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Sonargaon University (SU)
সোনারগাঁও ইউনিভার্সিটি (এসইউ)

WE WILL
RISE UP
WE WILL
SHINE



Faculty of Engineering
Department of Textile Engineering

REPORT ON
Industrial Attachment
At

Liberty Knitwear Ltd
(Micro Fiber Group)

Chandra, Pallibiddyut, Kaliakoir, Gazipur

Course Title: Industrial Attachment

Course Code: Tex-442

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

Submitted By

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Supervised by:

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Lecturer, & Co-Ordinator
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Department of Textile Engineering

DECLARATION

We sincerely declare that:

This Industrial Attachment has been done by us , we also declare that neither this Industrial Attachment nor any part of this Industrial Attachment has been submitted elsewhere for award of any degree or diploma.

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Md. Monir Hossain
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LETTER OF APPROVAL

This is to certify that Md. Monir Hossain, ID:Tex.1703012114, Md. Suruj Ali , ID:Tex- 1703012134, Md. Rayen Ush Sayem , ID:Tex-1801013139, Md. Saiful Islam Saif, ID:Tex- 1801013018, BSc in Textile Engineering program, have successfully completed their Industrial Internship on Wet Processing Technology under my supervision. I do hereby approve their report. I also recommend accepting their report for partial fulfillment of Bachelor of Science in Textile Engineering (BSCTE) Degree.

.....

Kamrul Hassan Bhuiyan

Coordinator & Lecturer

Department of Textile Engineering

Sonargaon University (SU), Dhaka

DEDICATION

At first we want to dedicate this Industrial Training report to almighty Allah for giving me a better opportunity to prove ourselves. Without his help nothing is possible. I also dedicate this report to Kamrul Hassan Bhuiyan, Lecturer & Co-ordinator (Department of Textile Engineering) of Sonargaon University who helps me to complete this report. And my parents who give me chance to study in Textile Engineering and support me all time. Specially dedicate this report to **Mr. Debashish** (General Manager, Admin & Human Resource Department) of Liberty Knitwear Ltd. And all the people who have helped me in the Liberty Knitwear Ltd.. To complete this report.

ABSTRACT

For any technical education, practical experience is almost equal important in association with the theoretical knowledge. By means of practical knowledge it's not possible to apply the theoretical knowledge in the practical field.

Industrial attachment is the first step to professional life of student, especially of technical side. It's an indispensable part of study a practically running processing technology of an industrial unit for a student. University education provides us vast theoretical knowledge as well as more practical attachment, in despite of all these industrial attachment helps us to be familiar with technical support of modern machinery and skills about various processing stages.

This internship provides me sufficient practical knowledge about production management, efficiency, industrial management, Dyeing , Finishing,WTP, ETP,Quality Assurance, Garments Section , inventory control, utility and maintenance of machineries and their operation techniques etc. which cannot be achieved successfully by means of theoretical knowledge only.

All the activities of this factory are performed according to the central orders of the company. This company works for Academy buyer and sometimes works for Pritha which is an own buying house of this group of company.

During my internship we got the opportunity to study on some orders, from order receive to the delivery of the order. With the help of my supervisor we have acquired the knowledge of handling an order, the production procedure and the inspection procedure to maintain the quality of these orders. We have also learnt about the office management of this factory.

ACKNOWLEDGEMENT

At first, I like to express my gratitude to almighty ALLAH for his blessing that help me to complete this report.

I are very much grateful to our Internship Supervisor, Kamrul Hassan Bhuiyan Lecturer, Department of Textile Engineering, under whose supervision I completed my internship for his enthusiastic guidance and consideration during the entire phase of the study which made it possible for me to prepare this report.

We are highly indebted to **Mr. Debashish** (General Manager, Admin & Human Resource Department) to give permission for involvement at Liberty Knitwear Ltd. I am grateful for his all-out assistance in making our effort a successful and meaningful one. We are thankful to the authority of Liberty Knitwear Ltd who had kindly permitted me to have free access to their managerial people in good faith.

I would like to give my special thanks to honorable **Mr. Shahin Aarafat Joy** (Assistant General Manager) & **Mr. Chan Mahmud** (Manager) who in spite of his busy schedule lent me his valuable time by providing information and guidance during my internship period.

My thanks are extended to the many contributors of this report, especially the various officials of whose names we could not mention but who had made my internship worthwhile. I must mention that the excellent working environment and the positive group behavior of this organization helped us tremendously to observe the daily activities of various departments, work with the officials and stay for three long months without any hesitation. This report would carry no value without their active support.

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Chapter - 01

Introduction

** Preface

Internship report is a scope for acquiring substantial knowledge after preparing of academic classes. In order to acquire perfect education, a student must have practical knowledge along with syllabus-oriented education. Practical education is the part of the curriculum of the Business education. So before joining the substantial field, we need to acquire knowledge about the real environment. The authority of Sonagaon University provides an opportunity of preparing Internship report, which is a part & parcel of B. Sc. in Textile Engineering curriculum. The course designed with excellent combination of theoretical & practical aspects to provide an opportunity to the student on the job exposure.

Like every year, as a student I got the opportunity to accomplish internship report on "**Production performance of Liberty Knitwear Ltd.**". After the acquisition of both academic that is theoretical education as well as practical education, we must have to know the process of applying this knowledge in the complex situation of practical life

At the time of preparing the Internship report, I tried my best to make the Internship report meaningful. Yet there may be few errors in this Internship report, I am whole heartedly sorry for all of unintentional mistakes & your fair glance is highly expected about the matter.

** Objectives

The main objective of this study is to gather practical knowledge regarding production performance and overall activities of Liberty Knitwear Ltd. In addition to the main objective, the following are some of the common but significant objectives of this type of study.

To acquire knowledge about production process of Pacific Jeans Ltd.

- To measure productivity of the company.
- To know about production process of Liberty Knitwear Ltd.
- To know the interaction between production and marketing and other functional departments in the organization and also with various interest groups including the customers, suppliers, middle men and financial bodies.
- To know about marketing workflow of Liberty Knitwear Ltd.
- To know about way to attract and retain buyer.

****Methodology**

The purpose of the internship report is to gather practical knowledge in the field of production and marketing activities of Liberty Knitwear Ltd. An information plan was developed to conduct this study. This Internship report has been prepared on the basis of both primary and secondary data. To collect the primary data the following steps have been followed to obtain the objectives:

- Conversation with managers and related employees. and visited all the floors and departments of the Pacific Jeans Ltd.

To collect secondary I have to depend on various sources. Thus secondary data that used in internship report was taken from:

- Company's Annual Report.
- Employment policy.
- Research Articles.
- Related Textbooks. And websites and others.

**** Limitations**

The study has been conducted subject to certain constraints:

- The internal and sensitive information was not found properly from the organization. Lack of sufficient accessible books and journals about Garments industry.
- Unavailability of enough relevant records and information.
- Published information is not up to date.
- Employees are not allowed to provide in depth information about their practices as the information is confidential.
- The rate of success of my study may be limited as I might have failed to collect proper information due to lack of my experience.

Chapter - 02



Fig.: 2.1 – Liberty Knitwear Ltd

Liberty knitwear Ltd.

(100% Export oriented Dying, Finishing, knitting, & Garments)

Location:-Chandra, Pallibiddyut, Kaliakoir, Gazipur

Bangladesh

Phone:-02-77885528

E-mail:info@mfgbd.net

Head Office

T.K. Bhaban ,(6 & 10th Floor)

13 Karwan Bazar, DHAKA 1215

Phone:-02-550135572, 550135573

1.3 Factory: Description

Liberty knit wears ltd is one integrated knit garments manufacturing in Bangladesh. It has the follow machinery the which modern Technology for the production. In PRI has medium production capacity capacity. And t is in a less production due to insuff day shift. Liberty knit wears ltd with assuring the required quality fo Buyers. It is present producing the USA, the Canada and Bangladesh. It has a very good quality control department. The British Standard (BS) and American St

Liberty knitwears ltd worker maintain Human Resources and Development (HRD) section. They follow the modern metho different department and the qualifie In this report, we have mationtried about to prod Liberty knitwears ltd. We have produce high quality knitted fabrics for the different types of buyers.

1.12 Mission & Vision:

Mission :

Liberty knitwears ltd mission is to create the conditions and infrastructure for the supply and production of sustainable textile products.

Liberty knitwears ltd making high quality to withstand high competitiveness.

Design, manufacture and sale of high quality and affordable clothing and accessories.

To use the latest technologies in the manufacturing process. To provide a safe working environment for employees.

To operate the business with great motivation and dedication. Erving and support the society in which we work.

Vision :

Liberty knitwears ltd is a leading up growing sustainable textile company producing high quality products and the largest observation of social, economic and environmental standards. Its objective is to provide high quality products and fast service to our customers. Pacific Fibre Corporation Ltd goal is to create a good price through a competitive atmosphere, fine systems and processes.

LKL vision is threefold:

1. Launch the textile industry in Bangladesh
2. Economic and Environmental Respect the highest social standards 3.Maintain customers engaged

and stisfied

**An Overview of Liberty Knitwear Ltd.

Liberty Knitwear Ltd. is a world class casual wear manufacturing company known for its state of art world class facility, extensive and unique research and development centre and high skill human recourses which have transformed a small garments factory established in 1984. At present Liberty Knitwear Ltd. is a leading premium garments manufacturer, 25000 people producing over 30 million garments over Fig:-2.3 Liberty Knitwear Ltd.

Every year and exporting to over 25 countries. . It has started commercial production in 1994. With continuous focus on quality improvement and value addition, adoption of top of the line technology, commitment toward safe and healthy workplace for workers and strict adherence to customer compliance requirements, this group become one of the most preferred suppliers of leading global fashion retailers.



Mr. Shamsuzzaman is the managing director of the company. He is a well experienced business personnel and industrialist in Bangladesh. He has the vast marketing experience and for exploring the export business he had the opportunity to travel all over the world and established a good business relationship with the overseas buyers. Liberty Knitwear Ltd. has created their position and image through excellent quality maintaining. Within a very short time of span the company achieved some significance success. Microfiber group has achieved GAP and BSCI certificates. To maintain world-class quality garments Pacific Jeans concentrates on the following factors.

- ▶ Quality of the input (such as fabrics, accessories, chemicals etc.)
- ▶ Quality of sewing.
- ▶ Quality of sewing thread.
- ▶ Quality of washing.
- ▶ Quality of packing.
- ▶ Quality of Finishing.

2.1 Concerning Organizations of Liberty Knitwear Ltd.



**Goals

The strategic Goals and Objectives of the Company are to strive hard labor and sincere efforts to provide quality and value added products to their esteemed clients obeying the national and international code of conduct and to create more competitive in the internal and external market.

