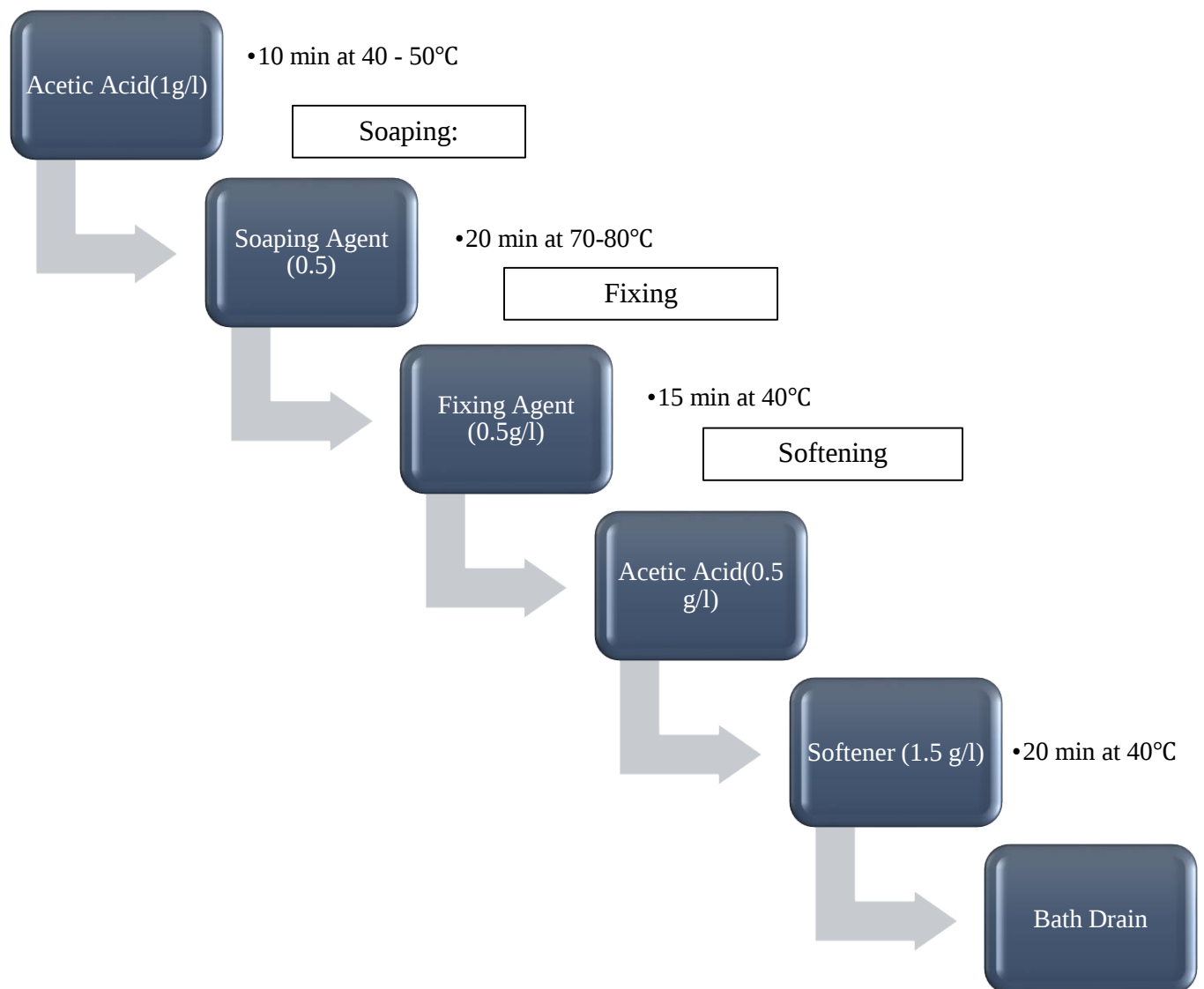




Dyeing:



Neutralization Dyeing:



3.8 Common Faults and Remedies:

Crease Marks:

Crease:

- ❖ Poor opening of the fabric rope.
- ❖ Incorrect Process Procedure
- ❖ Due to high speed of machine running.

