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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

ENVOY TEXTILES LTD.

Jamirdia, Bhaluka, Mymensingh,
Bangladesh.

Course Title: Industrial Attachment
Course Code: Tex-442
Group: (B)

Submitted By

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Md. Reja Uddin Sujoy	**TEX 1703012063**	**B**
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Academic Supervisor

Kamrul Hassan Bhuiyan

Lecturer & Coordinator

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Sonargaon University (SU), 146 Mohakhali, Dhaka-1212

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

Major in Wet Process Engineering

Date of Submission: 13.03.2021

A REPORT ON INDUSTRIAL TRAINING

AT

ENVOY TEXTILES LTD

Training Program for the Department of Textile Engineering,

Sonargaon University (SU)

From: 11-Apr-2020 to 11-Jun-2020

SUBMITTED BY

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Department of Textile Engineering

Sonargaon University (SU)

In The Name of Almighty Allah

Letter of Transmittal

Date: 27 Jun 2020

Kamrul Hassan Bhuiyan

Lecturer & Coordinator

Department of Textile Engineering

Sonargaon University (SU), 146 Mohakhali, Dhaka-1212

Subject: Submission of industrial training report.

Dear Sir,

With due respect, we the students of Textile Engineering, Sonargaon University (SU) have successfully completed our industrial training program. In this stage we are submitting our industrial training report as part of our B.Sc. in Textile Engineering Degree requirement that bears three (03) credit hours under your supervision. We are submitting this report for our academic purpose only.

Please be kind enough to evaluate this dissertation with your valued suggestions.

Sincerely yours-

Name	ID	Group (AM)
Rubel Hossain	**TEX 1703012162**	**B**
Md. Reja Uddin Sujoy	**TEX 1703012063**	**B**
Md. Monjil Hossain	**TEX 1702011039**	**B**
Md. Sakil Hossain	**TEX 1703012028**	**B**
Sri Nayon Sarker	**TEX 1703012061**	**B**

Letter of Approval

The industrial training report submitted by **Rubel Hossain; TEX 1703012162, Md. Reja Uddin Sujoy; TEX 1703012063, Md. Monjil Hossain; TEX 1702011039, Md. Sakil Hossain; TEX 1703012028, Sri Nayon Sarker; TEX 1703012061,** Department of Textile Engineering, was carried out under my supervision and has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Bachelor of Science in Textile Engineering.

Date: October, 2020

.....

Kamrul Hassan Bhuiyan

Lecturer & Coordinator

Department of Textile Engineering

Sonargaon University (SU)

146 Mohakhali, Dhaka-1212

Acknowledgement

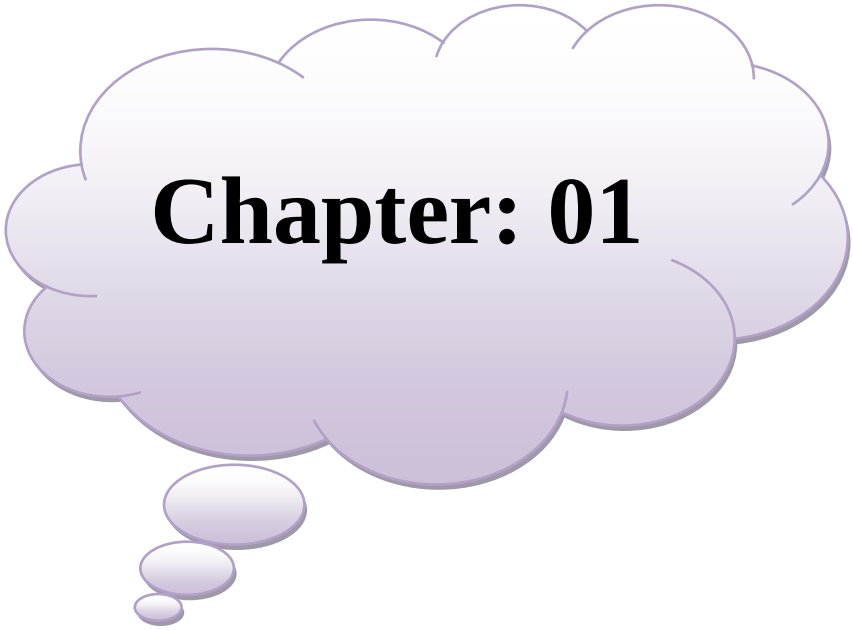
At first, our gratefulness goes to Almighty Allah to give us the strength and ability to complete the industrial training and this report. You have made our life more beautiful and peaceful. May your name be exalted, honored, and glorified all over the universe.

Now we wish to take this excellent opportunity to thank a lot of people who have assisted and inspired us in the completion of my training period.

We sincerely thank our advisor **Kamrul Hassan Bhuiyan,** Lecturer & Coordinator, Department of Textile Engineering, Sonargaon University (SU), 146 Mohakhali, Dhaka-1212 for their continuous encouragement and valuable suggestions.

We would like to thank the management of the textile. For giving us the opportunity to do the industrial training successfully and also their valuable suggestion. The generous support is greatly appreciated. Also, like to thank executives, senior executives and other officials of Amana Textile Ltd. for helping us to complete industrial training successfully. Our gratitude also goes to the employees of ENVOY TEXTILES LTD. For their sincere co-operation, support and valuable advice.

Last but not least, thanks go to our precious family for their never-ending love and inspire at every stage of our life.



Chapter: 01

Introduction

1.1Introduction

By achieving Practical knowledge it is possible to apply the theoretical knowledge in the technical field. For any technical education, practical experience is almost equally necessary in association with the theoretical knowledge. The Industrial attachment is most effective process of achieving the practical experience. It provides me sufficient practical knowledge about production, management, productivity, evaluation, work study, efficiency, Industrial management, production planning & control, Production cost analysis, utilities and Maintenance of machinery and their operation technique etc.

Industrial attachment is an essential part of four years B. Sc in Textile Engineering course of "**Sonargaon University".** I had the opportunity to perform the industrial attachment with "***ENVOY TEXTILES LTD***." During thirty six days long attachment, I studied the man, machine, material aspects of the Ball Warping section, Dyeing section, LCB, Sizing section, Weaving section, finishing section, grey fabric inspection, quality control section, planning section, , and R&D section of the factory. According to my studies there I have prepared the following report and would like to present.

I have tried to my best to prepare this note book applying my best efforts. I have tried to gather all the necessary information to make it a valuable for me as well as for everyone. I think it will help me a lot in the future practical life.

1.2 Industry Profile

Envoy Textiles Ltd. is a 100% export oriented Industry for Denim fabrics. Envoy Textiles Ltd. is well equipped with modern and sophisticated European state of the art textile and managed by a vastly experienced management. Envoy Textiles Ltd. committed to render best service on timely shipment of order to the valued customers all over the world.

Fig: Front View of Envoy Textiles Ltd

Envoy Textiles Limited, leading denim fabric producer in Bangladesh since 2005, started the commercial production in early 2008. This industry is professionally managed and technically sound organization located at Bhaluka, Mymensingh (60 km North of Dhaka City).The plant is fully integrated with State of the Art technology and machinery from USA, Japan, Korea, Switzerland, Italy, India& Belgium. **Envoy Textiles Ltd.** produces indigo denim fabric with the best and most modern ROPE DYEING Technology. With ever increasing acceptance of quality fabric and increase in demand the production capacities is expanding at regular intervals.

1.3 Massage from the Founder:

PROMOTORS

Chairman (Envoy Group)
Mr. KUTUBUDDIN AHMED

ABOUT ENVOY GOUP:

Established in 1984 Envoy Group has expanded dramatically over the past two decades and built a remarkable distinction as an exporting giant company in this challenging part of the world. Diversification and quest for specialization has made the group a true leader in the face of global competition.

The Group represents 27 business enterprises at present, including 14 garments factories with around 15000 employees. The total investment in Apparel, Real Estate, Hospitality Industry, Freight Forwarding, Information Technology, Financial Institutions, Consumer Products and Trading & Textiles is approximately 80 million US dollar and annual turnover is approximately 200 million US dollar.

As an emerging business conglomerate, Envoy Group believes in the wisdom of looking not just around the corner, but over the horizon. The philosophy has been truly reflected in her multi-disciplinary operation from garment business to trading and from investment in real estate business to banking.

The Government of Bangladesh recognizes Envoy Group as one of the pioneers in the export-oriented readymade garments sector and has honored the Group by awarding the prestigious President Export Trophy And the National Export Trophy Several times.

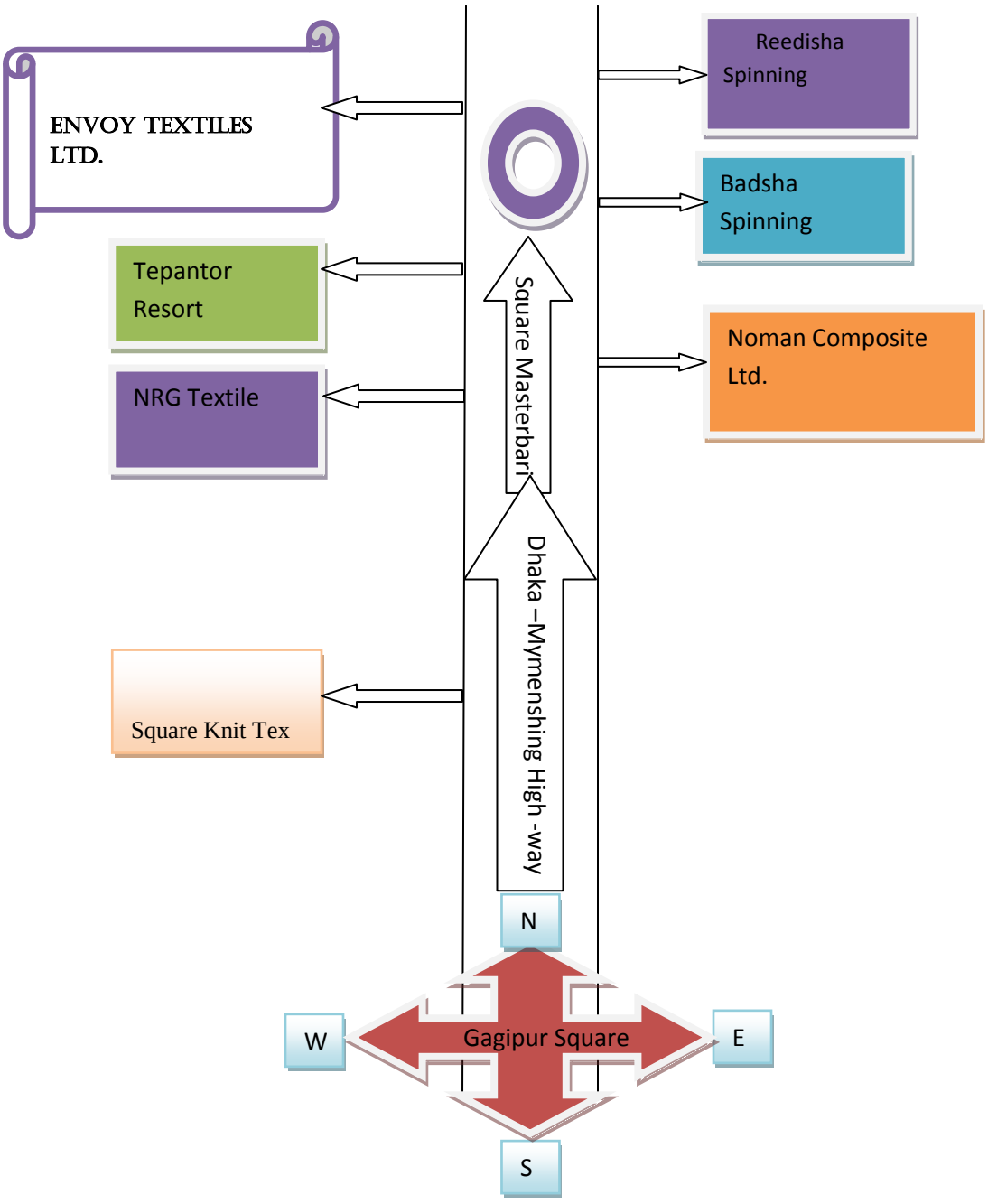
Mr. Kutubuddin Ahmed, Chairman and founder of Envoy Group, is a graduate in Mechanical Engineering from Bangladesh University of Engineering and Technology (BUET). He set up Envoy Group in 1984 and has always been the pivotal force behind phenomenal success of the establishments. From a very unmentionable start, through continuous struggle, and commitment for quality, he has overcome a lot of obstacles to bring Envoy Group in its present position. Starting with only garment manufacturing unit in mid-eighties, today the group has emerged as one of the largest and thriving conglomerates in Bangladesh.

Having entrepreneurial talent and vast experience, Mr. Ahmed has succeeded to promote and administer industrial & business enterprises in manufacturing and exporting of readymade garments, textiles, information technology, airlines, freight forwarding, hospitality industry, trading (local and international), real estate development, consumer products to name just a few.

Mr. Ahmed, over the years has been accredited with numerous awards for his active contribution towards the development of the sports community of Bangladesh. He was awarded with "National Sports Award 2002" the highest recognition for contribution as a sports organizer in Bangladesh. He has also received other notable awards, which include international Olympic Committee (IOC) Trophy "Sports and Community" to name just a few.