**Objectives

- To ensure 100% security.
- To ensure 100% delivery in just time.
- To ensure 100% product quality at first time.
- To maintain 100% commitment.
- To ensure 100% utilization of wealth and resources.
- To ensure 100% transference.
- To ensure 100% honesty, discipline, and sincerity.

**Principles

- All the employees, customers/consumers and suppliers are behaved with morality.
- All types of corruption must be prevented when and where it is occurred.
- To recognize the contribution of all workers and help others to contribute.

- To ensure the equal facility for all workers and to avoid all types of partiality.
- Always ensure the maximum utility of wealth and resources.
- To ensure the health care of employees and provide the safe work environment.

**** Policies and Procedures**

- Maintain cordial relations with all stakeholders, namely- customers or buyers, suppliers and employees
- Fight against dishonesty, fraud and corruption as and when it occurs.
- Recognize the contribution of each individual and assist others to make meaningful contribution.
- Equal rights for all and no discrimination in any field,
- Always ensure maximum utilization of resources,
- Ensure health and safety of workers and encourage an environment conducive for work.

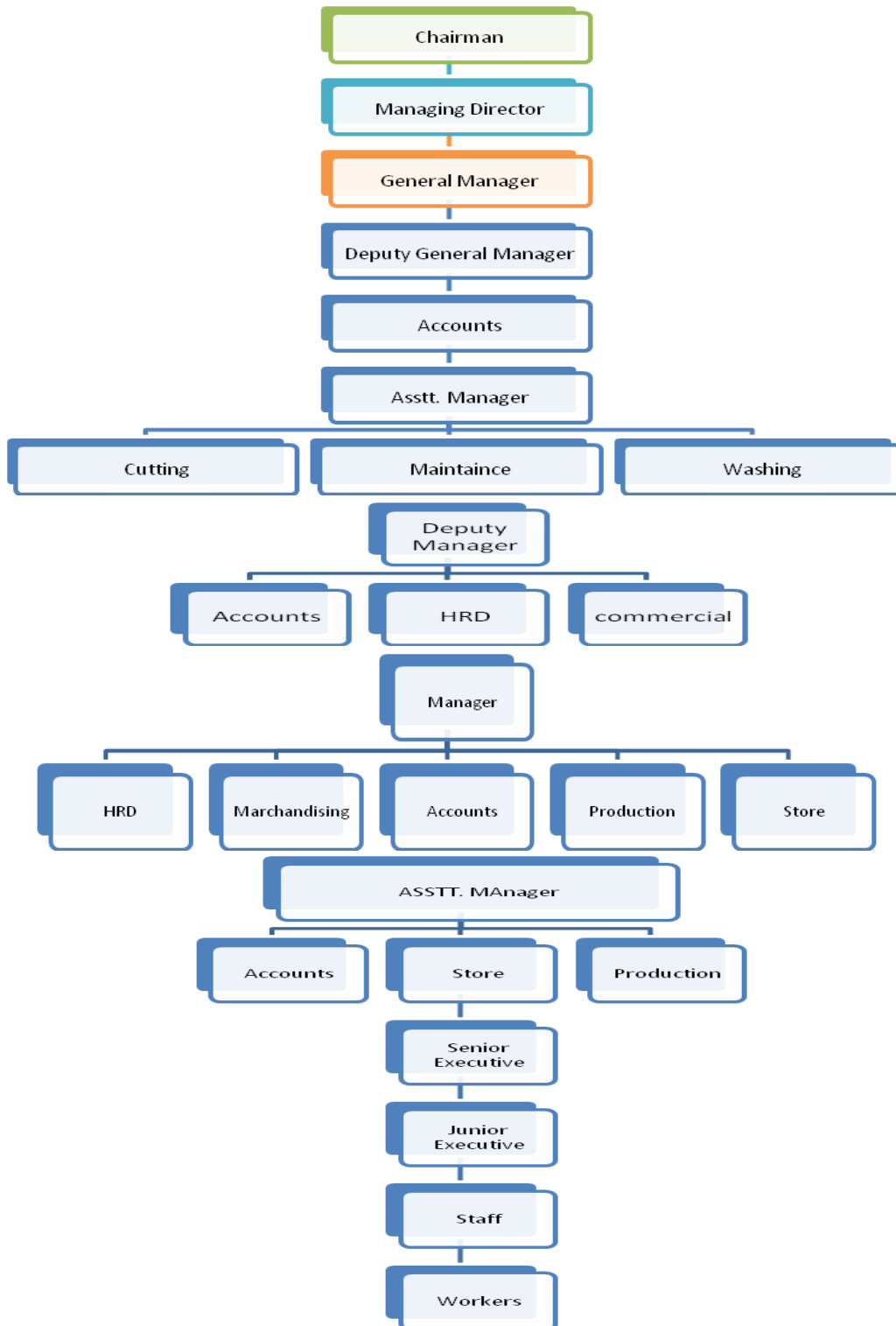
The vision of the company, which is also its motto- “RESPECT FOR INDIVIDUAL”, has been set up at the very entrance of the building. Boards bearing these words are placed on the walls of each floor. The officials informed us that all the employees right from the top-level to the junior most position is treated with respect and dignity for his/her work.

**** Code of Conduct of Liberty Knitwear Ltd.**

- Liberty Knitwear Ltd. abides by the principles that decisions on hiring, salary, benefits, advancement, termination or retirement are based solely on the availability of and individual to do the jobs.
- Forced labor: Liberty Knitwear Ltd does not use force labour in any form from Prison, indentured, bonded or otherwise.
- Child labor Liberty Knitwear Ltd.. does not employ any person below the age 18.
- Compensation: Liberty Knitwear Ltd. Provides each employee at least minimum wage or higher and provided each employee a clear, written accounting for every pay period.

- **Benefits:** Liberty Knitwear Ltd. provides each employee all legally mandated benefits. These include meal subsidies, transportation or transportation subsidies. Others cash allowances, health care, pregnancy or sick leave, vacation, religious holiday, leave and contributions for provident fund.
- **Hours or Work/overtime:** Liberty Knitwear Ltd. complies with legally mandated work hour's uses overtime only when each employee fully compensated according to local law and on a regularly scheduled basis provides one day off in seven and requires no more than 60 hours of work per week.
- **Management of Environment, Safety and Health:** Liberty Knitwear Ltd has written health safety guidelines, has a factory safety committee provides personal protective equipment free of charge and mandates its use and complies with all applicable local environmental, safety & health regulations.
- **Every employee shall be treated with respect and dignity.** No employee shall be subject to any physical, sexual, psychosocial or verbal harassments or abuse. Written disciplinary procedures shall be applied fairly among all workers.

****Organizational Structure:**



**** Products of Liberty Knitwear Ltd.**

Liberty Knitwear Ltd. Manufactured Various Types of Garments

- ↘ T-
↘ Shirt
- Hoodie Jacket
- ↘ Three Quarter Length
↘ Trousers
- ↘ Jacket Joggers
- ↘ Kids Pant
- ↘ Ladies
- ↘ Overall

****Buyers of the Liberty Knitwear Ltd.**

Liberty Knitwear Ltd. is working with leading fashion retailers from US, UK and Japan. They have also started exporting to central / South America and Turkey. They are exporting new market to expand diversify our customer base. They are expanding their export base to Asian markets like China, Hong Kong, South Korea, Taiwan, Malaysia, Singapore, Thailand, and India.

*** Kiabi**

*** LPP**

*** Jennyfer**

*** Kariban**

*** Marubeni**

*** Lidl**

*** NKD**

COUNTRY	NAME OF THE COMPANY	PERCENTAGE
1) France	Kariban	36.00%
2) Europe	Kiabi	36.00%
3) Honkong	Lidl	21.11%
4) Germany	NKD	15.07%
5) Others	LPP, Jennyfer & Others	2.82%

Chapter - 03

Compliance

**Compliance Issue:

Compliance means comply something i.e. yield to the wishes another. The main aim of compliance is to ensuring the all labor rights and facilities according to buyer code of conduct.

** Different compliance issues which they are obeyed:

<u>Admin & HR dept.:</u>		Health & hygiene:
❖ policies:	Personnel	✓ First aid ensures.
✓ policy	Recruitment	✓ Medicine registers.
✓ policy	Leave and holiday	✓ Maternity and pregnancy register.
		✓ Pure drinking water
❖ leave register card:	Attendance and	Safety:
✓ Their weekly working hour not more than 66 hours including overtime in a week.		✓ Safety committee
✓ They have the approved manpower list.		✓ Fire-fighting committee
		✓ Rescue committee
		✓ Broken needle register
		✓ Needle detector
		✓ Fire alarm & switch
		✓ Evacuation plan
		✓ Rubber mats to every iron man.
		Welfare:
		✓ Welfare committee
		✓ Day care center
		✓ Canteen facility

Chapter - 04

Dyeing Lab Department



**** Lab Dip Development:**

Lab Dip Development means the sample which is dyed according to buyers requirements (similar shade and so on). Sample dyeing and bulk production dyeing depending on lab dip development.