Remedies:

- ❖ Pre-Heating
- ❖ Reduce the machine load
- ❖ Higher Liquor Ratio
- ❖ Running at higher nozzle pressure calculation

Fabric Distortion:

Causes:

- ❖ To high materials
- ❖ Low liquor

Remedies:

- ❖ By decreasing nozzle pressure
- ❖ By decreasing speed

Pilling:

Causes:

- ❖ Higher speed during process
- ❖ To high mechanical stress on fabric surface.

Remedies:

- ❖ By maintaining the Proper speed

Uneven Dyeing:**Causes:**

- ❖ Uneven pretreatment
- ❖ Uneven heat setting in case of synthetic fiber
- ❖ Less control of dyeing machine
- ❖ Improper color or chemical

Remedies:

- ❖ By ensuring pretreatment
- ❖ By proper addition of color and chemical
- ❖ By controlling the dyeing machine properly
- ❖ By ensure the uneven heat

Shad variation batch to batch:**Causes:**

- ❖ Improper dyes and chemicals
- ❖ Batch to batch weight variation of fabric
- ❖ Incorrect pretreatment
- ❖ Improper liquor ratio

Remedies:

- ❖ Proper dyes and chemical used.
- ❖ By Correcting the pretreatment process
- ❖ By maintaining batch to batch weight variation.
- ❖ By proper dosing color and chemicals

Dye Sport:**Causes:**

- ❖ Improper temperature
- ❖ Improper dissolved of dying partial
- ❖ Improper chemical used

Remedies:

- ❖ By proper dyeing and chemical
- ❖ By Proper temperature
- ❖ By ensuring proper after treatment

Softener Mark:**Causes:**

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

Remedies:

- ❖ By proper speed reel and pump
- ❖ By ensuring proper temperature
- ❖ By Proper mixing the softener before addition

3.8.1 Same Picture of dyeing section:



Figure: Winch Dyeing Machine (1 Nozzle)



Figure: Winch Dyeing Machine (2 Nozzle)



Figure: Winch Dyeing Machine (3 Nozzle)