Mr. Ahmed has undertaken various Social-Welfare initiatives for the downtrodden people and continues to operate a number of his own charitable (non profit) organizations in various parts of the country. He also works very closely with the local community and actively takes part in local charities, sports sponsorship, youth sports, drug awareness programs etc.

1.4 Location Map of Envoy Textiles Ltd:



1.5 BASIC INFORMATION :

Name of the Company : Envoy Group
ENVOY TEXTILES LTD.AT A GLANCE:
Name of the Industry : Envoy Textiles Ltd.
Status of the Industry : Private Company Ltd.
Nature of business : 100% Export Oriented Company
Type of the Industry : Denim Factory
Owner of the Industry : Engr. Mr. Kutub Uddin Ahmed (Chairman).

1.6 Factory Address:

Envoy Textiles Ltd.
Jamirdia,Bhaluka, Mymensingh, Bangladesh.
Phone: 0682-555037-40
Fax: 0682555008

1.7 Corporate Office:

Envoy Tower
18-E Lake Circus Kalabagan
West Panthopath; Dhaka-1205
Phone: +88 0 2 9102583-90
Web: www.envoytextiles.com

1.8 ETL standard certifications of Envoy Textile Ltd. These are:

- Oeko-Tex Certified
- GOTS Certified (Global Organic Textile Standards)
- OE100 or OE Blended (Organic Exchange)
- ISO-9001:2008 Certified
- ISO-14001:2004 Certified
- BSR Audit (Business for Social Responsibility) Certified
- ETL is committed to conserving the environment and has taken concrete steps by setting up a state of the art ETP plant

1.9 Vision of the Company:

To be the most respected denim manufacturer in the region for its people ,product innovation and on time performance.

1.10 Mission of the Company:

To achieve global dominance-

- Through excellence in product quality.
- Diversify products through continuous product innovation.
- Focus on cost effectiveness.
- Customer orientation.

1.11 Strength of the Company:

- Diversified Product Portfolio.
- High Standards of quality and service.
- Own power generation.
- Effluent Treatment Plant to safeguard the environment.
- Process & Technology improvements.

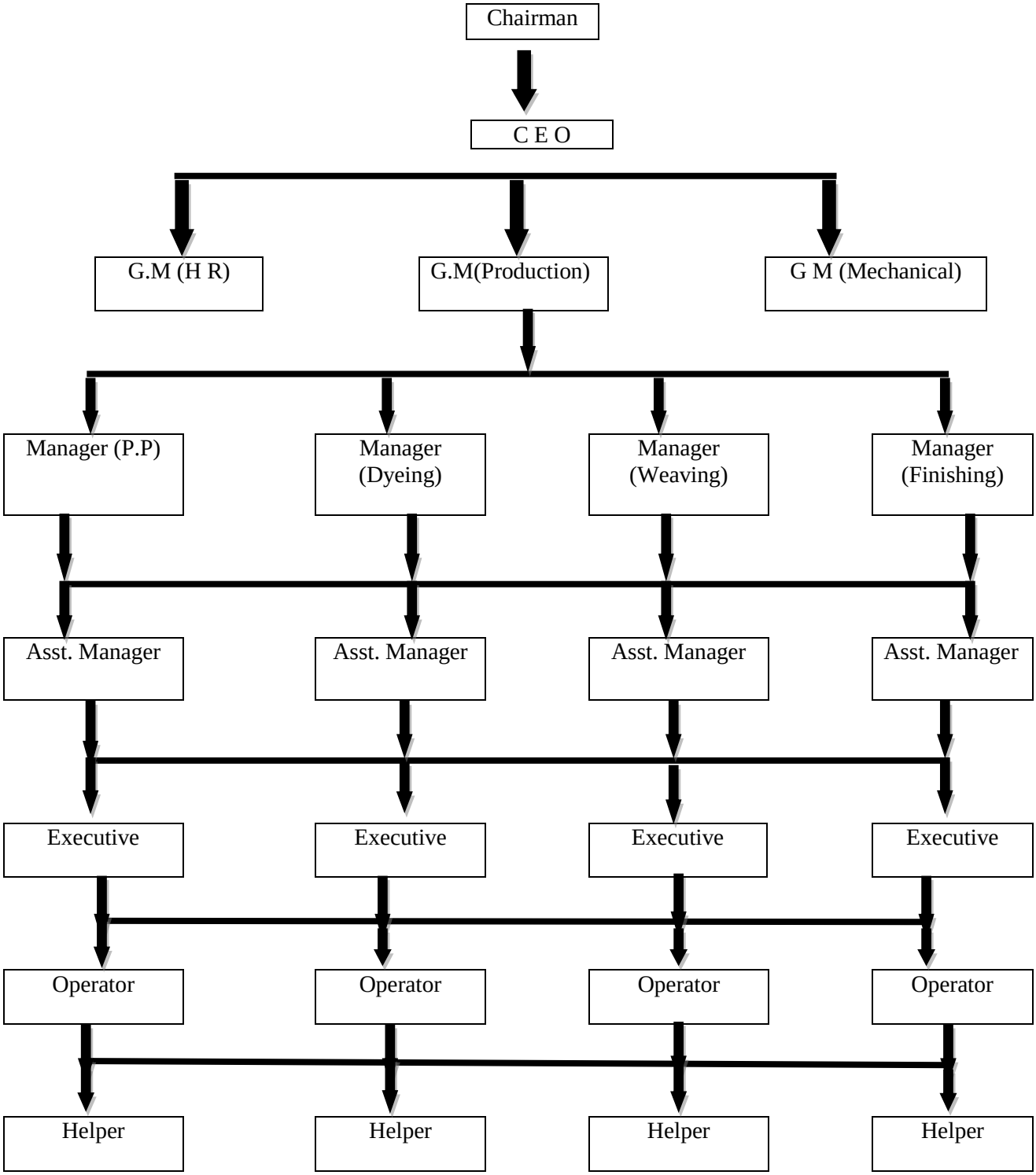
1.12 Board of Directors:

Engr.Mr. Kutubuddin Ahmed	**Chairman**
Mr. Abdus Salam Murshedy	Managing Director
Mrs. Rashida Ahmed	Director
Mrs. Sharmin Salam	Director
Mr. Tanvir Ahmed	Director
Ms. Shehrin Salam Oishee	Director
Mr. Abul Kalam Azad, FCA	Independent Director

1.13 Management Team:

Mr.Tushar Tripathi	**Chief Executive Officer**
Mr.Manish Khanna	Marketing Director
Mr.Saiful Islam	Chief Financial Officer
Mr.Nanda Dulal Biswas	Head of Production
Mr.Pronab Karmaker	Head of QA & IQC
Mr.Shama Proshad Ghosh	Head of Engineering & Utility
Mr.Nurul Islam	Head of Supply Chain
Mr.Rezaur Rahman	Head of Project Management
Mr.Hamimur Rahman	Head of HR
Mr.Enamur Rahman	Head of Administration
Mr.Mozammal Hossain	Head of Internal Audit

1.14 Organizational Structure:



1.15 Section Total Man Power: Production and Quality assurance

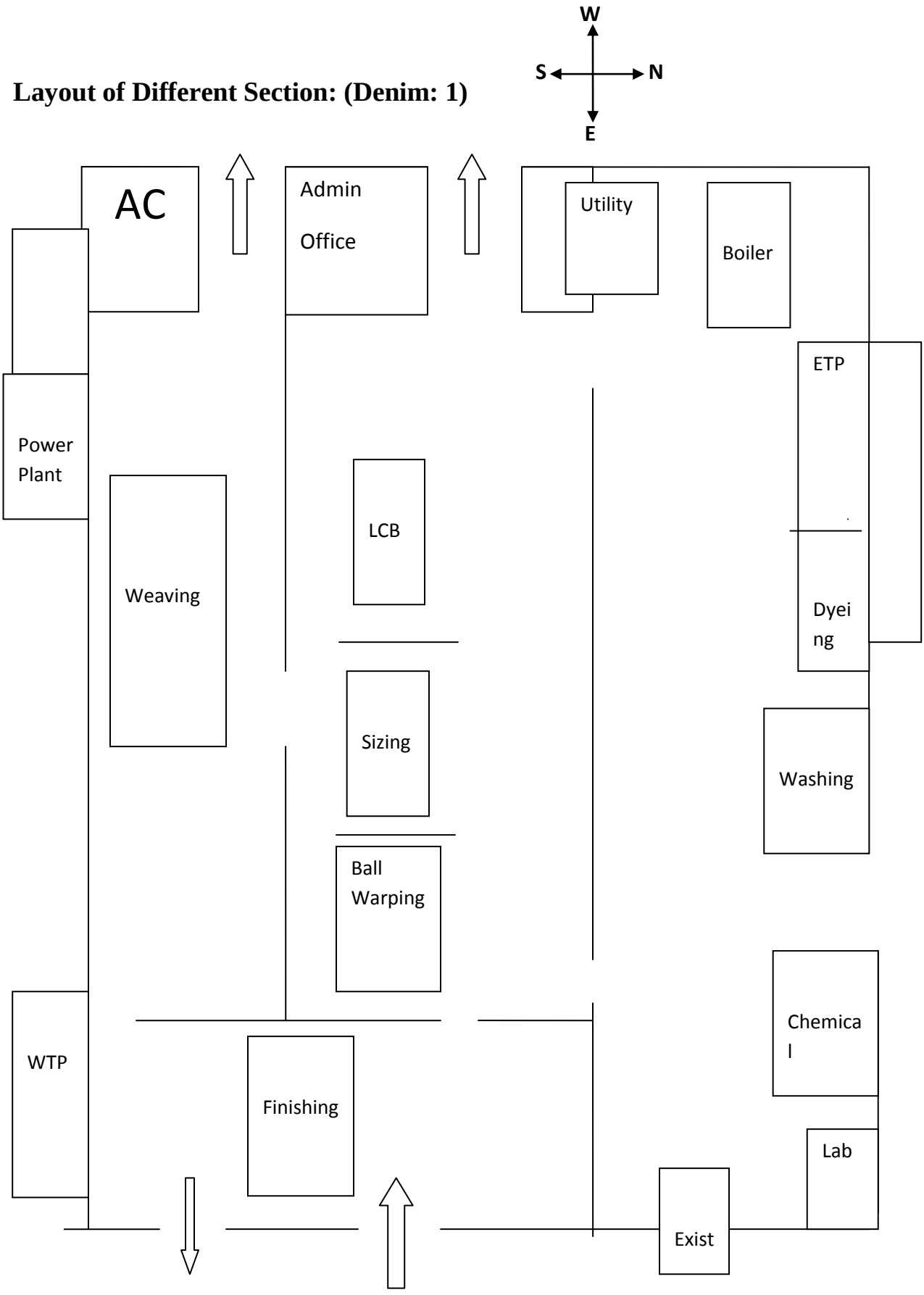
Ball Warping	102
Dyeing	91
LCB	111
Sizing	42
Loom Operation	264
Finishing	94
Inspection	76
Laboratory	19
R&D	26
Production Planning	4

1.16 Shift Management:

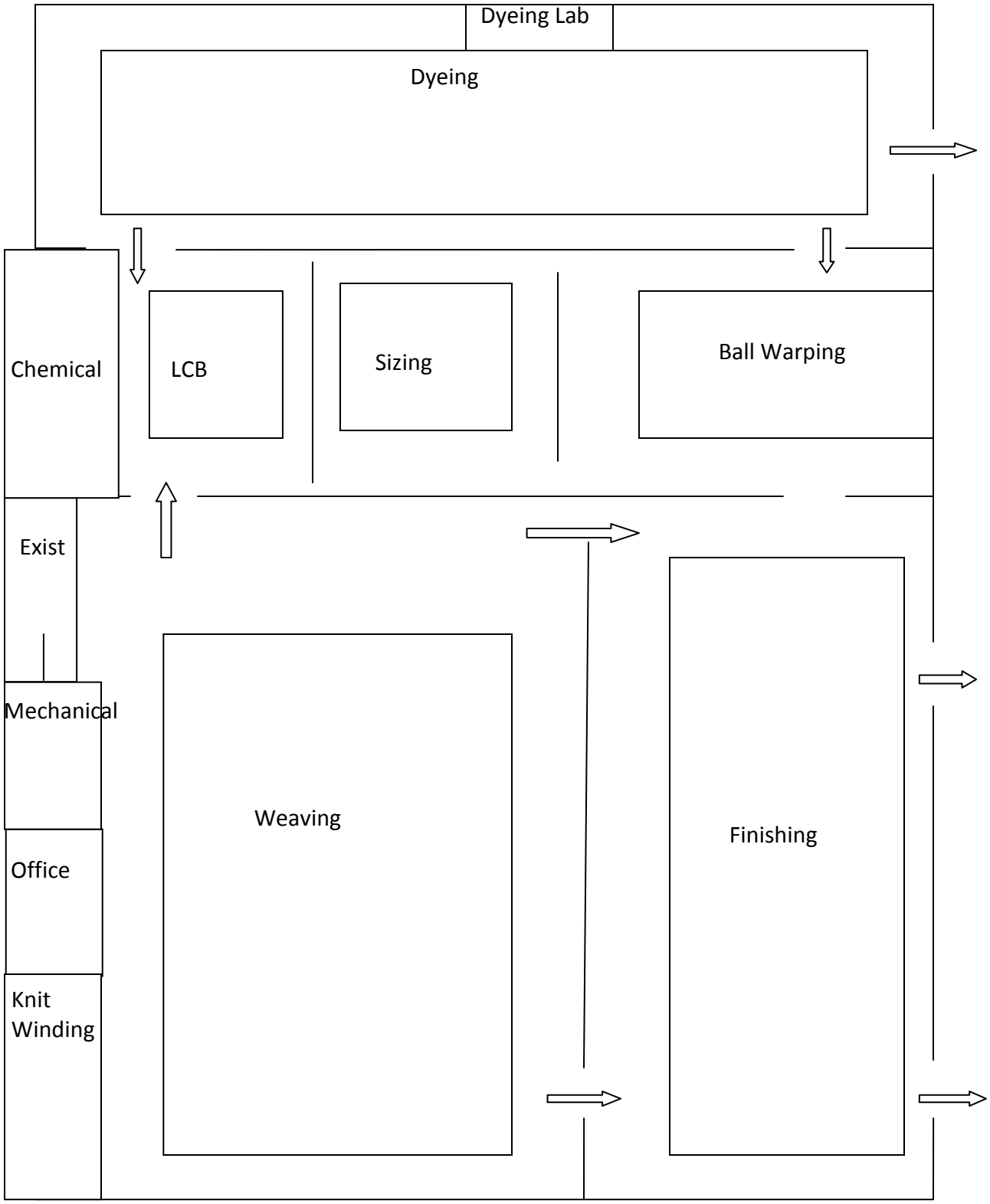
3 Shift systems are continued in Envoy Textiles Ltd. (Per shift is 08 hours)