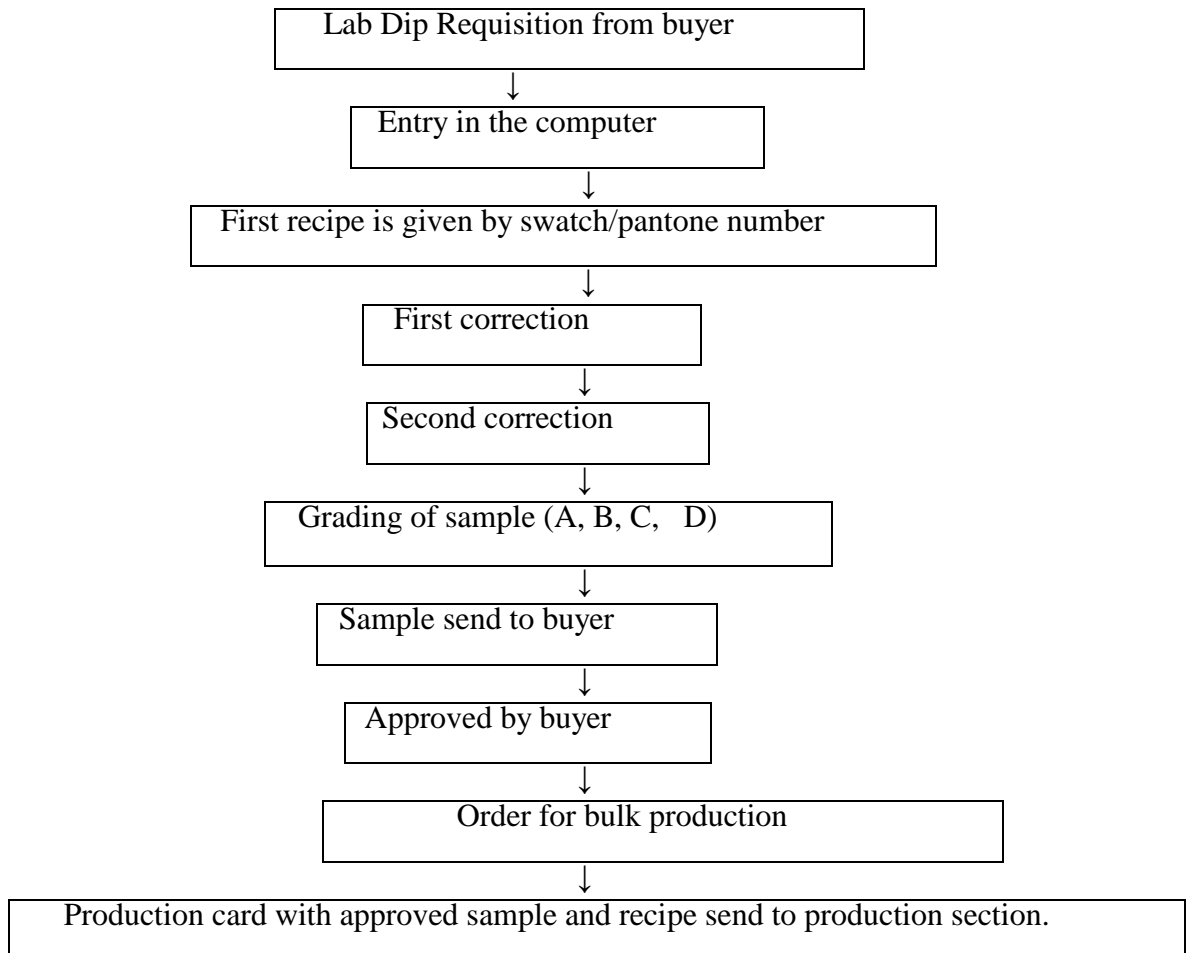
**** Object of Lab Dip:**

The main objectives in lab dip are as follows:

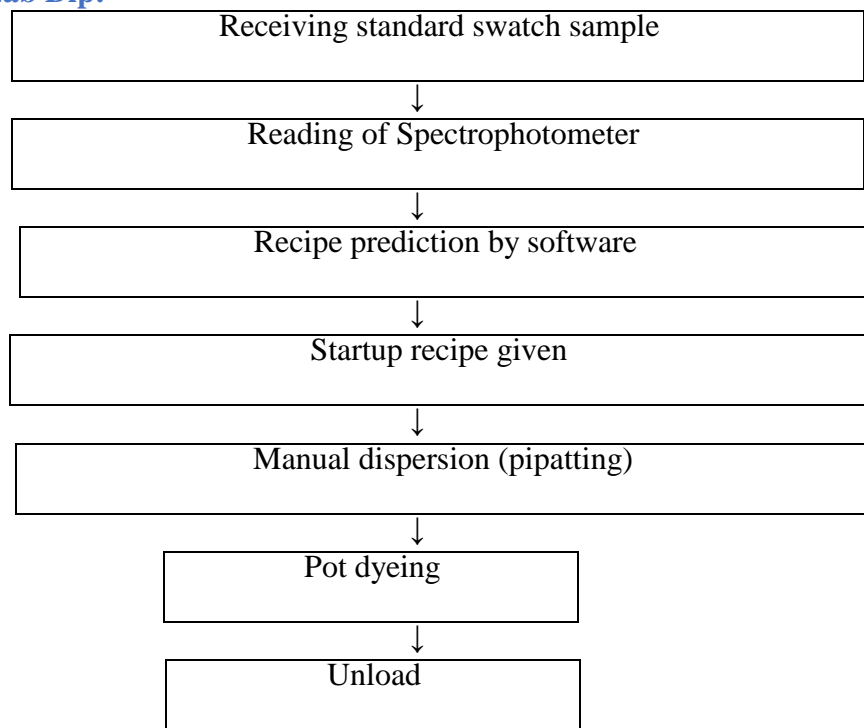
- ✓ To calculate the recipe for sample dyeing.
- ✓ To calculate revise recipe for sample dyeing.
- ✓ To compare dyed sample with swatch by light Box or Spectrophotometer.
- ✓ Finally approved Lab Dip (Grade: A, B, C & D)

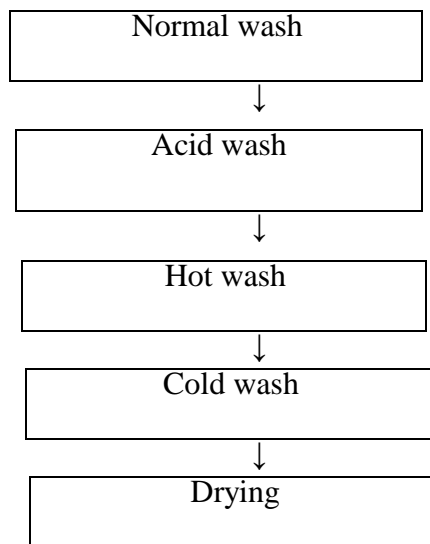
****Process Sequence of Lab work :**

Lab work plays an important role in bulk dyeing process. Bulk dyeing process completely depends on the lab dip development work.



**** Development of Lab Dip:**





****How to Make Stock Solution:**

0.001% → It means in 90 cc water mixed 10 cc chemicals.

0.01% → It means in 99 cc water mixed 1 cc chemicals

0.1% dye shade → It means mix 0.1 gm dye in 100 cc water

0.5% dye shade → It means Mix 0.5 gm dye in 100 cc water.

1% → Mix 1 gm dye in 100 cc water.

2% → Mix 2 gm dye in 100 cc water.

**** Calculation Stock Solution in Lab Dip:**

$$\text{Dyeing (Solid)} = (\text{Sample Weight} \times \text{Shade\%}) / \text{Stock\%}$$

$$\text{Chemical} = (\text{Chemical Weight} \times \text{Total liquor}) / \text{Stock\%} =$$

$$(\text{Chemical wt} \times \text{Total liquor} \times 100) / (1000 \times \text{Stock\%})$$

****Calculation Used in dyeing Lab:**

$$\text{Chemical} = (\text{Sample wt} \times \text{ML:R} \times \text{Shade\%} \times 100) / (1000 \times \text{Stock\%})$$

***** - Laboratory machines:**

Serial No.	Machines
01	Crock meter
02	Wash fastness tester
03	Perspiration fastness tester
04	Spectrophotometer
05	Tumble dryer
06	Sample dyeing machine

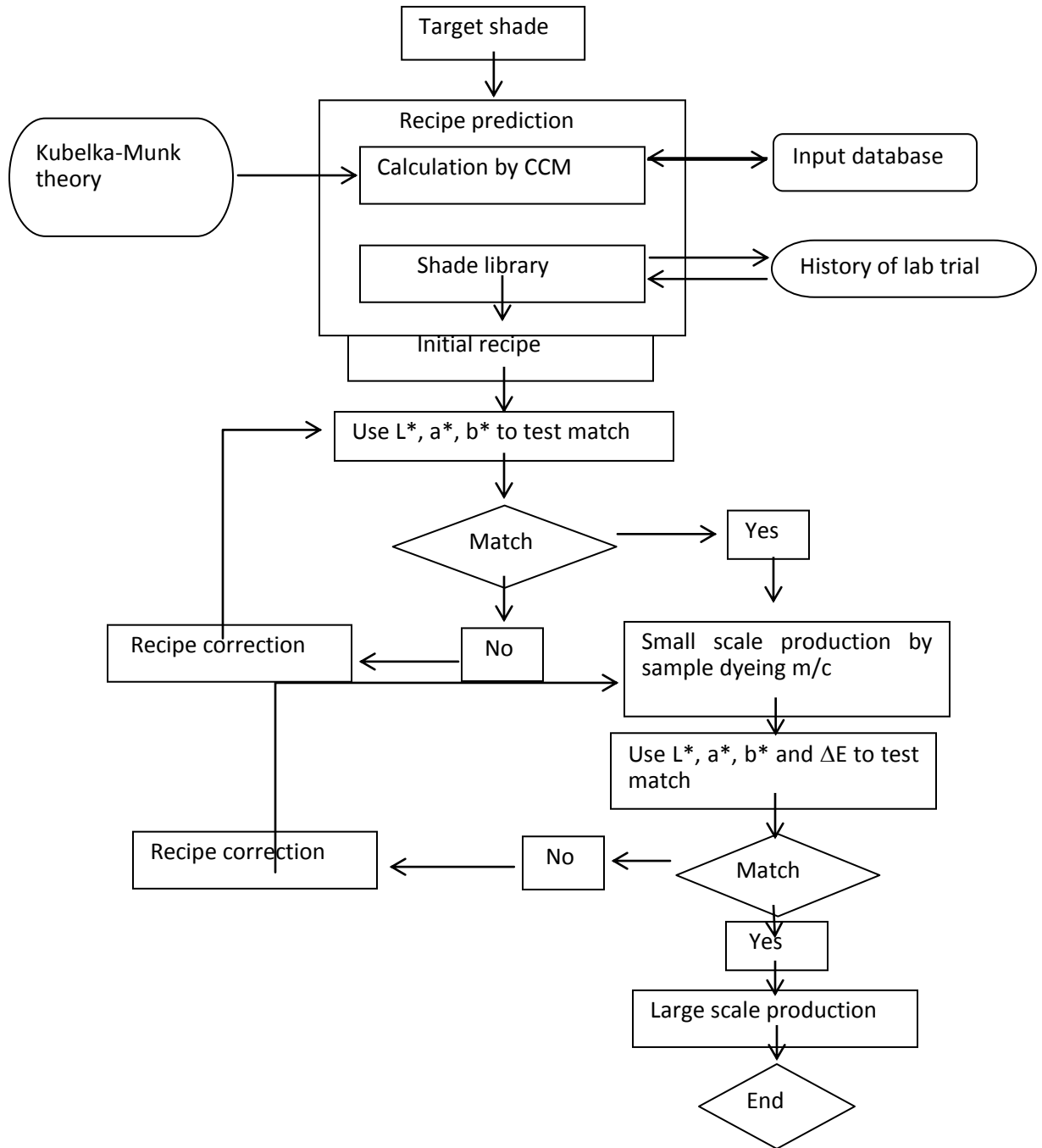
**** Computer Color Matching System (CCMS):**

Computer color matching system (CCMS) is the latest system to predict and analyzed the color of the sample. In wet processing section it is mostly used. In 1963 it is first introduced by ICI Company but it is introduced international color system in 1973. Now different companies produce CCMS but among them DATA COLOR is the best.