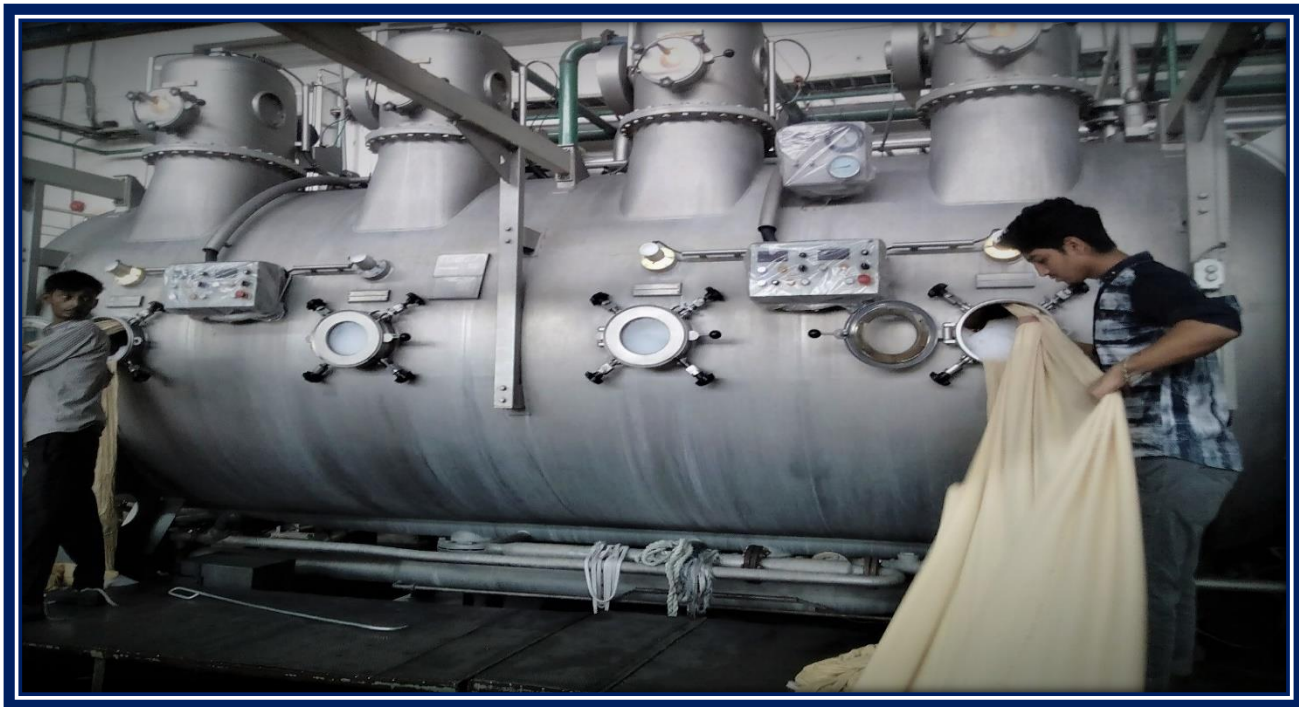


Figure: Winch Dyeing Machine (4 Nozzle)

FINISHING SECTION

3.8.2 Finishing Section:

3.8.3 Machine description of finishing section:

SL. No.	Machinery	No, of Machine	Brand	Origin
01	Slitting Machine	01	Bianco	Italy
02	Slitting Machine	02	ACC	Turkey
04	Stenter machine	01	Sun Trading	Korea
05	Open Compactor	01	Sun Trading	Korea
06	Dryer	01	Ruckh	Germany
07	Dryer	01	Dilmernler	Turkey

3.8.4 Objectives of different finishing Machine:

Slitting Machine:

- ❖ To Open tube fabric according to specific needle mark.

Stenter Machine:

- ❖ Heat setting
- ❖ Width Control, Finishing Chemical application
- ❖ Loop Control
- ❖ GSM Control

Compactor Machine:

- ❖ Shrinkage control

- ❖ GSM control
- ❖ Width control

Dryer Machine:

- ❖ To Control the vibration which increase the GSM
- ❖ To dry the fabric
- ❖ To Control the overfeed system.

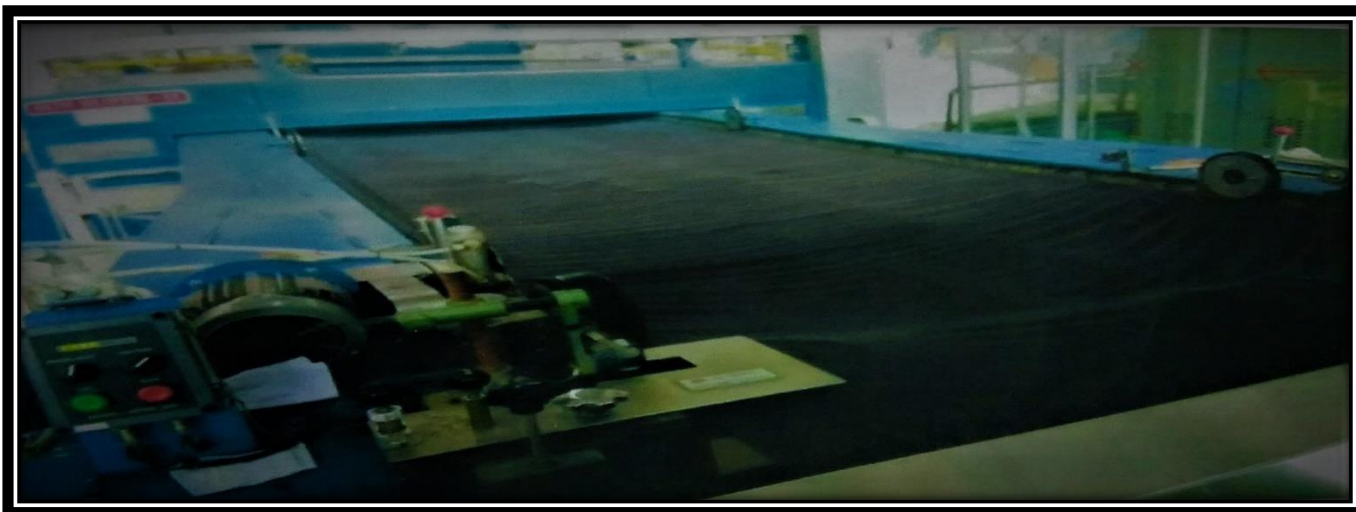
3.8.5 Picture of Finishing Machine:





Stenter Machine





Compacting Machine



Tumble Drying Machine

Figure: Finishing Machineries

3.8.6 Quality Control:

3.8.7 Introduction:

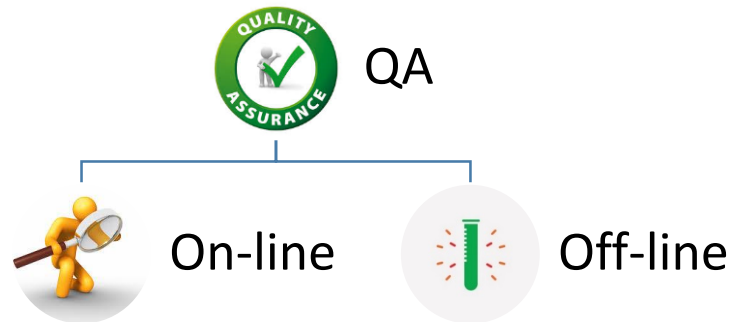
Quality control is a process employed to ensure a certain level of quality in a product or service. It may include whatever actions a business deems necessary to provide for the control and verification of certain a characteristic of a product or service. The basic goal of quality control is to ensure that the product, service or processes provided meet specific requirements and are dependable satisfactory.

Essentially quality control involves the examination of a product, service or process for certain minimum levels of quality. The goal of a quality team is to identify products or service that do not meet a company's specified standards of quality. If a problem is identified, the job of a quality control team or professional may involve stopping production temporarily. Depending on the particular service or product, as well as the type of problem identified, production or implementation may not cease entirely.

3.8.8 Objective of quality control:

- ❖ Research
- ❖ Selection of Raw materials
- ❖ Process Control
- ❖ Product Test
- ❖ Process Development
- ❖ Specification Test

3.8.9 Quality control System in H C K Ltd.:



On-line quality control:

There are two types of on-line quality control. There are as follows:

- ❖ Raw material control
- ❖ Process control

Raw material Control:

Raw Material control means Control the quality of raw materials such as quality of grey fabric, dyes, chemicals and auxiliary.

Process Control:

Process control means the selection of right process and controlling of some parameters, Such as PH, Water volume, Temperature, Reel speed, Pump pressure Etc.

On-line tests:

- ❖ Dyed fabric
- ❖ Shade Check
- ❖ Wash fastness
- ❖ Water fastness

Off-line Test

Off- line tests for finished fabrics are divided into two groups. there are follwys:

- ❖ Physical Test
- ❖ Chemical Test

Physical Test:

- ❖ Dimensional stability
- ❖ Spirality Test
- ❖ GSM test of fabric
- ❖ Abrasion resistance Test
- ❖ Color Fastness of rubbing Test

3.9 List of Equipment:

The list of equipment's to Quality Assurance:

- ❖ Inspection machine.
- ❖ Electronic balance
- ❖ GSM cutter.
- ❖ Measuring tape.
- ❖ Scissors.
- ❖ Indication sticker

Picture:



Figure: Inspection Machine

MAINTENANCE & UTILITIES SECTION

3.9.1 Maintenance & Utility:

3.9.2 Objective of maintenance:

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

3.9.3 Types of maintenance in H C K Ltd.:

- ❖ **Preventive Maintenance:** Preventive maintenance is a predetermined routine activity to ensure on time inspection or checking of facilities to uncover conditions that many lead to production break downs or harmful description
- ❖ **Break down maintenance:** In this case, repairs are made after the equipment is out of order and it cannot perform it normal function.
- ❖ **Routine Maintenance:** Maintenance of different machines are prepared by expert engineer of maintenance department. Normally in case of dyeing machine maintenance after 30 days complete checking of different important parts is done.