Shift name	Period
General	9.00AM-5.00PM
A	6.00 AM-2.00PM
B	2.00PM-10.00PM
C	10.00PM-6.00AM

Layout of Different Section: (Denim: 1)



1.17 Layout of Different Section :(Denim: 2)



Chapter: 02

Raw material

2.1 Flow Chart of Rope denim Process:

Yarn from spinning
↓
Ball warping
↓
Dyeing
↓
L.C.B (Long chain beaming)
↓
Sizing
↓
Weaving
↓
Finishing
↓
Inspection
↓
Packing
↓
Ditch patch for delivery

2.2 Raw material:

In denim fabrics both yarn & Size materials are used as raw materials. There are different types of yarns are used as raw materials in this factory. These are –

2.3 Raw material for Yarn

1. Cotton yarn:
   (A). Combed.
   (B). Carded.
2. Polyester yarn:
   (A). Normal.
   (B). Spandex (Lycra).
3. TC
4. PC
5. CVC
6. PCSL

2.4 Yarn Supplier Name & Origin:

Supplier	Origin
Badsha Textile Ltd.	Bangladesh
Salek Spinning Ltd.	Bangladesh
Square Spinning Ltd.	Bangladesh
Gulsan Spinning Ltd.	Bangladesh
Jamuna Spinning Ltd.	Bangladesh
Nahar Spinning Ltd.	Bangladesh
QUETT A Spinning Ltd.	India
Suprim Spinning Ltd.	India
NRG Spinning Ltd.	Bangladesh
Shaoxing Bowarn.	China
Zheijang.	China
AA Synthetic.	Bangladesh
Sinha Spinning Ltd.	Bangladesh
Din-TEX.	Pakistan

Chapter: 03

Ball Warping

3 Ball Warping

3.1 What is warping?

Warping is transferring many yarns from a creel of single end package forming a parallel sheet of yarns wound onto a beam or section beam.

Depending on the kind of intermediate carrier used, the industrial warping process can be carried out according to two different technologies:

- Sectional warping (indirect or conical drum or dresser warping)
- Beam warping or direct warping (preparatory beam warping)

Ball warping is an intermediate process for storing yarn for transport, dyeing or reserve; In ball warping process, individual strands of yarn are removed from packages and collected into rope from suitable for rope dyeing. About 350 – 500 in number are formed into ropes. Individual warp yarn are collected into rope form and wound onto a log and produce a ball warp on ball warping machine.

3.2 Flow Chart of Ball Warping M/c:

Making Program
↓
Collect the program Specification
↓
Yarn Requisition
↓
Ready Creel for running program
↓
Run the Machine
↓
Program set on to the machine
↓
Run the program
↓
Check Creel &Operate the full program
↓
Production Calculation

3.2.1 Description of the flow chart of Ball warping section:

1. Making program:
   - Receiving the production planning sheet from the planning department.
   - After receiving the planning sheet, observed this carefully and calculate this according to the production planning department.
2. Collect the program specification:
   - After making program to ensure the yarn storage.
   - If the storage of yarn for this planning is not enough then collect the required amount of yarn. Same as like m/c, helper etc.
3. Yarn requisition:
   - During collect the program specification to check the various matters such as- materials details (count, type of yarn like 100% cotton, supplier, lot no etc),Quantity of yarn(like as 5700 kg),Reason for requisition (like as sample or production).
4. Ready creel for running the program :
   - Creeling the required amount of cone.
   - To pass the yarn from cone to head stoke into various guide, tension meter, sensor, reed box etc.
5. Run the Machine:
   - Run the machine or start the m/c for setup the program according to the production planning.
6. Program set onto the machine:
   - After starting the machine, the programs setup the machine.
   - And finally check the program and run the machine.
7. Run the program:
   - The operators run the machine.
   - And the helper helps the operator to operate the m/c and also increase the production.
8. Check creel and operate the full program:
   - During running the machine, if the yarn is breakage the operator indicate this breaking point and the helper pair the breakage yarn.
   - During running the machine, the helper again creeling the yarn to another spindle for that program or another program.

9. Production calculation :
   - After completing the full program or a shift, the shifting officer calculate the production.
   - After complete this program then running another program in same processes of Ball Warping section.

3.3 Types of Ball warping M/C: (Unit-1):

M/c no.	Manufacturer	Tension type	Max. Speed	Creel capacity	Origin	Man. year
01.	GRIFFIN	Auto tension	400m/m	456	U.S.A	
02.	GRIFFIN	Gm tension	400m/m	456	U.S.A	
03.	GRIFFIN	Gm tension	400m/m	456	U.S.A	
04.	Morrison	Auto tension	450m/m	528	U.S.A	

3.4 Types of Ball warping M/C (Unit-2):

M/c no.	Manufacturer	Tension type	Max. Speed	Creel capacity	Origin	Man. year
01.	KARL MAYER	Auto tension	400m/m	456	GERMANY	
02.	KARL MAYER	gm tension	400m/m	456	GERMANY	
03.	KARL MAYER	gm tension	400m/m	456	GERMANY	
04.	KARL MAYER	Auto tension	400m/m	456	GERMANY	
05	KARL MAYER	Auto tension	400m/m	456	GERMANY	

3.5 Parts of the Ball Warping M/c:

- Head Stoke
- Trumpet
- Meter roller
- Shaft
- Safety Guard
- Tension pulley stand
- Reed stand
- Flatting Bar
- Lost End bar
- Vacuum stand
- Creel stand
- Spindle
- Spindle stand
- Ceramic guide
- Tension disk
- Sensor

3.6 Warping Machine mainly consists of two parts:

1. Head Stoke

Figure: Head Stoke of Ball Warping

2. Creel

Figure: Creel of Ball Warping

3.7 Different Tension of ball Warping:

Count	Jog tension	Front tension	Rear tension
All 6 & 7 count	87 %	82 %	87 %
All 9 count	77 %	72 %	77 %
All 12 count	67 %	62 %	67 %
All 16 count	67 %	62 %	67 %
20 cc; 24cc; 30cc	60 %	65 %	62 %

3.8 Count Wise M/C Speed:

Yarn Type	Machine Speed
Open end yarn	320 mpm
Slub yarn	300 mpm
Ring yarn	300 mpm
Knitting yarn	200 – 220 mpm

3.9 Machine Tension, Ball force, Speed:

Count	Tension	Ball Force	Speed
6/1 Ne;7/1 Ne	40 gm	160 – 320	300 mpm
9/1 Ne; 10/1 Ne	30 gm	160 – 320	300 mpm
12/1 Ne; 16/1 Ne	30 gm;20gm	140 – 300;120-280	300 mpm
24/1 Ne;30/1 Ne	20 gm	120 -280	200 – 220 mpm

3.10 Program calculation:

PO	Style	Count &Description	Ratio	Total Ends	Length / Set	No. of rope/set	No. of Set
605	LY-106	7OE+9OF+12OE Badsha(39)+Badsha(38)+ Badsha(16)	4:2:6	4440	8000	12	2.5

Calculation:

1. **Total Ball** = no. of Ball /set X no. of set=12X2.5= 30Ball

According to the Ratio, the no. of Ball for----

7OE:4X2.5=10

9OE:2X2.5=5

12OE:6X2.5=15

And cone length calculation for, 7OE: (2.77 kg X1000) gm X 1.6933 X 7=32,900mtr

9OE: 2.77X1.6933X1000X9=42,300 mtr

12OE: 2.77X1.6933X1000X12=56,300mtr

Note: 1.6933 formulation= (840) ÷ (1.0936 × 453.6)

3. **Required Creel for** 7OE: 8000X10=80,000÷32,900=2.5=3creel

9OE: 8000X5=40,000÷42,300=0.94=1 creel

12OE: 8000X15=120,000÷56000=1.833=2 creel

Total creel required for this program, 3+1+2=6 creel

4. **Required cone Bag for this program for** ,7OE: 370÷18=20.5X2.5=52 Bag

   9OE: 370÷18=20.5X1=20.5=21 bag

   12OE: 370÷18=20.5X2=41bag

Total bag required for this program, 52+21+41=114bag

5. **And total weight of yarn for this program**, 114X50=5,700 kg

Note: Normally we are using 370; 376; 399; 401; 444; 457; ends/rope.

Chapter: 04

Dyeing section

4. DYEING SECTION

4.1 Methods of indigo dyeing:

In former times indigo dyeing was normally carried out in wood or metal vats and generally in rope form. Today indigo dyeing is carried out in a continuous process. There are mainly two types of dyeing principles for continuous dyeing, such as:

- Rope dyeing
- Slasher or Sheet dyeing

4.1.1 Rope dyeing:

The indigo Rope dyeing technology for denim production is considered a superior dyeing technology, where better uniformity of dyeing is achieved than other Indigo dyeing technologies like slasher dyeing. Indigo rope dyeing was started in USA. Today rope dyeing accounts for a large percentage of warp yarn dyed for denim production. The system offers highest production, due to continuous process, as there is no stoppage for set changes. In this dyeing method, maximum continuity of shades and minimum danger of center to selvedge shade variation can be achieved.

4.2 There are two types of dyestuffs are used:

1. Vat (Indigo) Dye
2. Sulphur Dye

4.2.1 Indigo dye:

Indigo dye is a vat dyestuff. It is insoluble in water and has a very poor affinity to cellulose fibers like cotton fiber. In normal stage, indigo will not dye cotton fiber. For dyeing of cotton yarn, indigo should be converted into water-soluble "leuco" form in chemical reduction process. Reducing agents such as sodium hydrosulfite with sodium hydroxide are used to convert the indigo dye to its soluble form.

Properties:

- Vat dyes are water insoluble
- Rubbing fastness is not so good
- It is costly in price
- Vat dyes are used for cellulose fibre dyeing.

4.2.2 Sulphur Dye:

In 1893 the chemist Vidol make a reaction of sodium sulphide and sulpher with organic base (paraphenyl enediamine or paramino phenol) and produce Vidol black. This is known as sulpher dye stuff. In some cases a sulfur black or blue dye can be applied to the yarn before indigo dyeing in order to achieve darker shades. This is known as a sulfur bottom or Bottoming Shade. If the sulfur dye is applied after the yarn has been indigo dyed, it is known as sulfur top or Topping Shade.

Properties:

- It is cheap in price.
- Wet fastness is good but light fastness is not so good.
- It is insoluble in water.
- But reacting with Na2S (reducing agent) it produce Thiol which is water soluble.