**** Different Components of CCMS**

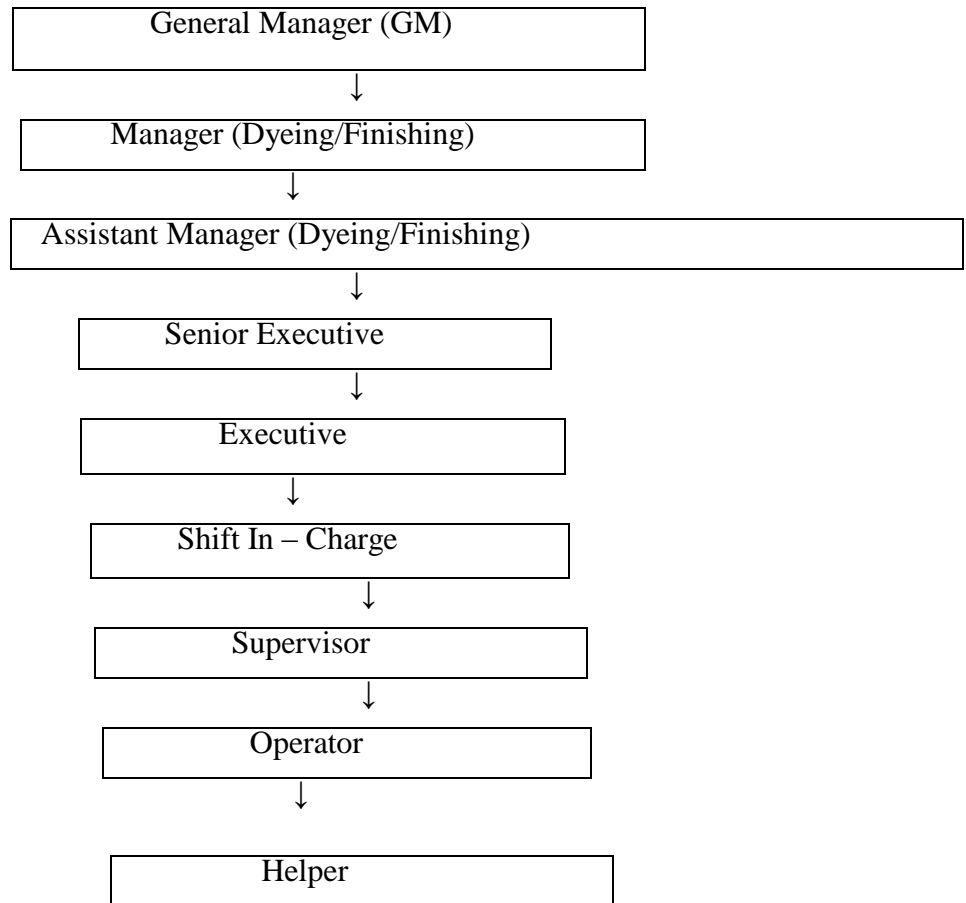
- A. Computer
- B. Spectrophotometer
- C. Printer

****Spectrophotometer flow Chart:**



Chapter - 05

*** ORGANOGRAM OF DYEING SECTION



**-RESPONSIBILITIES OF PRODUCTION MANAGER:

To identify any kind of dyeing problems during dyeing.

To observe whole dyeing procedure.

To supervise senior and junior production officer.

To provide production schedule and capacity.

** RESPONSIBILITIES OF EXECUTIVE

To provide dyeing recipe.

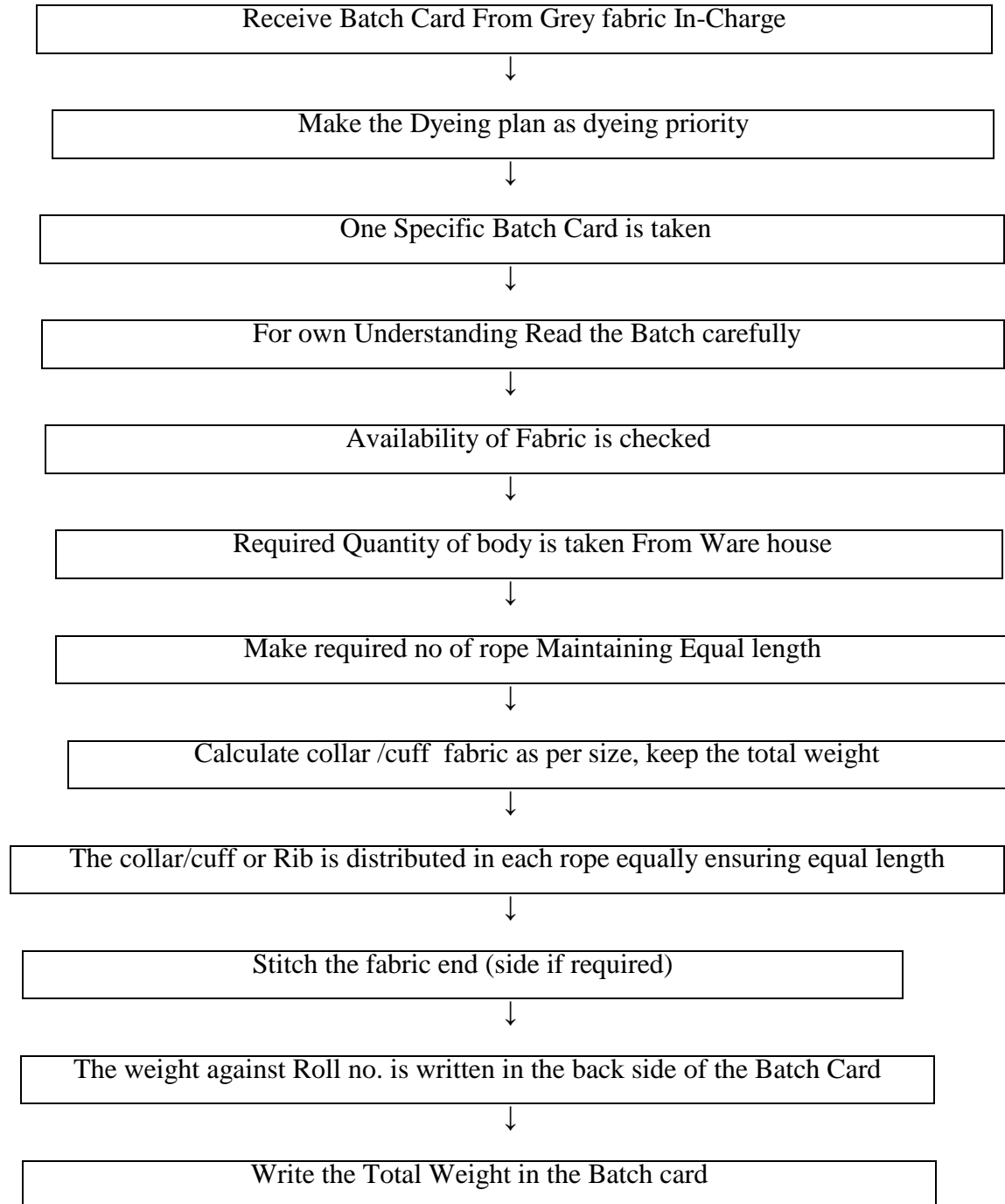
To check and maintain PH during dyeing.

To supervise assistant, operator, helpers.

To check water level & every dyeing batch.

To check daily production & report to the production manager.

** PROCESS SEQUENCE OF BATCH PREPARATION



Chapter - 06

** BATCH MANAGEMENT:

Primarily batching (same characteristics material) is done by dyeing manager taking the above criteria under consideration. Batch section in-charge receives this primary batch plan from dyeing manager. Sometime planning is adjusted according to machine condition or emergency delivery.



** OBJECTIVES OF BATCHING:

- To receive the grey fabric roll from knitting section or other source.
- Turn the grey fabric if require.
- To separate different types of fabrics
- To put the same characteristics fabric jointly.
- To ensure proper dyeing with actual shade.

** TO PREPARE THE BATCH OF FABRIC FOR DYEING ACCORDING TO THE FOLLOWING CRITERIA

- Received order sheet from buyer
- Dyeing shade prediction (color or white, light or dark)
- Machine capacity
- Machine 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.
- To use maximum capacity of existing dyeing machine
- To minimize the washing time or preparation time & machine stoppage time.
- To keep the no. of batch as less as possible for same shade.
- To use a particular machine for dyeing same shade.

**** FABRIC TURNING M/C:**

Model	DNAT- 400
Roller Width	400 mm
Machine Space (over all)	Length =5.6m Width =1.1m Height = 1.41m
Set-up	Length =7.6m Width =2.1m Height =1.51m
Production Capacity	7~10 Ton/Day
Spare parts (Tool Box)	1 set
Electric Capacity	11.75 kw
Fan Motor	11 kw
Roller Motor	0.75 kw