3.9.4 Utility:

Here the following utility services are available:

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

Water:

Water Pumps:

SL. No.	Centrifugal Pump for water supply to dyeing & Other Section		Capacity
01	20 H.P Pedrollo Pump each pump, 1000 l/min	4 Unit	4000.00 l/min
02	10 H.P Pedrollo Pump flow rate, 600 l/min	1 Unit	600.00 l/min
03	5.5 H.P Pedrollo Pump flow rate, 50 l/min	1 Unit	350.00 l/min
04	Spare pump motor Pedrollo 20 H. P 1 Unit and 5.5 H. P	1 Unit	100 l/min
05	Jhonson Pump 30 H. P	2 Unit	100 l/min
06	KSB Pump 30 H. P	1 Unit	100 l/min
07	Submersible Pump KSB	46 KW	150 m ³ /hr

Steam:

SL. No.	Brand name of boiler	Origin	No of machine	Capacity
01	Standard Kessel	Germany	01	12 Ton
02	Cleaver Brooks	USA	01	03 Ton
03	Cleaver Books	USA	01	10 Ton/hr
04	Hurst	USA	01	470 Kg/hr

Electricity:

SL. No.	Machine description	Origin	No. of Machine	Capacity
01	Caterpillar Gas Generator	USA	01	1154 KW
02	Warsila Gas Generator	France	01	952 KW
03	Prime Power Generate	Spain	01	636 KW
04	Substation power Development board (PDB)	Bangladesh	01	1000 KW

Boiler:

Brand Name	Singapore
Model	EGS 630-3
SL. No.	30112
Stand by voltage	440 KW. 550 KVA
Max Pressure	200 PSL

Picture:

Figure: Boiler

Gas:

PPC natural gas from titas gas transmission company. Gas is used as the fuel of boiler, Generator and also used for heating dryer, Stenter and compactor machine Etc.