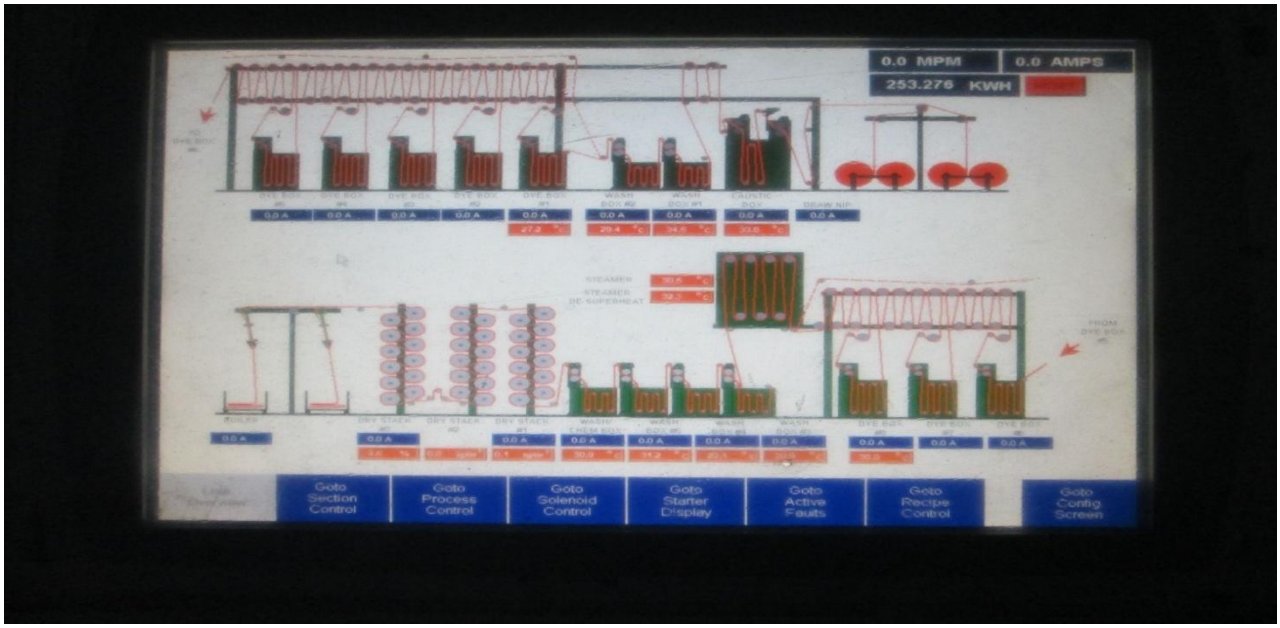
4.3 Machine Description of Rope Dyeing: Denim1

Manufacturer	Creel capacity	Speed	Origin
MORRISON	32	30m/m	USA

4.4 Machine Description of Rope Dyeing: Denim 2

Manufacturer	Creel capacity	Speed	Origin
SMARTTEC	40	30m/m	China

4.5 Rope dyeing Machine of Denim



4.6 Flow chart of Rope dyeing Machine of Denim 1 and Denim 2

MORRISON Rope Dyeing machine	SMARTTEC Rope Dyeing machine
Creel ↓ Mercerization Box ↓ Wash box(1,2) ↓ Dye Box(1 to 8) ↓ Steamer Box ↓ Wash Box (3,4,5) ↓ Softener Box ↓ Dry Cam (1,2,3 unit=36 pc) ↓ Coiler Unit (1,2,3,&4)	Creel ↓ Mercerization Box ↓ Steamer Box ↓ Wash box (1,2) ↓ Dye Box(1 to 10) ↓ Steamer Box ↓ Wash Box (3,4,5) ↓ Softener Box ↓ Dry Cam (1,2,3 unit=36 pc) ↓ Coiler Unit (1,2,3,4 &5)

Fig: Dye Box


Fig: Dry cylinder


Fig: Coiler Unit

4.6.1 Machine Parts name:

- Creel
- Creel Stand
- Eye pod
- Eye pod roller
- Rope guide roller
- Meter roller
- Squeeze roller
- Dancer roller
- Sky roller
- Nip roller
- Immersion roller
- Mercerization Box
- Dye Box
- Wash Box
- Softener Box
- Dryer cylinder
- Coiler can

4.6.2 Different Box in Rope dyeing M/c and their Volume:

Different Box	Volume
Mercerization Box	3000ltr
Wash Box	2000ltr
Dye Box	3000ltr
Wash Box	2000ltr

4.6.3 No. of various rollers in Rope dyeing M/c (Morrison):

Dye Box→ Sky roller-65, Nip roller-16, Immersion roller-24
Wash Box→ Sky roller-3, Nip roller-18, Immersion roller-24
And Total squeeze roller in full m/c→32

4.6.4 Diameter of various rollers:

1. Sky roller→14 inch
2. Guide roller→6 inch

4.6.5 Squeeze roller weight in various Box of rope Dyeing m/c (Morrison):

Mercerization Box→ squeeze roller weight-10 ton
↓
Wash box→ squeeze roller weight-5 ton
↓
Wash Box2→ squeeze roller weight-10 ton
↓
Dye Box1 →squeeze roller weight-5 ton
↓
Dye Box 2→ squeeze roller weight-10 to
↓
Dye Box (3, 4, 5, 6) →squeeze roller weight-5 ton
↓
Dye Box (7, 8) → squeeze roller weight-10 ton
↓
Wash Box (3, 4) → squeeze roller weight-5 ton
↓
Wash Box (5, 6) → squeeze roller weight-10 ton

4.6.6 Types of Valve:

1. Inlet valve
2. Label valve
3. Shower valve
4. Drain valve
5. Over flow valve

4.7 Required LAB instrument for completing the full dyeing processes:

1. Printer: For printing the various testing result.
2. Metrohm

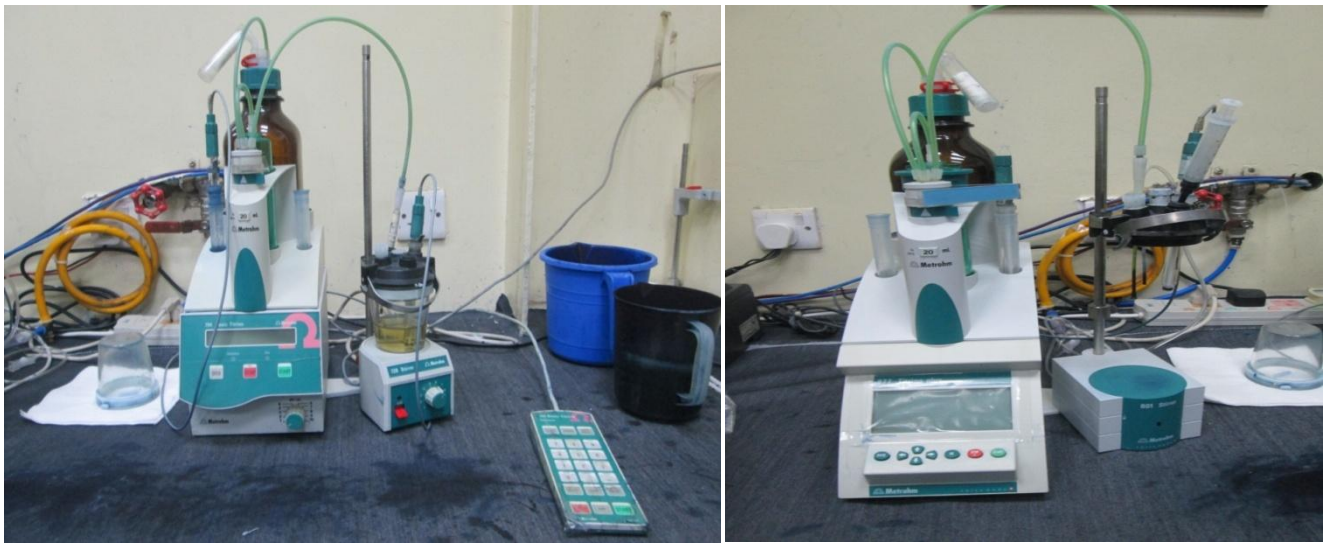


Fig: Metrohm

Machine Specification:

Metrohm	Model	Purpose
1.	877,Titrino plus	Used for Hydro and Indigo g/l tests.
2.	801 stirrer	
3.	794 Baasic Titrino	Used for PH test
4.	728 stirrer	

3. D65 light Box & Spectrophotometer

Fig: D65 light Box

Fig: Spectrophotometer

		Model	Purpose	Wave length
1.	D65 light Box	VeriVide	Used for Shade check of dyed sample.	
2.	Spectrophotometer	Lico-500	Used for check the Wave length and conc and also gm/l of sulpher.	695Nm
3.	Weight Balance m/c	Calibrated	Measure different chemical	

4.8 There are 4 types of Shades are produced:

1) Mercerization/Indigo
2) Bottoming
3) Topping
4) Black

4.9 Dyeing Recipe for Mercerization shades:

Box	M 1	W 1	W 2	DY 1	DY 2	DY 3	DY 4	DY 5	DY 6	DY 7	DY 8	W 3	W 4	W 5	SOFTENER
Oportion	m	w	w	-	-	w	w	dy	dy	dy	dy	w	-w	w	chemical
Press	60	75	70	-	-	75	75	75	75	70	70	75	75	70	70
Temp	30	25	25	-	-	25	25	30	30	25	25	35	35	35	40

Pretreatment:

Oportion→Mercerization-Caustic→3g/l
Anticilconz→2g/l
Leophen→7g/l
PH/Be→04Baume
Temperature→30c

Indigo Parameter:

Indigo→1.5g/l
PH→11.4-11.5
Hydro→.500-.600

4.10 Flow chart of Deferent Shades:

Topping Shade	Bottoming Shade	Black Shade
Mercerization Box: (Mercerized chemicals & Temp-30o C) ↓ Wash Box (1, 2) ↓ Indigo Dye Box (1 -6; depends on shade depth) ↓ Washing (Dye Box no.-7) ↓ Black Dye Box(Dye Box No.8)(Temp-85oC) ↓ Wash Box(3,4,5) ↓ Softener Box ↓ Drying Cylinder (1 - 36) ↓ Rope Can	Mercerization Box :(Black Chemicals &Temp-85o C) ↓ Wash Box (1, 2; normal wash) ↓ Indigo Dye Box (1 -8; depends on shade depth) ↓ Wash Box(3,4,5) ↓ Softener Box ↓ Drying Cylinder (3 unit - 36) ↓ Rope Can	Mercerization Bath:(Mercerize chemical &Temp-30oC) ↓ Wash Box (1& 2; normal wash) ↓ Black Dye Box (Box No.8 and Temperature 85oC) ↓ Steamer (Temp-110o C) ↓ Wash Box(3,4,5) ↓ Softener Box ↓ Drying Cylinder (3 unit - 36) ↓ Rope Can

4.11 Chemicals are required in various Boxes for various Shades:

Mercerization tank: For Box (volume-3000ltr)

Caustic	4 baume-80kg=26g/l
Anticilconz	4.5kg=1.5g/l
Leophen	12kg=4.5g/l

For feed (volume -3000ltr):

Caustic	90kg=30g/l
Anticilconz	6kg=2g/l
Leophen	21kg=7g/l

Box for Bottoming: (Volume-3000ltr)

Caustic	8g/l=24kg
Anticilconz	1.5g/l=4.5kg
Hostapol	4g/l=12kg
Black	5g/l=15kg
Reducing Agent	8g/l=24kg

Feed for Bottoming: (Volume-3000ltr)

Caustic	16g/l=48kg
Anticilconz	2g/l=6kg
Hostapol	7g/l=21kg
Black	10g/l=30kg
Reducing Agent	14g/l=42kg

Indigo Tank: (Volume-3400ltr)

Caustic	73.5g/l=250kg
Indigo	103g/l=350kg
Hydro	103g/l=350kg
Anticilconz	1.5g/l=5kg
Seatamol	4.12g/l=14kg
Permasian	5g/l=17kg

Shulpher Tank: (Volume-2000ltr)

Caustic	50g/l=100kg
Anticilconz	2g/l=4kg
Hostapol	12g/l=24kg
Black	350g/l=700kg
Reducing Agent	30g/l=60kg

Softener Tank: (Volume-600ltr)

Belfasin	70g/l=70kg
Acid	7g/l=7kg

Caustic Tank: (Volume-600ltr)

Single Caustic	125g/l=75kg
Double Caustic	250g/l=150kg

Hydro Tank: (Volume-200ltr)

Hydro	150g/l=30kg
Anticilconz	0.15g/l=300gm
Seatamol	4g/l=800gm
Permasian	5g/l=1kg

4.12 Process control of rope dyeing

- **Concentration of hydrosulphite**:

Relatively high concentration of hydrosulphite gives clear shades with minimum reddish streaks. The indigo dye stuff in the dye bath should be kept in soluble stage. Indigo dye has a tendency to react with the oxygen in the air and get oxidized and transferred into their original insoluble stage. Hence an extra quantity of hydrosulphite is maintained in the dye bath to keep the indigo dyestuff in soluble stage.

- **Caustic soda or pH value:**

The pH of the dye bath should be around 10.5 - 11.5. At higher pH, dye penetration is less and leads to poor wash down effect.

The pH influences the shades in the following way:
High pH or Caustic Concentration --> Redder and lighter
Low pH or caustic concentration --> greener and darker

❖ Dye concentration in dye bath:

Dye concentration is an important parameter in indigo dyeing. Generally the concentration of dye influences the shades as below:

High Indigo Concentration --> Shade is greener and lighter.
Low Indigo Concentration --> Shade is dull and Red.

❖ Dipping time:

The dipping time of the ropes in the dye bath plays an important role in indigo dyeing. Dipping time varies from 15-22 seconds. Longer the dipping time, better will be the penetration.

❖ Squeeze pressure:

The squeezing pressure should be optimum. High squeezing pressure may leads to low pick up of color and better penetration. At rope dyeing, squeeze pressure may be between 5-10 tones. Squeeze roller hardness should be about 70-75 deg. shores.

❖ Airing time:

Airing time is an important consideration in rope dyeing for proper oxidation. The airing time should be 60-75 seconds. Longer airing time leads to high oxidation whereas low airing time leads to poor oxidation.

❖ Drying:

The dyed and washed rope should be properly dried with proper moister content.

❖ Addition of chemical:

In indigo dyeing, the addition of chemicals is as below in order to achieve required depth of shades:

- Red Tinge: reduce addition of NaOH, increase slightly Na2S2O3
- Darkish Red: increase Hydro
- Light Greenish: decrease Hydro Dark Green: Increase Caustic.