Chapter - 07

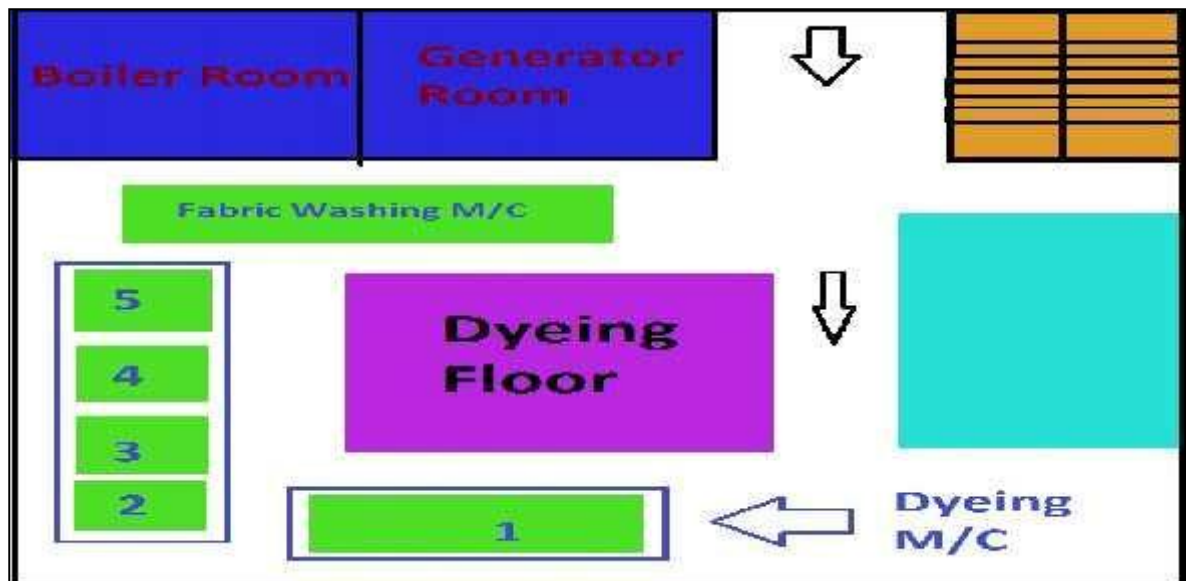
Dyeing: floor

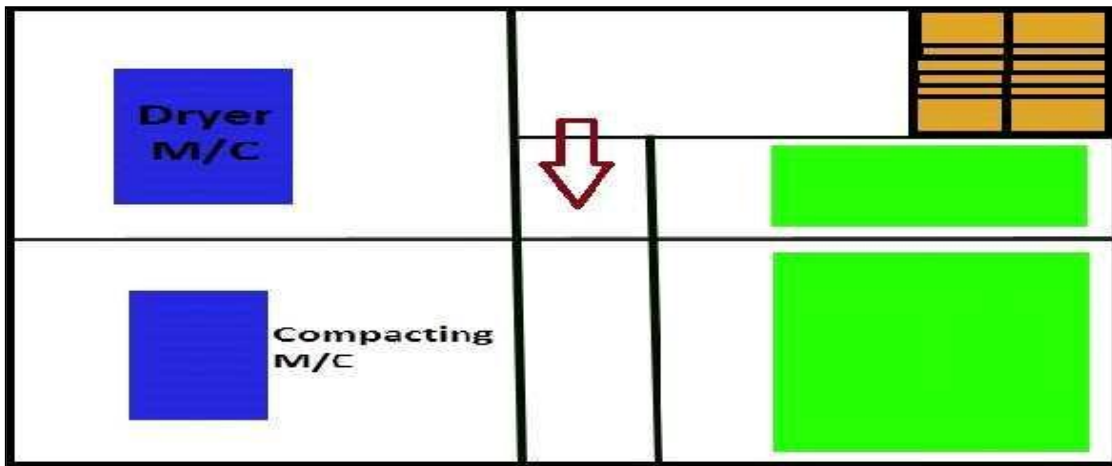


The dyeing section is a modern dyeing section equipped with highly productive world class dyeing machines such as AKM Dyeing m/c. In dyeing section there are 25 sample dyeing m/c & 22 bulk dyeing m/c.

2.1 Layout plan of Dyeing section:

Ground Floor





**** Chemical Used in Dyeing Section:**

Sl. No.	Application	Name of the chemical
1	Desizing agent	Iglasize HW-CFD
2	Detergent	Ferol IPC
3	Leveling agent	Piliver IRSO
4	Anticreasing agent	Cross Color NLD
5	Wetting agent	Antiform Soko SIT Cross color ORG
6	Binder	
7	Sequestering agent	Gilmax 90 A
8	Glauber's salt	Na ₂ SO ₄
9	Soda ash	Na ₂ CO ₃
10	Caustic soda	NaOH
11	Acetic acid	CH ₃ COOH
12	Soaping agent	Zetasal SR Extra
13	Cold enzyme	Iglazyme Deplimax Neutral PJL
14	Non ionic softener	Comfort PEN B-10
15	Anionic softener	Soft Sili Clearsil MAC 90 New Sile

16	Chelating agent	Neocrystal 150 Neocrystal 200
17	Cationic fixing agent	Yukenfix S-25
18	Reactive dye	Ciba. Red Ciba. Yellow Ciba. Brown
19	Direct dye	Sol. Brown Sol. Yellow Sol. Grey Sol. Bordeaux
20	Pigment dye	Ema Yellow Ema Blue Ema Red
21	Asutex dye	Asudel Bordeaux RL Asudel. Olive

**** PRODUCTION PARAMETER:**

Process names	pH	Temperature	Time
Scouring & bleaching	10	100°C	1 hrs
Levelling	4-4.5
Enzyme wash	4.5-5	55°C	30 min.
Reactive Dyeing (M:L=1:8)	10-12	60°C	1 hrs
Polyester Dyeing (M:L=1:10)	5-6	135°C	45 min.

*****Raw Materials of Dyeing:**

Fabrics:

1. Single jersey grey fabric
2. Rib fabric
3. Interlock fabric

** Dyeing Recipe for Reactive dye:

- * Detergent (PCLF) =0.8%
- * Sequestering Agent (2UD) =0.5%
- * Stabilizer (Sifa) = 0.3%
- * Soda=2.5%
- * $H^2O^2=2.5\%$
- * Acetic Acid=0.5%
- * Enzyme=0.3%
- * Leveling Agent=1.5%
- * Sequestering Agent=0.5%
- * Reactive Dy
- * Yellow SPD=0.08%
- * Yellow 4GL=1.4%
- * Salt=35%
- * Soda=8%
- * Acetic Acid=0.3%
- * Softener =0.2%
- * Soaping Agent (Hog)=0.3%
- * M: L=1:10
- * Time= 6-7 hours
- * Fabric Weight: 168 kg
- * $P_H=10-11.5$

**Dyeing Procedure:

1. At first Detergent (PCLF), Sequestering Agent (2UD), Stabilizer (Sifa), Soda were added to the dyeing chamber and required amount of water is added to it at room temperature 10 minutes.
2. Fabric was added to the dyeing chamber and increase the temperature at 70 -80°C. Then, the scouring process was going on 1 hour. 3. Then, H₂O₂ was added to the bath and continue 1 hour at 70-80°C.
4. After bleaching, drain out and then washed the fabric at 80°C about 15 min. And cut out a sample to test how much the bleaching was occurred on the fabric. If it passed in the test then we should go to the next step.
5. To neutralize the fabric, added acetic acid and raise the temperature 80°C and continue it 15 min.
6. Then, drain out and supply cold water and make a cold wash about 15 min and bath drain out.
7. After scouring and bleaching the fabric, Dye, Salt, Softener, Sequestering agent and required amount of water is added to the dye bath at room temperature for 10 min.
8. Dosing the Soda with raising the temperature at 60°C. And P_H maintains 10-11.5 and continue 1 hour.
9. Drain out and make a normal wash. Then, fabric is hot washed at 80°C for 20 min.
10. Made acid wash at 80°C for 15 min to maintain the P_H range 4.5-5. 11. Drain out and Non-ionic Soap wash at 60°C about 20 min.
12. Cold wash about 20 min.

Chapter - 08

** Chemical list of Liberty Knitwears Ltd.

S.	Chemical	Dyes
01	Hydrogen Peroxide	Black LW
02	Acetic Acid	Black SDS
03	G/Salt	Red BS
04	C/Salt	Red RR
05	Soda Ash	Red HE3B
06	Caustic	Yellow 4GL
07	Softener	Yellow LW
08	Enzyme	Yellow SPD
09	Bleaching powder	Black ECOG
10	Fixing Agent	Blue HEGN
11	Anti-creasing Agent	Blue SPD

12	Detergent	Blue PR
13	Leveling Agent	Orange-25
14	Sequestering Agent	Orange ME2ri
15	Stabilizer	Turgaise GC
16	Soaping Agent	S/Black BR

Chapter - 09

** Dyeing Faults & Remedies:

1. Uneven dyeing:

** **Cause** : Uneven pretreatment. - Improper color dosing.

- Uneven heat setting just in case of artificial fibers. - Lack of management on colouring m/c.

** **Remidies** : -By making certain even pretreatment. - By correct color dosing.

By making certain even heat setting just in case of artificial fibers. - By dominant on colouring m/c.

2. Batch to batch shade variation:

** **Cause** : Improper dosing time of dyes and chemicals. - Dyes ton variation.

- Improper reel speed, pump speed, liquor magnitude relation. - Improper pretreatment.

- ** **Remidies** : Use standards dyes and chemicals.

- Maintain constant liquor magnitude relation. - Maintain constant colouring cycle.

**** Uneven dyeing effect:**

-** **Cause** : Faulty injection of alkali.

- Improper addition of color
- Attributable to hardness of water. - Improper salt dosing.
- Dye migration throughout intermediate colouring.

**** Remedies :** By making certain correct pretreatment. - Correct dosing of dyes and chemicals.

- Heat ought to be same throughout the dye and chemicals. - Correct salt dosing.

4. Roll to roll variation:

-** **Cause:** Poor migration of dyes. - Improper dyes solubility. - Faulty m/c speed.

**** Remedies :** Use normal dyes and chemicals. - Correct m/c speed.

5. Crease mark:

**** Causes:** Poor gap of the material rope. Shock cooling of artificial material.

c_ Maintaining the correct reel speed and pump speed. - Reducing the m/c load.

Dye spot:

-** **Causes:** Improper dissolving of dyes in dye bathtub.

- Improper dissolving of hydrated oxide in dye bathtub.

-** **Remedies :** By correct dissolving of dyes and chemicals.

- By passing the dissolved coloring material through a fine stainless-steel mesh filter, in order that the massive un-dissolved particles are removed.

7. Chemical Mark:

- Improper admixture of the chemical.

- Improper period of time of the material throughout application of chemical.

-** **Remedies :** Maintaining correct reel speed & pump speed. - Correct admixture of the chemical before addition.

Chapter - 10

** Quality Assurance System

** Objective of quality control:

- ✦ Research.
- ✦ Selection of raw materials.
- ✦ Process control.
- ✦ Process development.
- ✦ Product testing.
- ✦ Specification test

** Quality management system:

Off line test	On line test
<ul style="list-style-type: none">✦ Physical test✦ Chemical test	<ul style="list-style-type: none">✦ Rubbing fastness✦ Water fastness✦ Wash fastness✦ Shade check
Physical test	Chemical test
<ul style="list-style-type: none">✦ Abrasion test✦ Rubbing test✦ Dimension stability check	<ul style="list-style-type: none">✦ Colour fastness to light✦ Colour fastness to washing✦ Colour fastness to Perspiration✦ Colour fastness to heat

**** Quality standard:**

Basically Mashriquee Textile Ltd. follows ISO standard but the quality standard basically depend on the buyer choice.