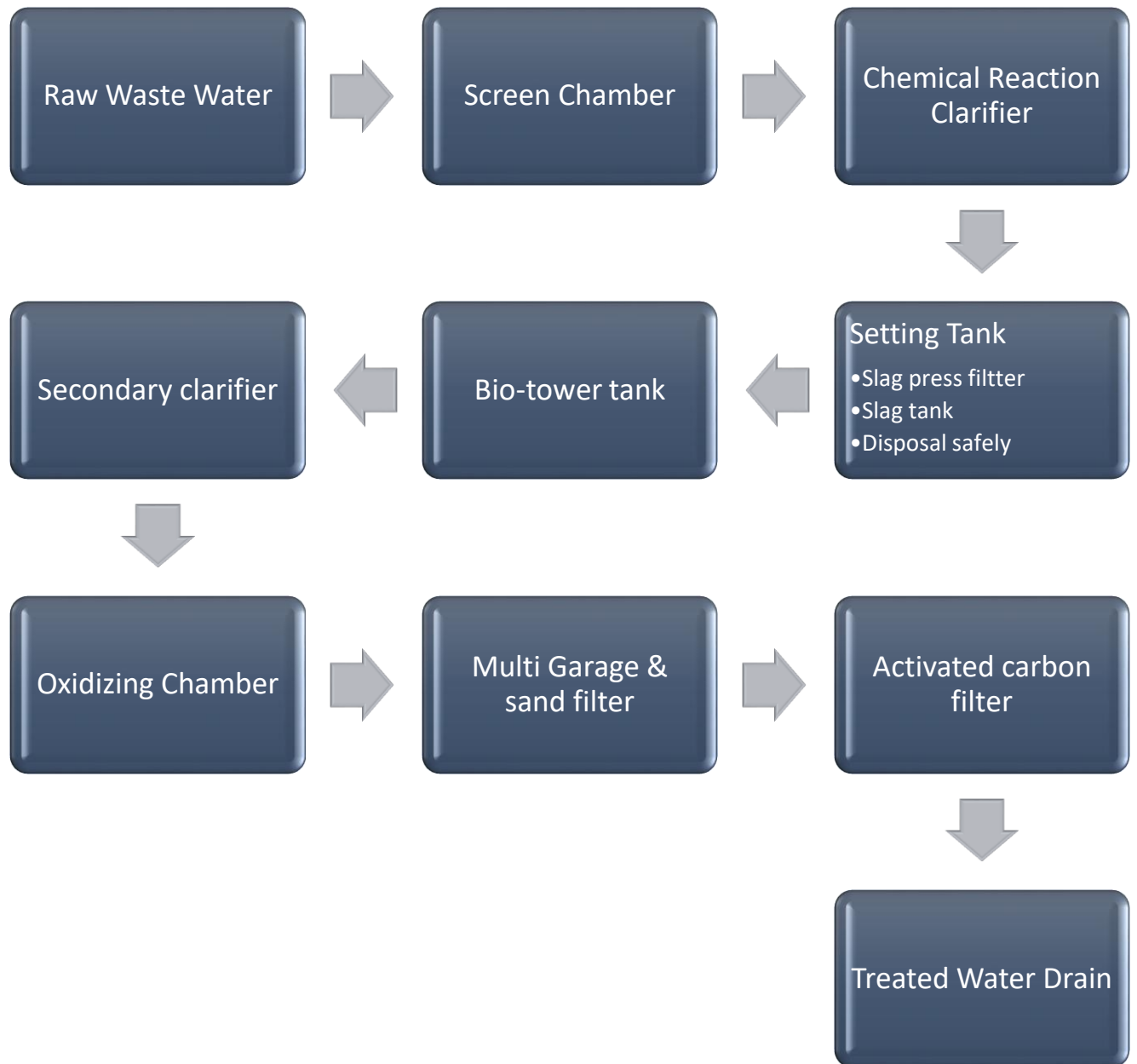


Figure: Gas Generator

3.9.5 Effluent Treatment Plant (ETP):

The effluent which is treated by a plant that is called effluent treatment plant. In fact, water is the heart for dyeing industry & chemical also an important for different stage of dyeing. Now it is quite impossible without chemical continue dyeing. So which chemical we use in dyeing that mixed with water and finally drains. If the chemical mixed water goes outside through river it is very harmful for not only our environment but also all alive animals.

3.9.6 Process Sequence of ETP:



3.9.7 Photo Gallery of E T P:



CHAPTER- 04

IMPACT OF INTERNSHIP

4.1 Impact of Internship:

As a part of course curriculum of Daffodil international university, students are sent for industrial attachment for two months in related field. During the attachment students worked as a trainee textile engineer and had to attend the official working days in general working times.

4.2 Knitting section:

- ❖ Here we enhance our University learning experience of knitting through involvement in practical field, thus enabling me to relate theoretical concepts with practical situations.
- ❖ In knitting department, we learn many things. Like the floor layout, machine specification, Organ gram of knitting department, yarn count, fabric type, machine type, production capacity, production calculation, count wise GSM, CAM arrangement, derivative of single & double jersey, grey fabric inspection process, types of knitting machine, the total procedure of knitting etc.
- ❖ Here, we first introduce with industrial manner. Like how the staff communicate with each other, higher management & the worker.
- ❖ It appreciated us the relevance of my academic work and now we can apply this to new situations.
- ❖ And now we are fully confident that all of these knowledge that we have gained from knitting sector obviously influence my future carrier to make me an efficient engineer.

4.3 Dyeing section:

- ❖ In dyeing department, we learn many things. Like the floor layout, machine specification, Organ gram of dyeing department, Dyes, pigment, machine type, production capacity, how to shade matching, stock solution calculation, how to control P^H , how to remove hardness, and batch card reading.
- ❖ Here, we first introduce with industrial manner. Like how the staff communicate with each other, higher management & the worker.
- ❖ It appreciated us the relevance of my academic work and now we can apply this to new situations.
- ❖ And now we are fully confident that all of these knowledge that we have gained from Dyeing section obviously influence my future carrier to make me an efficient engineer.

CHAPTER-05

CONCLUSION

5.1 Conclusion:

We have completed our Industrial Training successfully by the grace of Allah.

Industrial Attachment sends us to the expected destiny of practical life. **Hypoid Composite Knit Limited** is one of the best factories in the textile field of Bangladesh. The completion of the 45 days' industrial attachment at **Hypoid Composite Knit Limited** gave us the inspiration that factory is one of the appropriate destiny to implement the theoretical knowledge. From this industrial attachment we got the details idea about the factory environment, production process, total management, store & inventory process, maintenance, utility etc.

Hypoid Composite Knit Limited is well equipped and the working environment is excellent. The relation between top management to bottom level is so nice. We are lucky to get the opportunity of having training in this mill. The factory runs by a number of efficient Textile Engineers, Skilled technical & Non-technical persons.

All the Textile Engineers, technical & Non-technical persons are very sincere, cooperative and helpful. We wish good luck of them and also for this factory.