❖ Dyeing speed:

High speed = high dyestuff exchange
Low speed = low dyestuff exchange

4.13. Stock tank of down floor (Denim 1):

- Three Bottoming tank
- One mercerization tank

4.13.1 Black stock tank and their concentration (Denim 1):

Tank	concentration
Tank(1,3)	28/350
Tank5	75/600
Tank6	30/240
Tank(2,4,7,8)	150/1200

4.13.2 Above the floor various tank and there volume (Denim 1):

Tank No.	Volume
Mercerization tank	3000ltr
Mercerization	3000ltr
Indigo preparation tank	3400ltr
Indigo tank	2000ltr
Indigo tank	2000ltr
Hydro tank	200ltr
Hydro tank	200ltr
Caustic	600ltr
Caustic	600ltr
Acid/salt	1500ltr
Acid/salt	1500ltr
Sulpher	2000ltr
Sulpher	2000ltr
Softener	1000ltr
Softener	1000ltr
Reducing tank	600ltr

4.14 Name of Chemical, Supplier, and Origin are used in Envoy Textiles Ltd:

Sl.No	Chemical Names	Supplier names	Origin	
1	Sulphol Black-B-Liq(250kgs)	Bhanu dyes pvt.ltd	India	Color
2	Diresul Black RDT-d Liq.BA(130kgs)	Clariant	Spain	Color
3	Belfasian G.T(720)	Pulcara	Turtey	Softener
4	Eulysin S	Basf	Germany	Acid
5	Hydrosulphite(100kgs)	Basf	Germany	Reducing Agent
6	Reducing Agent(50kgs)	Clariant	Indonesia	Reducing Agent
7	Anticilconz-1	Eksoy chemical co.	Turkey	Sequesterin g Agent
8	Indigo Grain(25kgs)	Wonderful	China	Color
9	Indigo Granular(20kgs)	Liyang Skyblue	China	Color
10	Indigo Liq	Dyestar chemical	Germany	Color
11	Seatamol Ws	Basf	Germany	Dispersing Agent
12	Caustic Soda(25kgs)	Xjin jiang group	China	Caustic
13	Caustic Soda(25kgs)	Henan kingdom chem.co	China	Caustic
14	Parmagen NFS	Bangpoo chem..	Thailand	Wetting Agent
15	Leophen m/c	Basf	Germany	Wetting Agent
16	Hostapol EH Liq	Clariant	Pakistan	Wetting Agent
17	Edunine XL-NT	Croda Chemical	India	Fixing Agent
18	Diresul Activant N Liq	Clariant	Spain	Color
19	Diresul brown RDT-GS-Liq	Clariant	Spain	Color
20	Indosol E-50-Liq	Clariant	Mexico	Color
21	Diresul Brilliant Green RDT-H-Liq	Clariant	Spain	Color
22	Diresul Red RDT-BG-Liq(65kgs)	Clariant	Spain	Colour
23	Diresul Yellow RDT-E Liq	Clariant	Spain	Colour
24	Diresul Indinavy RDT-B Liq	Clariant(Archroma)	Spain	Colour
25	Direfix SD Liq	Clariant	Switzerland	Fixing Agent
26	Overwax De	Lamberti Asia pacific	EU	Softener

4.15 Chemical Name & Function:

Chemical Name	Function
Wetting Agent	It emulsifies the waxes in the grey cotton and to ensure the satisfactory penetration of dye liquor into the substrate.
Sequestering Agent	Used to remove the hardness of water, makes the water soft.
Dispersing Agent	Used to resist the aggregation of Indigo dyes.
Reducing Agents	Indigo dyes are not soluble in water. Sodium Hydrosulphite is used to reduce the indigo converted at leuco-form.
Softener	Removes fat and wax by the action of soapanification.
Caustic Soda	Mercerize the cotton fibre as a result the amorphous region is converted to crystalline region, so the luster and absorbency of cotton is increased.

4.16 Calculation of Dyeing process:

Calculation of Wt of sample:

Here, No. of Rope=36

M/c speed=28rpm

No. of ends per Rope=370

Count=9Ne

Weight of sample kg/min=?

Wt of sample= (No. of rope X m/c speed X No. of endsX453.6) ÷ (countX840X1000X0.9144)

= (36X28X370X453.6) ÷ (9X840X1000X0.9144)

=24.47kg/min

2. Required dye dosing for 3.35% shade of Indigo:

Required dye= (shade% sample Wt) ÷1000X100

=3.35X24.47÷1000X100 =8.1

3. Calculation of Shade %:

Here, feed=2.5ltr

g/l of mother solution=100

Production=19.65kg

Shade%=?

Shade%= (feed/min in liter X gpl of mother soln) ÷ (production /minX1000) X100

= (2.5X100) ÷ (19.65X1000) X100

=1.27%

3. Pick up %:

Indigo→ Dry to Wet pick up%=60%

Wet to Wet pick up %=25-30%

Black → Wet to Wet pick up %=15-20%

Chapter: 05

Long Chain Beam

5. L.C.B (Long Chain Beam) Section:

After the rope dyeing of warp yarn in denim production, the next operation is the Long Chain Beam (LCB). When the rope has been dyed and dried in the rope dyeing range, it is taken in large cans in coiler section .The basic purpose of long chain beamer is to open the rope into a sheet form of yarn and wind onto a warper beam which in turn transferred to the sizing machine. In Long Chain Beamer, the yarn alignment in the dyed rope is change from a rope form to a sheet form.

5.1 Machine Description: (Denim:1 and Denim:2)

T.M/c	Manufacturer	Speed	Tension	Origin
08	GRIFFIN	250pm	Auto tension	U.S.A
02	MORRISON	250rpm	Auto tension	U.S.A
12	KARL MAYER	250pm	Auto tension	Germany

5.1.1 Machine Parts:

- Head stoke
- Beam
- CP rod
- Counting roller
- Reed
- Scrumer
- Lifter
- Foot paddle
- Dancer
- Pressure roller
- Tension roller
- Guide roller
- Eco monitor

5.1.2 Machine speed and Tension according to the different count:

For GRIFFIN and KARL MAYER M/c:

Count	Tension	Speed(rpm)
6Ne(OE&Slub)	80-85 g/e	180-200
7Ne(OE&Slub)	75-80g/e	200-250
9,10Ne(OE&Slub)	68-73g/e	200-250
12Ne(OE&Slub)	60-65g/e	200-250
16Count	50-55g/e	160-200
20Count	45-50g/e	150-170

For MORRISON M/c:

Count	Tension	Speed(rpm)
6Ne(OE&Slub)	33-38 g/e	160-180
7Ne(OE&Slub)	30-35g/e	200-250
9,10Ne(OE&Slub)	23-28g/e	200-250
12Ne(OE&Slub)	20-25g/e	200-250
16Count	17-22g/e	160-200
20Count	15-20g/e	150-170

5.2 Different Unit Image of L C B Machine:

Fig:Head Stoke

Fig:Eco Monitor

Fig: Tension Stand

Fig: L C B Floor

5.3 Faults are seen in LCB Section:

- Length variation
- Weak yarn
- Weak splice
- Rope crossing
- Lapper Cut
- Bunch
- Ball formation
- Sticky
- Miss Ends Slub opening

5.4 Calculation:

Here, Length=28801m
Total breaks=80
No. of Ends/rope=370
Breakage percentage=?

Breakage% of 1000m = (total breaks X1000) ÷Total length
=80 X1000÷28801
=2.7%

And Breakage% of 1000000 = (total breaks X1000000) ÷ (Total length X Ends No.)
= (80 X1000000) ÷ (28801 =7.5%

Chapter: 06

SIZING

6. SIZING SECTION:

6.1 Definition of Sizing:

The process of applying a protective adhesive coating on the yarn surface of yarn surface of yarn is sizing. This is the most important operation to attain maximum weaving efficiency. Especially for blended and filament yarn. Sizing increase elasticity of yarn, yarn strength, weight of yarn, smoothness, frictional resistance. Sizing consists of impregnating the yarn with particular things which form on the yarn surface a film with the aim of improving yarn smoothness and tenacity during the sub sequence weaving stage. Thanks to its improved tenacity and elasticity, the yarn can stand without problem the tension and rubbing caused by weaving.

6.1.1 Objectives of sizing:

- To increase the strength of yarn.
- To increase the smoothness of yarn.
- To increase the abrasion resistance of yarn.
- To increase the elasticity of yarn.
- To improve the weave ability of warp yarn.
- To remove the hairy fibers from the fabric surface.

6.2 Machine description :(Both Denim 1 and Denim 2 floor).

Sl.No	Manufacturer	Speed	Creel Capacity	Origin
1	GRIFFIN	80	16	USA
2	UKIL	80	12	UK
3	UKIL	80	16	UK
4	UKIL	80	12	UK

6.2.1 Machine parts:

- Beam
- Head stoke
- CP rod
- Counting roller
- Reed
- Lifter
- Lease rod
- Lease stand
- Lease tension rod
- Moisture roller
- Dry cylinder
- Size Box
- Creel

- Creel stand

There are two types of sizing are done-

1. Surface Coating
2. Inter-Surface Coating

Surface Coating: Surface coating sizing is done for 6-12Ne count of yarn and "Quick solan" chemicals are not use in this process.

Inter-Surface Coating : Inter surface coating sizing process is applied for only 12-upto 30Ne count of yarn and "Quick solan" chemicals are use in this process.

6.3 Sizing Faults:

- Yarn breaks
- Weak yarn
- Weak splice
- Loose yarn
- Lapper
- Ball formation

6.4 Chemicals are use in sizing section:

1. Starch→ Modified starch-Sizetex
   Kollotex-5
   Kollotex-750
2. Acrylic binder→Temsize-200
3. Softener→ Wax
4. Quick solan SPR

6.5 Form of chemical and obtained water percentage:

Chemical	Form	% of water
Starch	Powder form	5%
Temsize	Liquid form	75%
Wax	Capsule form	95.5%
Quick solan SPR	Powder form	5%

6.6 Required amount of Refraction value against of Viscosity value:

Viscosity value	Refraction value
9%	(20-25)%
8%	(18-22)%
12%	(26-30)%

6.7 Pick up%:

This is defined as the amount of size that carried by the warp yarn during sizing operation and is expressed as the % of the warp yarn. Pick up% is also known as take up % or simply size%.

$$\text{Pick up \%} = \frac{\text{Weight of size yarn- weight of unsize yarn}}{\text{Weight of unsize yarn}}$$

Starch: it is occurring film former on the yarn. It is also called adhesive. it is two types

1. Natural starch
2. Synthetic starch

Natural starch: natural starches are generally made from potato, maize, wheat, corn, sago. Those are native starch.

Synthetic starch:

Synthetic starches are made from different chemical composition. Those are modified and highly modified. Some modified starches are

Name	Country	Brand	Viscosity	Solid%
Sizetex	Singapore	Aveve	High modified	90-95
KOLOTEX	Holland	Aveda	Medium modified	90-96
SPR	Holland	Aveve	High modified	90-95

Function:

To make coating on the yarn
To improved yarn strength
To increase smoothness
To increase elasticity and stiffness

Softener: it is another essential ingredient of size solution preparation.
Function:

- To make the yarn soft and slippery
- To smoothen the yarn and
- To reduce stiffness

6.8 Refraction value: Refraction value means the solid percentage in liquor.

- Refraction value measured by Refraction Meter.
- And Viscosity value measured by Viscosity Cup

6.9 Image of Different Machine Parts:

Fig: Creel Section

Fig: Chemical Box

Fig: Lease Rod

6.10 Running program and this setting parameter:

Programme No. =1001/11872
Set length=11000mtr
Count=16Oe
Total Ends=4888
Style =Re-120-A

Chemical Recipe:

Sizetex-5	100kg
Kollotex-5	50kg
Temsize	16kg
Wax	03kg
Water	1250ltr

Tension:

Creel Tension	26g/e
Lease Tension	42g/e
Beam Tension	51g/e

Temperature:

Coocking temp	88◦c
Reserve tank temp	85◦c
Size Box(1,2) temp	85◦c
Dry cylinder temp(zone 1,2,3)	(110,110,105)◦c
Moisture	6.0%

6.11 Calculation:

Measure the Refraction value:

Here, solid=100kg

Condense%=14%

Total liquor=1600ltr

Refraction % = (solid X14%) ÷total liquor X100

= (100 -14) ÷ (1600 X100) X100

=5.38%

And **Weight of Unsized yarn:**

Here, Length=40inch

Count=16Ne

Total ends=4888

Weight= (40 X4888) ÷ (39.37 X16 X1.6933)

=183.3gm

Calculation of size Take-up percentage:

Here, The size yarn weight=206gm
The unsized yarn weight=183gm
Take-up percentage = (size yarn weight - unsized yarn weight) ÷ unsized yarn weight X100
= (206 -183) ÷183 X100 =12.6%

Chapter: 07

Weaving

7. Weaving Section:

7.1 Weaving:

Interlacement of the ends and picks with each other which produces a coherent structure. The repeating pattern of interlacing is called weave. Weaving is the interlacing of two or more threads or pieces of material in order to create a joined structure. While it is most often used to make cloth, the technique is also common in other crafts such as basket making.

Weaving is the process of making cloth, rugs, blankets, and other products by crossing two sets of threads over and under each other. Weavers use threads spun from natural fibres like cotton, silk, and wool and synthetic fibers such as nylon. But thin, narrow strips of almost any flexible material can be woven. People learned to weave thousands of years ago using natural grasses, leafstalks, palm leaves, and thin strips of wood.

Weaving is the textile art in which two distinct sets of yarns or threads, called the warp and the filling or weft (older woof), are interlaced with each other to form a fabric or cloth. The warp threads run lengthways of the piece of cloth, and the weft runs across from side to side.