**** Testing lab**

Different types of test are done on a garment according to the buyer requirement –

1. Color fastness to wash
2. Color fastness to perspiration
 - a. Acid medium
 - b. Base medium
3. Color fastness to water
4. Color fastness to Sea water
5. Color fastness to Dye transfer
6. Color fastness to Chlorinated pool water
7. Color fastness to Rubbing
8. Color fastness to Ozone
9. Color fastness to Light
10. Color fastness to Perspiration & light
11. Fabric weight
12. Fabric strength Tear strength
13. Ph Value
14. Formaldehyde content

Chapter - 11

** Machine description for dyeing section:

Total no of dyeing m/c : 15

Sample dyeing m/c : 07



Fig: 01 Sample dyeing m/c

Machine name : A.K.M Dyeing m/c
Made in : Asian Kindom Machinery Industry co.Ltd
Machine type : Sample dyeing m/c
Machine capacity : 15 kg
Liquor ratio : 1: 5-7
Maximum press heat exchanger : 5kg/cm²

Maximum heat exchanger : 140°C

Fabric speed : 350 yd/min

MFC no : Amt02858

Date



Fig: Sample dyeing m/c

Machine name : A.K.M Dyeing m/c
Made in : Asian Kindom Machinery Industry co.Ltd
Machine type : Sample dyeing m/c
Machine capacity : 25 kg
Liquor ratio : 1: 5-7
Maximum press heat exchanger : 5kg/cm
Maximum heat exchanger : 140°C
Fabric speed : 350 yd/min
MFC no : Amt02858

2

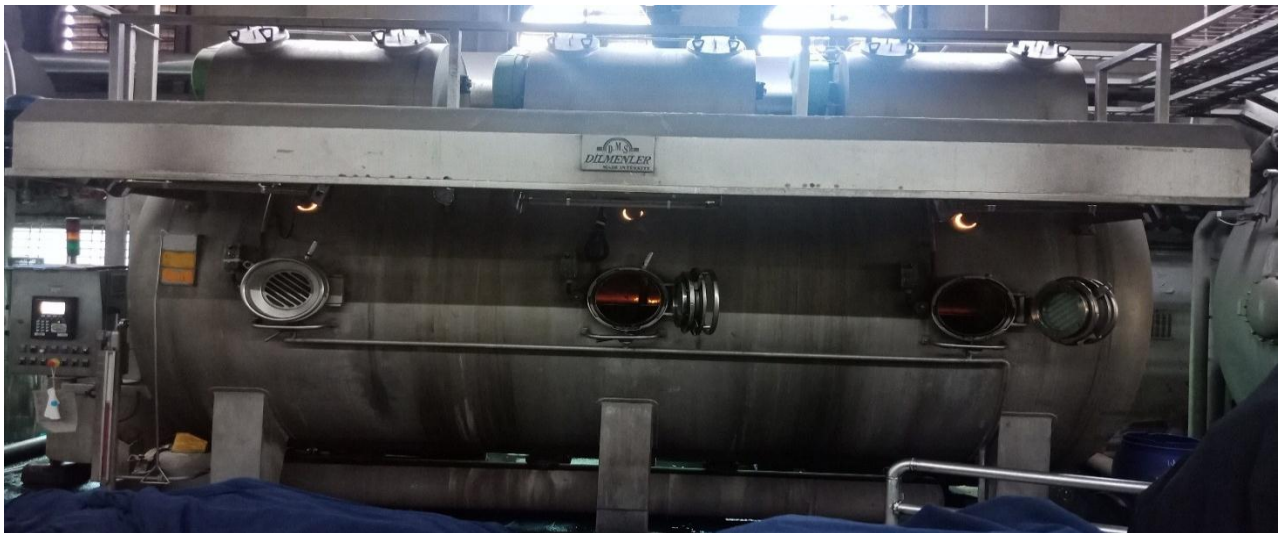


Fig: 03 Bulk dyeing m/c

Machine name : A.K.M Dyeing m/c
Made in : Asian Kindom Machinery Industry co.Ltd.
Machine type : Nom-702
Machine capacity : 280-400 kg
Liquor ratio : 1:5 -7
Heating Area : 2.3 m²

Maximum press heat exchanger

Maximum heat exchanger

Fabric speed

MFC no

Date



Fig: Bulk dyeing m/c

Machine name : A.K.M Dyeing m/c

Made in : Asian Kindom Machinery Industry co.Ltd.

Machine type : Nom-705

Machine capacity : 250-300 kg

Liquor ratio : 1:5 -7₂

Heating Area : 2.3 cm

Maximum press heat exchanger : 5kg/cm

Maximum heat exchanger : 140°C

Fabric speed : 350 yd/min

MFC no : Amt02858

Date : 2001.5

2



Fig: 05 Bulk dyeing m/c

Machine name : A.K.M Dyeing m/c
Made in : Asian Kindom Machinery Industry co.Ltd.
Machine type : Nom-705
Machine capacity : 140-200 kg
Liquor ratio : 1:5 -7₂
Heating Area : 2.3 cm
Maximum press heat exchanger : 5kg/cm
Maximum heat exchanger : 140°C
Fabric speed : 350 yd/min
MFC no : Amt02858

2

Chapter - 12

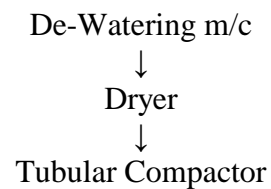
Dyeing Finishing

** Objects of Finishing:

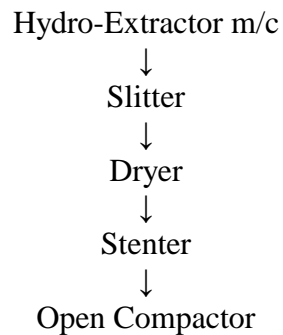
1. To improve the attractiveness of the fabric.
2. To increase the life time or durability of the fabric.
3. To meet up specific requirement of the fabric for achieve the final goal.

Process Sequence of Finishing Machine:

Tubular Fabric:



Open Fabric:



**** Technical Parameter of Finishing Machineries**

De-Watering m/c:

Technical Parameter:

Manufacture	Corino,Italy
Fabric Passing Speed	Depends on Count & GSM For low GSM fabric : 60-65 m/min. For medium GSM fabric : 55-58 m/min. For high GSM fabric : 50-52 m/min.
Overfeed Regions	J-box, Before Padder 1 & Padder 2
Pressure in Padder	Padder 1 : (4-5) bar Padder 2 : (3.5-4) bar
Types of Softener Used	Cationic Softener pH : (4.5-5) Concentration of Softener : 10g/l Bath is Changed after every 100 kg fabric.
Dia of Shaper	Max. : 52 inches Mini. : 18 inches
Water Recovery	(140-150) %
Power Consumed	400 v , 50 Hz

Function:

- To remove the excess water inherited by the fabric during Dyeing.
- To Clean any Unnecessary dirt or hairs of fibers.
- To soften the fabric if required by using softening agent.

**** Dryer:**Technical Parameters :

Manufacture	DILMENLER,Turkey
Temperature	For Colored fabric : Chamber 1 :140 ⁰ C Chamber 2 :150 ⁰ C Chamber 3 :130 ⁰ C For White fabric : All Chamber : 120 ⁰ C
Working Width	3000 mm
Speed	(8-80) m/min.
Nozzle distance	(35-55) mm
Power Consumption	140 w

Function:

- To dry the wet fabric.
- Control the shade & GSM slightly.

****Tubular Compactor:**Technical Parameters:

Manufacture	TUBETEX,USA
Speed of passing fabric	(22-40) m/min.
Shaper length	According to required Dia
Overfeed ratio	Edge drive zone : (1.0 -1.5) Retard roller : (0.80 – 0.85) Take-out zone : (0.85 - .90) Conveyer belt : (1.0 -1.05) Plaiter : (0.80 – 0.85)
Compaction%	According to Shirnkage result S/J : (10-15)% Rib : (10-12)%

	Interlock : (8-10)% Pique : (7-8)%
Shoe Pressure	S/J –large dia : avg. 30 psi S/J –smaller dia: (10-15)psi Rib : (10-20) psi Lycra : < 10 psi
Power Consumed	80 Kw
Thermo-Oil Temp.	90 ^o C

Function :

- To control Dimensional stability of fabric.
- To control GSM of fabric.
- To make shiny effect on fabric surface

**** Slitter machine**

Technical Parameter :

Manufacture	BIANCO,ITALY DILMENLER,TURKEY
Speed	Varies with type of fabric
Overfeed	In feed zone,Cutting zone, Conveyor belt (20-30)%
Pressure	In De-twister zone:0.5 bar In Padding: (4-5) bar

Function:

- To Slit-cut the tubular fabric through the needle mark.
- To remove excess water.
- To prepare the fabric for next operation.

****Open Width Compactor:**

Technical Parameters:

Manufacture	LAFER,ITALY
Max. line speed	60 m/min.
Usable line speed	30 m/min.
Max. Dia	95 inch
Workable Dia	90 inch
Steam box Temp.	80 ^o C
Feed R/L Temp.	105 ^o C
Over feed	Upto 50%
Shoe pressure	Max. : 18 Mini. : 5

Function:

- To compact the fabric.
- To control the shrinkage.
- To maintain proper width & GSM.

Condition:

- **Deep shade & Yellowish:** Temperature , Pressure should low but Stream should high.
- **Light shade:** Temperature , Stream should high but Pressure low.
- **GSM:** High Stream is increase GSM.



Figure : Open Width Compactor

Squeezer M/C:



Fig: Balloon squeezer machine for tube knitted fabrics Dewatering of knitted fabrics with a traditional hydro extractor

results creases and wrinkles. These can be avoided by installing our GURUSON balloon squeezer. It solves the problem and also brings two semi-continues

operations into a single, continuous process of extraction and plating. This machine can open, untangle, extract stretch and well compact knitted fabric continuously in a single operation.

Balloon squeezer with double padder

****Technical specification:**

Power : 15Kw, 415V, 3Phase, 50 Hz

Nip pressure : 1st Nio: 0-100 kg/cm²

2nd Nio : 0-20 kg/cm²

Working width : 12-55 inches

Air consumption :

Machine speed : 1-60m/min

Overfeed : 100% to 150% adjustable

Plating length : 80 cm. Approx

** Heat setting machine for tube knitted fabrics:



Heat setting machine for tube knitted fabrics GURUSON Heat Setting Machine is specially designed for Lycra Fabric, P.C., Polyester, spun and all type of blended fabrics. In fact the machine is required to remove crush marks, Crease Marks & wrinkles of tube from fabrics. After process the fabric comes out with excellent finish in plated form.

****Salient :features**

Auto plating of fabrics, smooth running, excellent finishing of fabrics, semi auto user friendly, less man power required for operating, easy handling of fabrics, all motor supported with A.C. drive, efficient steam chamber, adds moisture at entry point in dry fabric, absorbs moisture to each core of fiber, adjustable structure to give required width, thermo set the fabric in even form. Steel roller, cooling chamber prevents

change of color, trolley attachment.