7.1.1 Air jet weaving machines:

The air jet weaving machines are the weaving machines with the highest weft insertion performance and are considered as the most productive in the manufacturing of light to medium weight fabrics, preferably made of cotton and certain man-made fibres (sheets, shirting fabrics, linings, taffetas and satins in staple yarns of man-made fibres); it has anyway to be pointed out that technically positive results are obtained at present also with heavy weight fabrics (denims) and that some manufacturers produce also machine models for terry production. These machines are the ideal solution for those who want to produce bulk quantities of customized fabric styles.

Main parts of air jet machine:

- Main motor
- Controlling penal
- Let of roller
- Take of roller
- EDP
- Sley
- Reed
- Cam box

7.1.2 Rapier weaving machines

The rapier weaving machines are the most flexible machines on the market. Their application range covers a wide variety of fabric styles. Their present weaving speed of about 600-700 strokes/min is the result of the use of a state-of-the-art construction technique, characterized by the use of gear sets without plays and by minimum vibrations of the reed, the sley and the heald frames.

7.2 Machine Description: For Denim: 1

Total M/c	Manufacturer	Maximum speed	Origin	Model
19	PICANOL Rapier	650rpm	BELGIUM	Optimax
01	PICANOL Air jet	1050 rpm	BELGIUM	Optimax
112	TSUDAKOMA Air jet	1000rpm	JAPAN	ZAX9100

For Denim: 2

Total M/c	Manufacturer	Maximum speed	Origin	Model
142	PICANOL Airjet	1050rpm	BELGIUM	OMNIplus Summum
10	Shuttle loom (Shan Dong Lija)	185rpm	CHINA	

7.2.1 Machine parts:

- Creel
- Creel stand
- IRO or P winder
- PFT
- Fixed nozzle
- Move level
- Tample and Tample rubber
- Cutter
- Relay nozzle
- Elsy plus
- Heald frame
- Heald eye
- Cam box
- Dropper
- Contact bar
- Pannel board
- Warp beam
- FD(Film Director)
- Profile float
- Wastage wheel
- Weavers beam
- Reed

7.3 MOTION:

1. Primary motion:
    a. Shedding
    b. Picking.
    c. Beating.
2. Auxiliary motion:
    a. Let-off.
    b. Take-up.
3. Tertiary motion:
    a. Brake.
    b. Warp stop motion.
    c. Weft stops motion.

SHEDDING:

The function of shedding mechanism is to raise and lower the heald frames which carry the warp ends, to make an opening for the weft yarn to pass through and to change the position of warp threads after each pick so that weft yarns will warp and be interlaced as per weave/design.

PICKING:

Picking means inserting a weft thread across the warp through the shed during weaving. After the shedding mechanism opens the warp threads to form a shed, the picking motion comes into play to insert a weft thread across the warp through the shed.

Beating:

It is where the reed pushes the weft into the fell of the cloth to form fabric. This requires considerable called beating up.

The above mentioned three primary motions of a loom i.e. shedding, picking, beating is performed in a cyclic order and the fabric is produced. Then the fabric is passed over the front rail and wound of the cloth roller

Weft stops motion:

The object of the weft stop motion is to stop the loom when a weft thread breaks or gets exhausted. This motion helps to avoid cracks in a fabric.

Warp stop motion:

The object of the warp stop motion is to stop the loom immediately when a warp thread breaks during the weaving process.

Brake:

The brake stops the loom immediately whenever required. The weaver uses it to stop the loom to repair broken ends and picks.

7.4 Different Machine Parts of Loom:

Fig:P-Winder

Fig: Denting

Fig: knotting Machine

Fig: Cam Box

7.5 Machine Indicator Light:

► Green light : Normal Stop

►Yellow Light: Weft Stop

► Red Light: Warp Stop

► White Light: Technical Problem

► Red + Yellow Light: Warp + Weft Stop

► Green + Red Light : Selvedge + Wastage Stop

► Green + Yellow Light: Bobbin Breakage

7.6 Types of reed are use:

1. DM(Dent Meter) reed
2. Count reed

DM reeds are:

Reed Count		Reed Size
Reed	650	190 cm
Reed	541	190 cm
Reed	650	220 cm
Reed	620	220 cm
Reed	925	(4)-220 cm
Reed	925	220 cm
Reed	925	190 cm
Reed	748	220 cm
Reed	748	(4)-220 cm
Reed	984	190 cm
Reed	1024	220 cm
Reed	866	(4)-220 cm
Reed	722	(4)-190 cm
Reed	748	190 cm
Reed	620	190 cm

7.7 Specification of Loom production:

Buyer	Style	Weave	Construction
Serkin	S-215A	2/1 R.H.T	(7,9,12)X12oe/66X46
V.F.Asia	Re-97	2/1L.H.T	16oeX16oe/71X36
Disari	SL-95	2/1 R.H.T	(16Rsl+16oe)X16oe/71X43
Sogut	RE-120A	"	16oeX16oe/71X43
Epic	RE-103E	"	10oeX12oe/71X42
Join	3105	"	10combX150DN/92X64
Tomtailor	3104	"	20combX20r/92X54
Rezaul	RE-118	"	30combX30comb/106X60
Julfikar	RE-128	"	30combX32comb/106X54
S.R Fabric	416543	4/1 Satin	32/2RX16L40D/90X65
Diana	34267	"	16combX300L70D/88X64
Trouser	LY-266	3/1R.H.T	(16Rsl+16r)X16L40D/88X53
Titus	37387	"	(16Rsl+16)X150L70DBlk/84X61
Next	33175	"	(16Rsl+16R)X20RBlk/83X61
Muskan	3956	"	12RslX(450DN+12psl)/76X64
AKM knit	SL-125	"	(16Rsl+16oe)X16oe/75X54
Sumel App	RE-109	"	12oeX16oe/71X47
Sportframe	35645	"	12oeX16oe(indigo)/71X50
Tema	LY-12	"	(12Rsl+12oe)X16L40DN/71X54
Epic	S-219	"	(7oe+9oe+12oe)X9oe/66X50
Capri	4224	3/1B.T	(9Rsl+9oe)X(8Rsl+600DBlk)ES-08/66X53
Capri	4082	"	(9Rsl+9oe)X(8Rsl+600DBlk)ES-09/66X53
Cintas	RE-64N	3/R.H.T	7X7oe/66X41
Fashion	32374	"	(9Rsl+9oe)X16L40D/66X50
Jeans Care	324148	"	(9Rsl+9oe)X16L40D/66X50
Big-W	SL-152	"	(9Rsl+9)X300DN/66X52
Regency	3828	"	(7oe+10oe)X(9oel+8oe)/66X44
Epic	3462	3/1 B.T	(6oe+9oe)X7oe/57X38
Epoch	M-98	3/1 R.H.T	(7,9,12)X9oe/66X45
Wallmart	3434E	3/1B.T	(7oe+9oesl)X7oe/55X38

7.8 Weft yarn supplier name:

- Square
- ES-35
- A.A
- Badsha
- Arif
- BK
- Delta
- D-19
- F.dy
- A.F
- Bright Black

7.9 Weaving faults are seen in Fabric:

- Double Ends
- Snarl
- Wrong Denting
- Broken picks
- Starting Mark
- Wrong Drawing
- Loose or tight yarn
- Miss picks
- Double picks

7.10 Types of Selvedge:

1. Matt Selvedge
2. Leno "

Heald frame used in various weave plan :(For Cam setting)

1. Weave 2/1 ,No. of heald frame required=4
2. Weave 3/1 ,No. of heald frame required=6
3. Weave 4/1 ,No. of heald frame required=7

7.11 Calculation:

1. CMPX→Centi Million picks. Here, Total Stops=5

Total picks=5, 00000

CMPX= (T. Stop X1000000) ÷ T. Picks

= (5 X10, 00000) ÷5, 00000

=10%

2. Production calculation:

Here, rpm=650

PPI=41

Efficiency =80%

Production per shift in meter=?

Production per shift in meter= (rpm X 60 X8X80) ÷ (PPI X36X1.0936 X100)

= (650X60X8X80) ÷ (41X36X1.0936X100)

=155mtr/shift

Chapter: 08

Finishing

8. Finishing Section:

8.1 Definition:

In general, before marketing, all the process which are applied on the fabric after weaving is called finishing. In short sense, finishing is the process by which the fibers, yarns and fabrics are made as presentable to the customer and these processes are implemented after coloration. The term finishing covers all those treatments that serve to impart to the textile the desired end-use properties.

8.1.1 Objects of Finishing:

- To increase the attractiveness of fabric.
- To increase the service ability.
- To increase the beauty and glitter rinses of fabric.
- To increase the fineness and to ensure smoothness.
- To ensure the softness of the fabric.
- To free from hairiness of the fabric.

8.2 Types of finishing:

Physical/Mechanical Finishing:
The finishing process which is performed by machines but not using of chemicals is called physical/mechanical finishing.
Example: Calendaring, embossing, raising, sanforizing etc.

Chemical Finishing:
The finishing process which is performed by application of chemicals which reacts with fibres is termed as chemical finishing.
Example: Starching, Mercerizing, resin finishing, Desizing, Water Repellent Treatment, Flame Retardant Treatment, etc.

8.3 The following types of finishes are applied to the denim fabric at Envoy Textiles Ltd.

- ✓ Singeing
- ✓ Softening
- ✓ Skew control
- ✓ Sanforizing
- ✓ Calendaring
- ✓ Desizing
- ✓ Mercerizing
- ✓ Resin finishing

8.4 Machine Description: For Denim: 1

Sl.No.	Manufacturer	Speed	Origin
1	MORRISON	80 m/m	U.S.A
2	KYOTO	60 m/m	JAPAN
3	STENTER	60 m/m	INDIA

For Denim:2

Sl.No.	Manufacturer	Speed	Origin
1	RED FLAG	70 m/m	CHINA
2	SMARTTEC	70 m/m	CHINA

8.4.1 Process flowchart of different Finishing M/c:

Morrison Finishing m/c:	Kyoto Flat Finishing M/c:	Stenter finishing m/c:	Red Flag finishing m/c:	Smarttec finishing M/c:
Grey Fabric ↓ J-Box ↓ Brushing ↓ Singing/ Burner ↓ Chemical Box/Softener ↓ Padder Roller ↓ Skew Roller ↓ Drying Cylinder ↓ Moisture ↓ Rubber Belt ↓ Palmer Unit(Calendaring unit) ↓ Folding	Grey Fabric ↓ J-Box ↓ Brusher Roller ↓ Singing /Burner ↓ Caustic Box ↓ Padder Roller ↓ Stenter Chain ↓ Wash Box (5) ↓ Softener Box ↓ Skew/Bango roller ↓ Padder Roller ↓ Drying Cylinder ↓ Air cooler ↓ Rubber Belt ↓ Palmer Unit(Calendaring unit) ↓ Folder	Weaving-Grey Fabric ↓ J-Box ↓ Chemical Box ↓ Padder Roller ↓ Skew Roller ↓ Coating ↓ Infeed Device ↓ Stenter Chain ↓ Heat Setting ↓ Blower Fan ↓ Cooling Chamber ↓ Folder	Patcher ↓ J-Box ↓ Wash box ↓ Padder ↓ Over dyeing Box ↓ Steamer Box ↓ Wash Box(8) Folder ↓ Softener Box ↓ Skew roller ↓ Dry can(3 unit =30) ↓ Moisture meter ↓ J-Box ↓ Fabric feeding roller ↓ Moisture roller ↓ Rubber Belt ↓ Palmer unit ↓ Cooling ↓ Folder	Patcher ↓ J-Box ↓ Caustic Box ↓ Padder ↓ Wash Box ↓ Chain ↓ Padder roller ↓ Wash Box ↓ Chemical Box ↓ Skew ↓ Dry Can ↓ J-Box ↓ Brusher ↓ Folder

Singeing:

The fabric is singed in both or only face side which burn off the protruding fibers from the fabric surface. Normally denim fabric is singed twice in a single passage of a singeing machine. The denim finished fabric must have soft and pleasant handle.

Singing parameters

- Fabric speed (m/min)
- Flame intensity (mbar)
- Fabric temperature (°C)
- Singeing positions
- Burner fabric distance (mm)

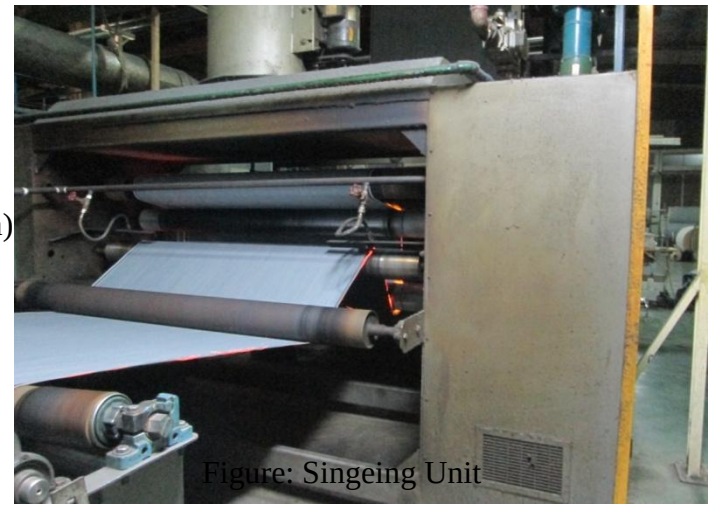


Figure: Singeing Unit

Sanforizing

The sole objective of sanforizing is to control the length wise shrinkage of fabric. The maximum percentage of shrinkage depends on fabric construction and quality but controlled according to the customer specifications. The process is a purely mechanical treatment without any addition of chemicals. The Sanforized label means dimensional stability for garments made up of Sanforized labeled fabrics. The purpose of the process is to shrink fabrics in such a way that textiles made up of these fabrics do not shrink during washing. The amount of potential wash shrinkage must be determined prior to shrinking.

There are 4 variables that are critical for shrinkage, fabric defects and elongation:

1. Temperature
2. Moisture
3. Quantity of pressure
4. Time of pressure

Figure: Sanforising Unit

Stenter

The stenter is a gas fired oven, with the fabric passing through on a chain drive, held in place by either clips or pins. Air is circulated above and below the fabric, before being exhausted to atmosphere. As well as for drying processes, the stenter is used for pulling fabric to width, chemical finishing and heat setting and curing. It is a very versatile piece of equipment.

Mercerization:

Mercerization is a physio-chemical process where yarn (cotton) is treated with 15-25% caustic soda solution at a temperature of 200-300C. It is necessary to hold the fabric under tension and wash thoroughly.

Advantages of mercerization:

- Increase tensile strength
- Improve hygroscopicity
- Improve dye affinity
- Improve smoothness
- Improve luster
- Improve dimensional stability and physical compactness
- 20-30% dye and chemical save while dyeing after mercerization.

Desizing:

Desizing is the process of removing size materials from fabric. This is done simply passing the fabric through some hot water bath for several times. Sometimes softener can be used for better removing of size materials and also for better soft hand feeling.

Fig: Chemical Box

Fig: Palmer Unit

8.5 Finishing Chemical Report:

Chemical	Finish
Permasoft	Wet Finish
Hostapol-EH	
Eulysian Acid	
Caustic Soda	Mercerize Finish
Bactasol	
Hostapol xtra	
Mercerol	
Solosoft	
Salt	
Karialon.XC.J.Con	Over dyeing and Tinting Finish
Binder.Tow	
BinderCFF	
Primasol.level.V	
Vitaxol.PFA	
Black Colour	
Siligen.Sie	
Green Colour	
Golden Yellow	
Colour Fixing	
Brown Colour	
Rolflex/Resin.Bz-78	
Rolflex/Resin.BK-8	

Binder .PAN-60/Thicker	Coating Finish
Binder	
Black(Pigment)	
Lorapret DPS	PU Finish
Lava Fix FF	Fixing Agent
Lamfinish FAT	Sample Chemical
Lamfinish LUC	
“ PCL	
Rolflex ALG	

8.6 Setting parameter for wet Finish:

Temperature	
palmer	140-150◦c
Rubber belt	125◦c
Dry can	1-2.5 bar
Chemical box	30-40◦c
Pressure	
Palmer	3-3.5 bar
Rubber belt	2.5-3.5 bar
Padder roller	3 bar

Chemical Recipe: (Volume-1000ltr)

Parma soft	10g/l=10kgs
Hostapol.EH	1g/l=1kg
Eulysian Acid	2g/l=2kg

8.7 Setting parameter for Mercerize and De-Size Finish:

Temperature	
palmer	140-150◦c
Rubber belt	125◦c
Dry can	.8-1 bar
Wash Box	50-70◦c
Chemical box	30◦c
Caustic Box	30-40◦c
Pressure	
Palmer	4.5-8 bar
Rubber Belt	15-17 bar
Padder roller	2.5-4bar

Chemical Recipe: Mercerize (Volume-1000ltr)

Caustic	175 g/l
Mercerol	3g/l
Solosoft	3kg
Acid	10-12kg

Chemical Recipe For De-Size: (Volume1000ltr)

Bactasol	30kg
Hostapol Xtra	30kg
Salt	2kg

Chapter: 09

Inspection

9. Inspection Section:

9.1 Inspection in Envoy Textiles:

Quality is ultimate concern; every single yard of the denim goes through inspection department and rated by a point count system to ensure that quality is up to standard before packing. Defective fabric pieces are rejected and sold as seconds and relatively minor defective points are marked clearly using stickers to alert cutters.

Flow chart:

Inspection
↓
Melding
↓
Line chick
↓
Recheck
↓
Folding
↓
Ready for delivery

9.2 Inspection Process:

Fabric batcher is set at the back side of machine equipped with rollers which provides fabric unwinding. Inspection table is laminated white to enhance the defect identification. Four tube lights are provided to optimize the lighting. Measuring counter is provided in front of the inspection table for controlling length. It has forward, reverse, start and stop button controls. Inspection is carried out on white board table. The cloth is pulled over the white board table by a variable speed motor and different cloth defects are recorded for quality control purpose. They inspect the fabric according to 4 point system. After inspection fabric is wound on roller.

Figure: Inspection Section

9.3 Fabric Defects Code:

Yarn		Dyeing		Sizing		Weaving		Finishing	
Types of Defect	Code no.	Types of Defect	Code no.	Types of Defect	Code no.	Types of Defect	Code no.	Types of Defect	Code no.
Coarser warp	101	Shade variation	201	Loose	301	Broken pick	401	Crease mark	501
Coarser weft	102	Undyed	203	Tight	302	Double pick	402	Unsigned	502
Finer warp	103	Centre Selvedge shade variation	204	Beam satin	303	Missing pick	403	Width variation	503
Finer weft	104	Dyeing bands	205	Size patch	304	Lashing pick	404	Machine stop	504
Oily warp	105			Less width	305	Starting mark	405	Hole	505
Oily weft	106			Slack End	306	Reed mark	406	Waviness	506
Slub	107			Ball formation	307	Knot	407	Finishing band	509
Contamination	108					Snarling	408	Oil spot	510
Thick/t	109					Bad	410	Chemical	511

hin		selvedge		spot	
Nip open	110	Double end	412		512
Wrapper fibres	111	Wrong Drawing	413		
Missing lycra	112	Less width	414		
Neps	113	Missing end	416		
		Tail end knot	417		
		Bent pick	418		
		Warp brushing	419		

9.4 Four point system:

This is issued by the American Society for Testing and Materials with reference to the designation: ASTM D5430-93.
Faults are scored with penalty points of 1, 2, 3 and 4 according to their size and significance.

Fault length	Penalty Point
0-3 inch	1 point
3-6 “	2 “
6-9 “	3 “
9-12 “	4 “

9.5 Calculation:

Find out the grad of fabric based on 4-point system
Solution:
2*1=1
5*2=10
1*3=3
1*4=4
Total=19point

Point/100 yds. = {(Total point scored in a roll *3600)/(Total yds. Inspected Fabric *widths in inch)} or
=19*3600/100*48
=13.13
Point/100 meter= total fault point*100*39.37/inspection fabric width*inspection meter
=16*100*39.37/48*100
=14.25
The fabric is “A” grade

Chapter: 10

LAB

10 LAB Section

10.1 Type of Testing In Lab

For Yarn	For Fabric
	GSM
Count	Fabric Width
Lea strength	Shrinkage
Single strength	Skew Movement
CSP test(actual count*lea strength)	Constriction
Twist per Inch	Spirality
Twist Multiplier	Tensile strength
Spandex(%)	Tear strength
Thin& thick place	Stretch
Neps Hairiness	Growth Fabric
Imperfection	PH
Slub diameter	Seam Slippage
Slub length	Color fastness to Wash
CV%	Color fastness to rubbing
Tenacity	

10.2 Machine, Equipment name and their Function& Image:

Fig:USTER TESTER 5

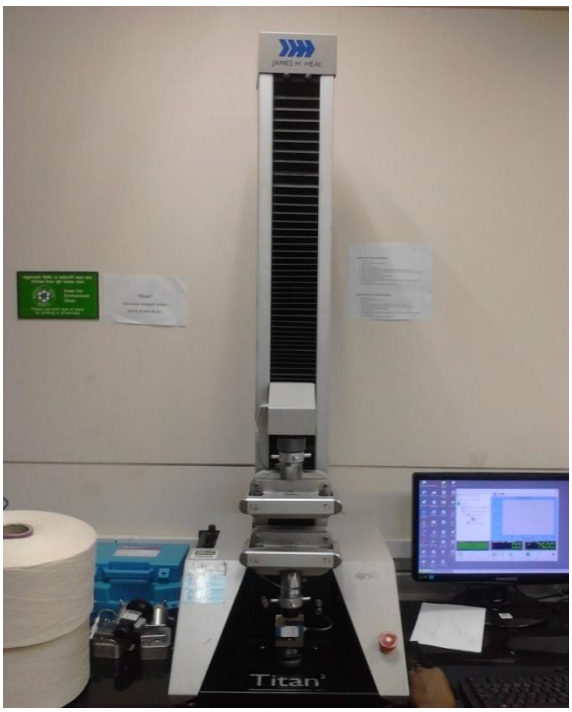


Fig:Titan2

Fig: Lea Strength Tester

Fig: Auto Warp Reel 10

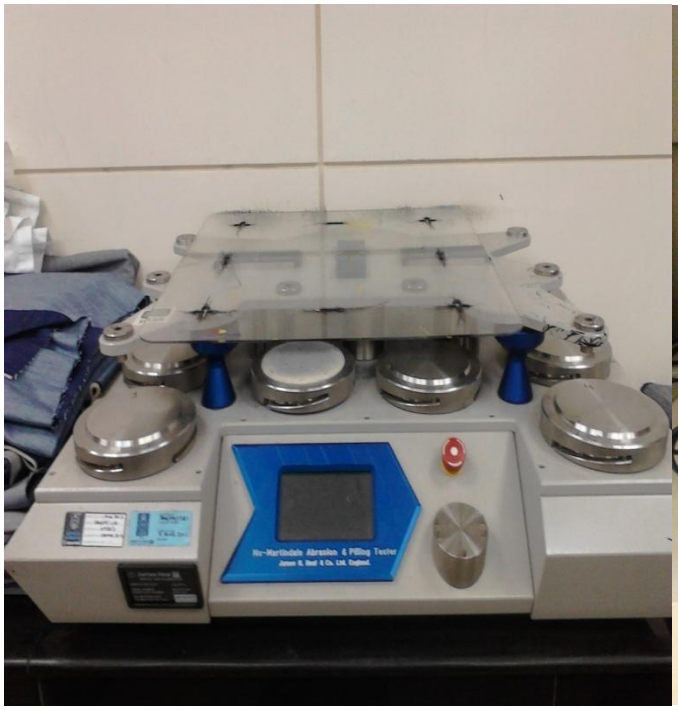


Fig: Nu-Martandal abrasion and pilling tester

Fig: Elmatear(Tear test)

Sl.No	: Machine Name	Manufacturer	Origin	Function
01	USTER TESTER 5	USTER	Switzerland	Used to determine the CV%, Thin& thick place, neps hairiness, imperfection, slub diameter, slub length etc.
02	Titan2	James H. Heal	England	Used to determine the Tensile strength, Elongation of yarn and fabric and it is used for determine seam slippage.
03	Lea Strength Tester	MAG Solvics	India	Used to determine the strength of lea.
04	Ele Twist Tester	MAG Solvics	India	Used to determine Twist per inch.
05	Auto Warp Reel 10	MAG Solvics		India Used to make lee for count and lea strength test.
06	Auto Warp W			
07	Elmatear(Tear test)	James H. Heal	England	Used to determine the tear strength of fabric
08	Verivide Light Box	Verivide Ltd	England	Used for shade matching
09	Nu-Martandal abrasion and pilling tester	James H. Heal	England	Used to check the abrasion and pilling resistance of fabric
10	GSM Cutter	James H. Heal and Co.	England	Used to check the GSM of fabric
11		SK SATO KEIRYOKI CO. LTD	Japan	Used to check lab temperature and relative humidity
12	Crock meter	James H. Heal and Co.	England	Used to check the color fastness to rubbing
13	Humidifier	STULZ	U S A	Used to Control temperature and humidity

Chapter: 11

Research and Development (R&D)

11 Research & Development (R&D)

11.1 R & D Department in Envoy Textiles:

Research & Product development department is an important department for any textile industry.This plays a direct role on developing a product.

Envoy Textiles Ltd. has also a Research & Development (R&D) department with modern amenities which correlates very well with the upcoming new product. Continuous research programmed is carried-on here, which is completed by product development. The R&D department is independent and equipped to promptly invent new designs for new fashion and develop buyer's requirements timely. This department keeps all documents from dyeing recipe to fabric construction and keeps master roll to keep shade in same consistent even over a longer discontinuity. Envoy denim always researches to develop new fashion as per the world requirement as well as to maintain comfort & durability.

Most often this department creates new product on the basis of new design & structure by their own creativity according to the current market demand and then give it to the buyer. If this design is approved by the buyer then it is stored.

When an order comes from buyer in form of washed sample. The technical person determines the shade percentage, amount and type of washing to that fabric to get the appearance like the sample. So it is very important to wash the sample fabric to justify his assumption. For this purpose a small washing unit is established in the factory.

Every order firstly comes into R&D department via marketing peoples by mail or swatch. The R&D experts analyze these samples and match it with their developed samples. If they find similar samples then this is sent to buyers for approve. If buyers approve it then the R&D section goes for production.