Motor load : 5 Kw.

Heating load : 32 Kw.

Steam required : 50 kg/hr.

Running speed : 3 to 15 m/min.

**** Steam calendar machine:**



Fig: Steam calendar machine

GURUSON Steam Calendar is specially designed to press and finish the 100% Cotton fabric, sinker, interlock, knitted fabric in tube form. We have got two models one is single roll and other double roll. Temperature between the rolls is controlled up to 125° C. The machine is available in four different sizes i.e.36", 48", 60", 72" working width. The motorized and magnetic stretcher is provided to keep the width of fabric constant and makes it possible to obtain the desired overfeed.

Salient :features

Plc & touch screen

Motor supported with V.F.D.

Magnetic stretcher

Maximum working width : 1500mm.

Minimum working width : 300mm.

Working speed : 40 m/min.

Electric load : 5 H.P.

Steam consumption : 100-200 kg./Hr.

Overall dimensions : 2900x1900x1850 (WxLxH)

Chapter - 13

*** Inventory control:

There are TWO types of Inventory Control System Mashriquee Textile Ltd

- ✦ Monthly inventory control
- ✦ Annual inventory control

**Types of inventory carried in this mill is as follows:

- ✦ Grey fabric: Prepared in this factory
- ✦ Dyes and chemicals: Imported
- ✦ Machines parts: Imported
- ✦ Packing materials: Imported

** Inventory system of Raw materials:

- ✦ Basically Dyes and chemicals are stored to separate store.
- ✦ Grey fabric is stored to the grey store after prepare the fabric from knitting.



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Chapter - 14

** Other Machines in Ground Floor:

Boiler:



Fig: Cochran Boiler, Fire Tube

TYPE- SMOKE TUBE PACKAGED BOILER		CERTIFICATE NO	
MODEL	DL-2	MODEL	DL-RC-250
ACTUVE EVAPORATION	1500 kg/hr	CAPACITY	1500 kg/hr
DESIGN PRESSURE	1 MPa	POWER	1.5 MW
DESIGN TEMPERATURE	183.2 °C	TYPE	TURBO
HEAT EFFICIENCY	90 %	CAPACITY	1500 kg/hr
FUEL CONSUMPTION	114 kg/hr	POWER	1.5 MW
HEATING SURFACE	22 m ²	TYPE	FULL SIZE
MANUFACTURE NO.	2003-37-30	NOMINAL SIZE	40" x 30"
MANUFACTURE DATE	2003-2	SETTING PRESSURE	1 MPa
		CAPACITY	1500

DAE LIM ROYAL BOILER CO. LTD

Fig: Boiler Specification

** Generator:



Fig: Gas Generator

Generator:

Stoichiometric, 6 to 150 kW, are designed for applications of gaseous fuel as a result of fuel contaminant, economic.

A special complete selection features of voltages, accessories, and generator set and control options are available for customizing to your application. Major features include:

Multiple control system options, including NFPA 110 compliance Natural gas, propane or combination fuel systems Weather-protective and sound-attenuated enclosures address environmental concerns for outdoor installations

Strong motor-starting capability and fast recovery from transient load changes to

keep your site operational

Some models are available with optional closed-loop fuel control systems and three-way catalyst to limit emissions to 1.5 grams per brake horsepower hour

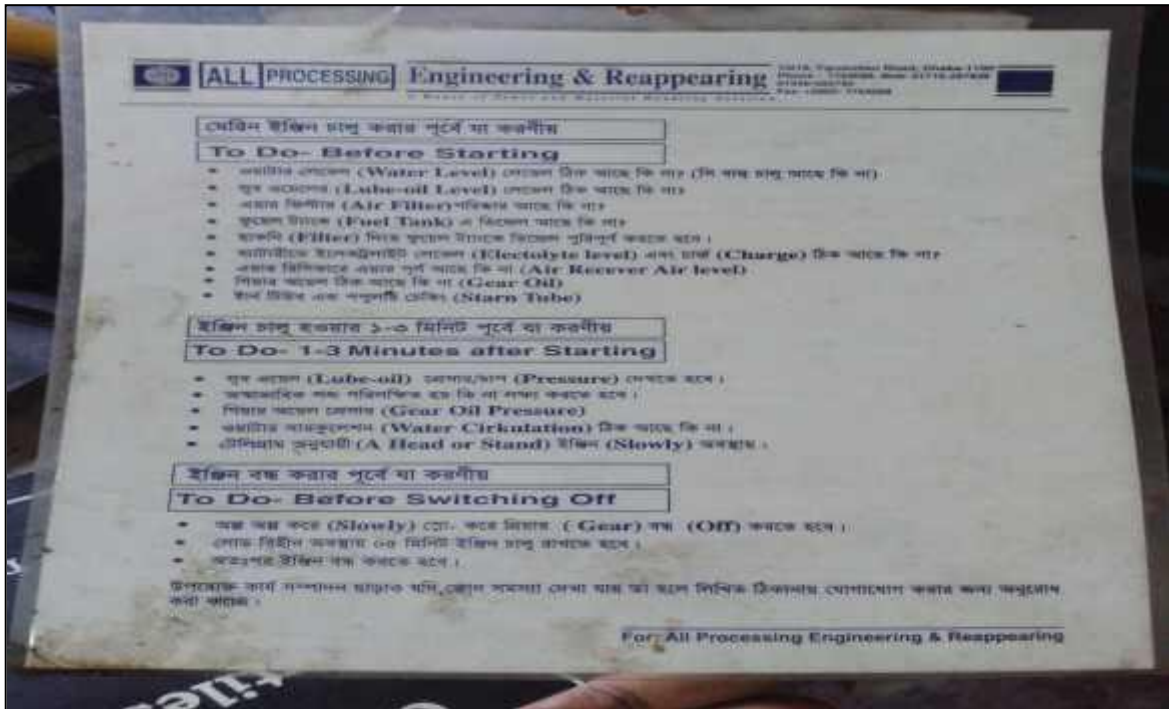
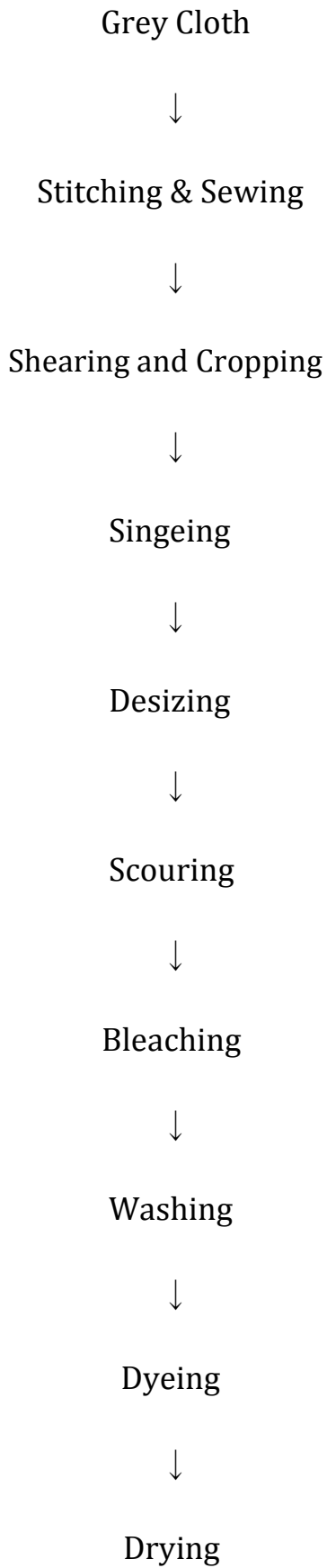


Fig: User Manual

** Flow Chart of Cotton Knit Fabrics Dyeing:



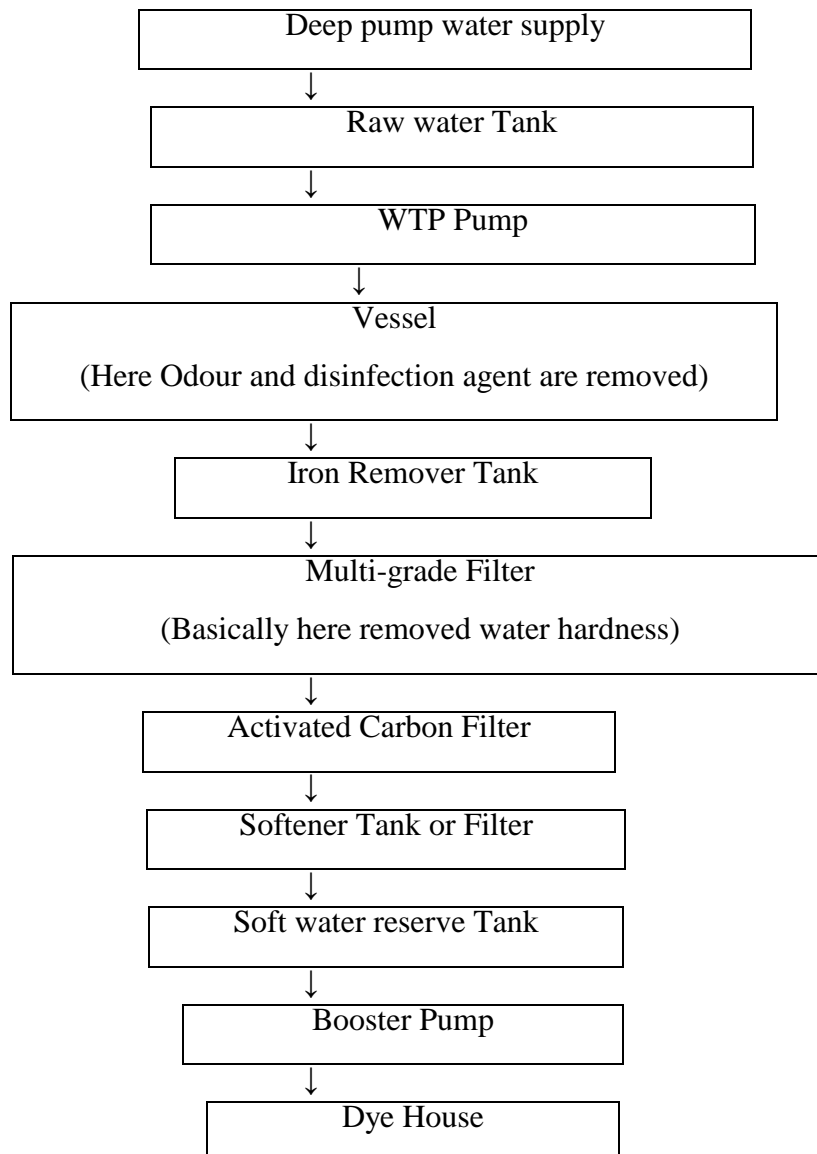
CHAPTER - 15

** WTP (WATER TREATMENT PLANT)

** WATER TREATMENT PLANT (WTP):

Water treatment plant is the plant where ground water is collected by textile industries and remove the water impurities for textile dyeing process. Water treatment plant is very important because without proper water treatment (that means removing all impurities from water) textile dyeing will not occurs properly. For this WTP is very essential for every textile wet processing industry.

** PROCESS OF WTP AT MASHRIQUEE TEXTILE LTD:



**** CHEMICAL LIST & FUNCTION:**

Chemical Name	Function
Common Salt (NaCl)	Resin Generation
Sodium Hypo-Chloride	It used for odour removal ,water disinfection agent.
Hydro-Choloric Acid	pH Control

****WATER MANAGEMENT:**

Mashriquee Textile Ltd are trying to reduce dependency on underground water by deloping –

- Rain water harvesting plant.
- Re use m/c cooling water & Steam condensate.
- Establishing the control on water consumption in Process.
- Re use of wash & surface water.



Figure: Water Treatment Plane

Chapter - 16

**ETP (Effluent treatment plant)

**** Effluent treatment plant (ETP):**

ETP (Effluent Treatment Plant) is a process design for treating the industrial waste water for its reuse or safe disposal to the environment. Now a days effluent treatment plant is very necessary for all textile industry. Because without ETP the pollutate water dispose to the environment that's why the environment become pollutate by this polluted water

****Types of ETP:**

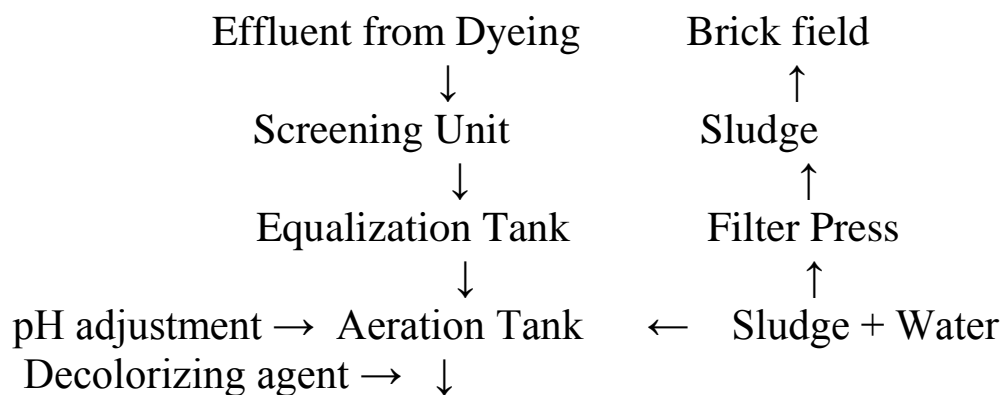
- Chemical ETP
- Bio-chemical ETP
- Biological ETP

**** Biological ETP:** Biological ETP is the process where the waste water is treated by using micro-organism (mostly use bacteria). In biological ETP plant the bacteria remove or reduce the concentration of organic or inorganic compound.

The basic units needed for biological treatment are:

1. Screening;
2. An equalization unit;
3. A pH control unit;
4. An aeration unit; and
5. A settling unit.

**** Process of Biological ETP**



Sedimentation Tank



Post Aeration Tank



Drain → Canal

****Chemical List & Function:**

Chemical Name & Micro-Organism	Function
Acetic acid	It control the pH.
De-Coloration	It remove the color from Waste water.
Urea	It used for food of Bacteria.
Bacteria	It remove or reduce the concentration of Organic & Inorganic compounds.



Figure : Screening Unit

Chapter - 1

** Garments Production Process:

Stepwise garments manufacturing: sequence on industrial basis is given below:

Design / Sketch



Pattern Design

Sample ↓ ↓ Making

Production Pattern



Grading

Marker ↓ ↓ Making

Spreading



Cutting



Sorting/Bundling



Sewing/Assembling



Inspection



Pressing/ Finishing



Final Inspection



Packing



Dispatch

** Merchandiser:

The initial stage of operation after buyer approval (sample) .the merchandisers also submit the required price recognizing all the aspect for the garments and send to the buyer the unit cost of the garments with the samples. In this time they also estimate the lead time and made an agreement how the shipment will done and other things.

** Design:

It is given by buyers to manufacturers containing design including manually measurements of particular styles or design.

** Sample making:

Make a sample, this will be approved by buyer. After making a sample, its sent to buyer for approval to rectify the faults.

** Production pattern:

To making allowance with net body measure for bulk production is manually.

** Marker Making:

According to the requisition, while all the materials came in to the SKFLs store room then this Department starts their work. For marker making they are working to manually marker making system. The efficiency of the marker making fully depends on the planning. Usually it varies from 80-85%. If the attachment is less then efficiency rises up to 90%.

** Spreading:

To manually spread the fabrics on the table correctly for cutting section.

** Cutting:

According to the marker use four cutting machines. Where one is fully manually run by fabric lay and others are manually operated. Before cutting the fabric are spread into the cutting bed by manually. After fabric spread and fabric cutting by Knife Roller cutting m/c. Two machines are employed for this purpose.

** Fusing:

In the fusing section four fusing machine are use to join interlining. And also Collar, Cuff and Tapes are separated here also.

** Sewing:



After cutting the individual parts, they are sending to the sewing department. In the sewing Department total 38 teams are working and each group is working on different buyers. End of every line there is an inspection table and for every three line there is a QAD supervisor to ensure the quality of the product.

** Ironing & Finishing:

After sewing we will get complete garments which are treated with steam ironing & also finishing processes are done for extra loose or hairy thread cutting by manually.

** Store & Delivery:



Fig: Finishing Section

After the QC department approval the products are packed and send to the store room and then they are ready to deliver to the customer or buyer.

** Sample Department:

This Department is work to submit the samples according to the buyers requirements for approval. They also maintain the previous approved samples for display.

** Training Department:

An individual Department is work here to develop the employers

performance and other aspects of the organization.

** Printing and Embroidery Department:

Liberty Knitwear Ltd. has a screen printing department. Where two fully automated machines and an automated curing machine is working. Here the graphics design unit, table printing unit screen developing unit and color preparing unit also available. They only print the buyers given design and not done any own created design for printing. In Pacific Fibre Corporation has also modern machinery decorated Embroidery section and produces more decorative design and construction.

** Distribution Unit:

This Department is supply the garments trimmings, equipments for the garments machines if need and also do the maintenance program and record the necessary floor works informations.

** Costing:

Costing is a process by which the setting price of a product is calculated. It is a very important task for a factory, which runs for business purposes. And it is also strictly followed in the NCL. Costing of the products considering the raw materials expenditure, salary and wages of officers and workers, distributions and advertisement expenses etc. all direct and indirect expenses is done in this factory. It is determined by a troop of accountants with advice and consultancy of executive director.

** Price of the Product:

Generally price of product is determined by the required profit adding to the total expenses.

So, Price of products= (Direct expenses + Indirect expenses + Factory

Overhead) + Required profit

**** Classification of Label:**

Liberty Knitwear Ltd. has a small Label industry. They produce various types of decorative labels. Labels can be classified as follows;

****According to End Use :** Main Label: it is used to describe various types of informations like fiber composition of the garment/textile, logo of the company, name of the manufacturing country etc.

****Size label :** it is used to describe the size of the garment/textile, e.g. small (S), medium (M), large (L), extra large (XL) etc,

****Extra label :** This type of label is introduced recently they are attached at the placket or at the bottom part of the shirt or any other part.

****Care label :** It is used to describe care instructions or symbols like i.e. washing, bleaching, drying, ironing and/or dry washing etc.

****Sticker label:** This type of labels is fancy items and is attached to various types of articles either to show the brand names and other details or enhance their customer acceptability.

****Size and label :**

S =Small.

M =Medium.

L =Large.

XL =Extra Large

XLL =Very Very Large

Chapter - 18

Dyed sample attachment:

S.L	Recipe	Sample
1	F. Yellow GDR=2.8% F. Red WHR=1.2% F. Black- B=1.2% 60/15	
2	S. Yellow SPD=0.47 F. Red 4GL=0.33% F. Black-B=0.42% 30/7	
3	YellowSPD=0.5% F. Red 3BS=0.38% Blue HERN=0.6% 20/5	
4	S. Red3BS=0.28% S. Yellow SPD=0.56 R. Blue LW=0.6% 20/5	
5	R. Yellow 4GL=1.2% R. T/G=0.002% 30/7	

**** IMPACT OF INTERNSHIP:**

By means of the practical knowledge it's possible to apply the theoretical knowledge in the practical field. For any technical education practical experience is almost equally important in association with the theoretical knowledge.

The industrial attachment is the process which builds understanding skill and attitude of the performer, which improves his knowledge in boosting productivity and services. University education provides us vast theoretical knowledge as well as more practical attachment, despite all these industrial attachment help us to be familiar with the technical support of modern machinery, skillful about various operation stages.

It also provides us sufficient practical knowledge about production management, Productivity evaluation, work study, efficiency, industrial management, production planning & control, production cost analysis, inventory management, purchasing, utility & maintenance of machinery and their operation techniques etc. the above mentioned can not be achieved successfully by means of theoretical knowledge only. This is why it should be accomplished with practical knowledge in which it is based on industrial attachment makes us reliable to be accustomed with the industrial atmosphere & improve courage & inspiration to take self-responsibility.

We have prepared this report as required in completion of our attachment course in regarding guideline given by the University's authority which will lead to a strong guideline & milestone for our future carrier.

Conclusion

Two months industrial training in Liberty Knitwear Ltd. was a concluding part of the B.Sc. in Textile Engineering course which enables graduates to attain sound practical knowledge. It gives us an orientation to ourselves`1`s with the practical as well as theoretical knowledge.

It was a great pleasure for us to work in of Liberty Knitwear Ltd. which provides us a wide range of scope. All the employees tried to give optimum service to us at Liberty Knitwear Ltd.

From the learning point of view we can say that we really enjoyed our internship from the very beginning. We are much confident that these two months internship program at this Garments factory will definitely helps us to realize our future carrier in the job.

Last of all, we would like to thank all the officers & other stuffs that helped us by their active cooperation. We are lucky because we completed our internship in a well known industry which will help us in future job market.

We think this training must assist us in our future industrial work.