11.2 Developed Samples:

Samples according to Weave	**3/1 (both RHT & LHT)** **2/1 (both RHT & LHT)** **2/2 RHT** **3/2 RHT** **4/1Satin** **1/1 chambray** **Broken Twill**
Samples according to Count	Regular – OE & Ring Slub Slub Slub Poly Stretch Cross Slub Stretch Denim Polyester Denim
Samples according to Weight	4.5Oz/Yd2 to 15.75 Oz/Yd2 Light weight: 4.5 Oz/Yd2 Medium weight: 7.5 Oz/Yd2 Heavy weight: 15.75 Oz/Yd2
Samples according to Color	Indigo Special Indigo Dark Indigo Blue Black Black Bottoming Topping
Samples according to Finish	Flat Finish Wet finish Mercerize finish De-Size finish Stenter finish
Samples according to Wash	Rinse wash Enzyme wash Enzyme Bleach Neutralization of Bleach: Enzyme Stone Enzyme Stone Bleach

11.3 Types of Hunger & Design Develop by R&D Department at Envoy Textile Ltd:

11.4 Denim Washing in Envoy Textiles:

When an order comes from buyer in form of washed sample the technical person determine the shade percentage, amount and type of washing to that fabric to get the appearance like the sample. So it is very important to wash the sample fabric to justify his assumption.

Envoy Textiles denim only gives washed sample receipe so that buyer can get his desired design but does not run mass production.

11.5 R&D Department they are flow 6 washing process:

1. Rinse wash
2. Enzyme wash
3. Enzyme Bleach
4. Neutralization of Bleach:
5. Enzyme Stone
6. Enzyme Stone Bleach

11.6 washing recipe for different washing: For 2 kg fabric

1. Rinse wash:

Water	100 L
Temperature	60O C
De-sizing Chemical	100 gm
Time	8-10 minute
for each shade wash two time (cold wash)	

2. **Enzyme wash :** This wash is done after completing enzyme Rinse wash

Water	80 L
Temperature	45-50O C
Enzyme Chemical	120 gm
Time	25-30 minute
PH	5-5.5
for each shade wash two time (cold wash)	

3. Enzyme Bleach wash :

Water	100 L
Temperature	60O C
Bleaching powder Chemical	500 gm
Time	5-7minute
for each shade wash two time (cold wash)	

4. Neutralization of Bleach:

Water	80 L
Temperature	50-60O C
Chemical(H202)	500 gm

Time	5minute
for each shade wash two time (cold wash)	

5. Enzyme Stone:

Water	100 L
Temperature	45C
Enzyme Chemical	150 gm
Stone	3kg
Time	30-40 minute
PH	5-5.5
for each shade wash two time (cold wash)	

6. **Enzyme Stone Bleach:** It is done after completing enzyme stone wash

Water	100 L
Temperature	50-60O C
Bleaching chemical	500 gm
Time	5-7minute
for each shade wash two time (cold wash)	

Chapter: 12

Utility

12. ETP in Envoy Textiles Ltd:

Effluent Treatment Plant (ETP) of Envoy Textiles Ltd. has successfully established in the beginning and running continuously 24 hours a day. They are maintaining all the discharged parameters according to environmental law.

Figure: Effluent Treatment Plant (ETP)

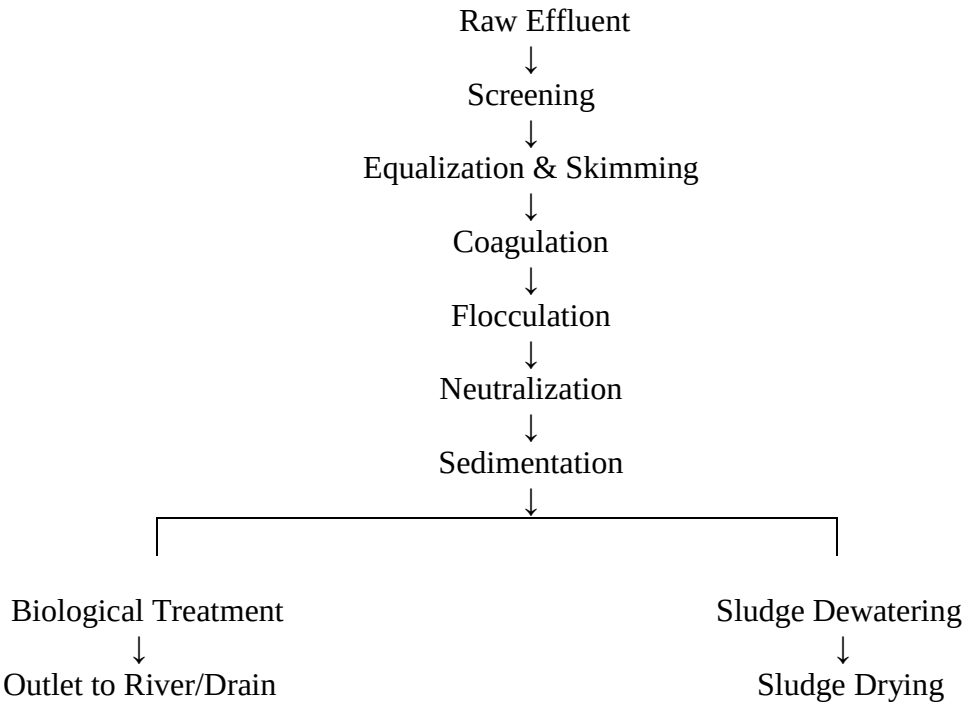
12.1 Inlet Effluent Parameters (General):

Flow Rate	30 m3/hr
PH	8-14
BOD	400-600 PPM
COD	1000-1200 PPM
TSS	200-500 PPM
TDS	3000-6000 PPM
Color	Dark Mixed
Temperature	60C

12.1.1 Outlet Effluent Parameters (Bangladesh Standard):

Flow Rate	30 m3/hr
PH	7-8
BOD	< 50 PPM
COD	<250 PPM
TSS	<100 PPM
TDS	<2000 PPM
Color	Clean
Temperature	<30C

12.1.2 Process Flow Chart:



12.2 Gas Boiler:

Brand Name : Cochran
Manufacturer: BIB COCHRAN LTD.
Type : Fire Tube
Origin : Scotland
No, of Boiler : 05
Total Capacity :33 ton

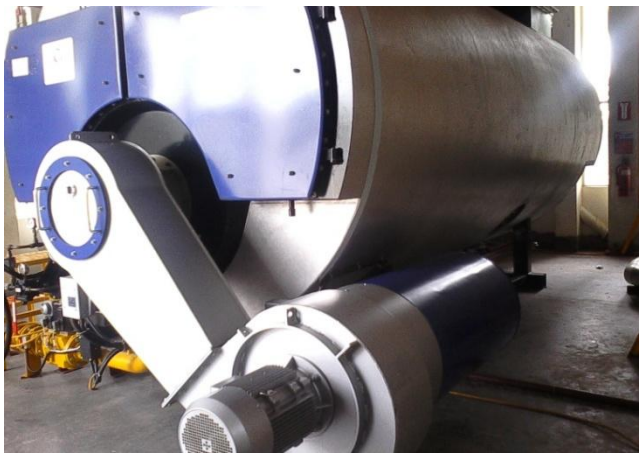


Fig: Gas Boiler

12.3 Air-Compressor

Brand Name : Atlas Copco Model : ZR 250 Origin : Belgium Maximum Air Pressure: 8.6 Bar RRM: For 1,4&5:2400 For 2&3:1480 Total Machine: 05	Brand Name : Quantima Model : Origin : Belgium Maximum Air Pressure: 10 Bar Total Machine: 04

12.4 Chiller:

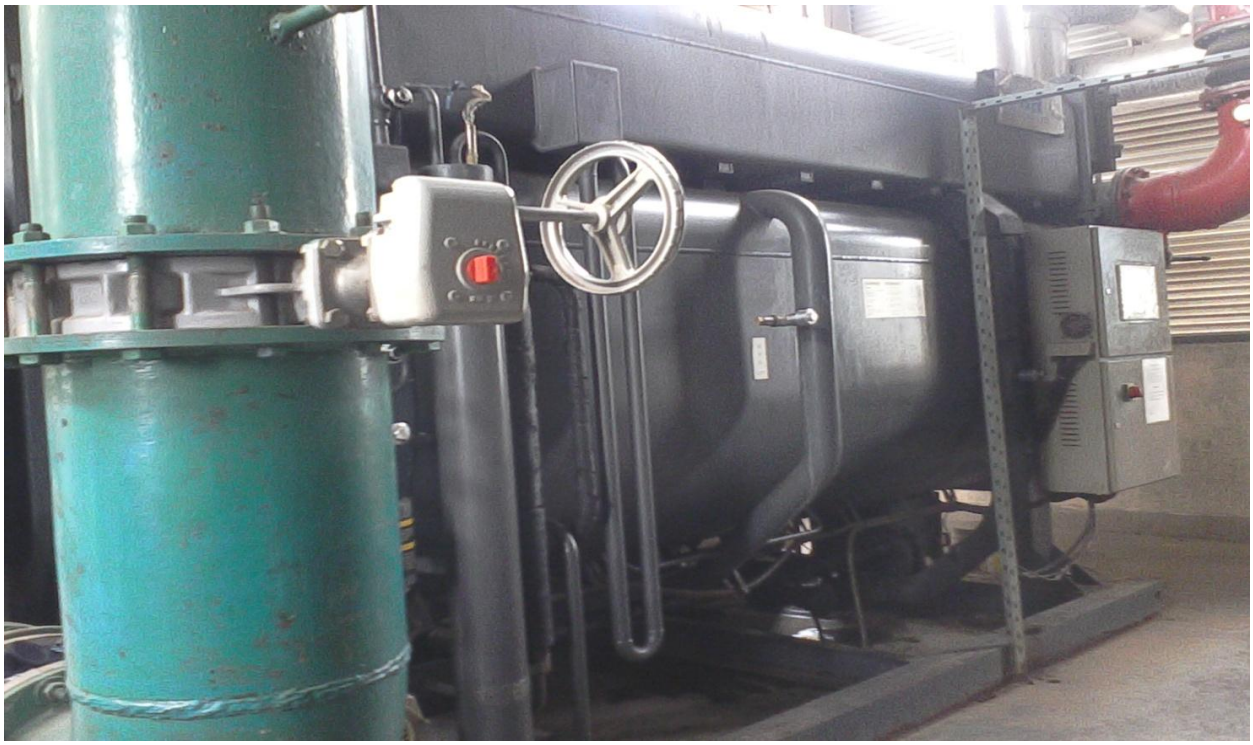


Figure: Chiller

Brand Name: Shuangling Manufacturer: Jiangsu Shaungling Air-Condition Equipment Origin: China Total Capacity: 570&250 RT No. of machine: 02	Brand Name: Thermax Manufacturer: Thermax Condition Equipment Origin: India Total Capacity: 405 RT No. of machine: 01

12.5 Work Shop:

Fig: Lathe Machine

Chapter: 13

Maintenance

13. Maintenance

Definition of Maintenance:

Maintenance is the action taken to prevent a device or component from failing or to repair normal equipment degradation experienced with the operation of the device to keep it in proper working order.

13.1 Requirements for Good Maintenance:

- Good supervision & administration of maintenance department.
- Operators should be well trained.
- Proper maintenance record should be maintained.
- Adequate stock of spare parts should always be kept.
- Manufacture of the machine tools should be consulted as & when required.
- Maintenance department should remain in contact with planning & purchasing department deciding the type of machine tools to be purchased.

13.2 Maintenance Schedule:

In Ball warding, Dyeing, LCB, Sizing, Finishing, Inspection maintenance one times in a month.
In weaving section loom are maintain Half weekly, Weekly , Half Monthly, Monthly ,Half yearly & yearly.

14. Discussion

Envoy Textiles Ltd. is the largest and most versatile business conglomerate in the private denim sector in Bangladesh. Envoy Textiles Ltd. is committed to the best human workplace practices. Their goal is to continuously improve their Human resource policies and procedures through education, training, communication and employees involvement. Right from inception the policy of the company has been to provide total customer satisfaction by offering quality denim fabric in time. The working environment of Envoy Textiles Ltd. is very cordially & friendly. All of the executives & employees of Envoy Textiles Ltd. are very much cordial & they always appreciate the learners.

The goal of Envoy Textiles Ltd. is to get high production & to maintain the quality of the product at a minimum cost.

Limitations of the Report:

- ✓ I have a very limited time. In spite of my willing to study more details it was not possible to do so.
- ✓ Some of the points in different chapter are not described as these were not available.
- ✓ The whole process is not possible to bind in such a small frame as this report, hence my effort spent on summarizing them.

Envoy Textiles .Md. Monirul Islam, monir23-2146@diu.edu.bd, and cell: 01735481096.

Chapter: 15

Conclusion

15. Conclusion

I have completed my industrial attachment successfully by the grace of Allah. Industrial attachment sends me to the expected destiny of practical life. Though it was established only a few years ago, it has earned "very good reputations" for its best performance over many other export oriented textile mills.

Mill is settled with utility to give all convenient supports to the productions for twenty-four hours. It had self-power generator system to satisfy total power consumptions of the mill.

I am enough fortunate that I have got an opportunity of having a training in this mill. During the training period I have received co-operation and association from the authority full & found all man, machines & materials on appreciable working condition. All stuffs & officers were very sincere & devoted their duties to achieve their goal.

Finally I would like to wish Envoy Textiles Ltd. to have a blast & thanks to administration of Envoy Textiles Ltd. for their cordial attitude to me.