Faculty of Engineering

Department of Textile Engineering

REPORT ON

Industrial Attachment
At
NZ TEX GROUP
Vulta, Rupganj, Narayangonj, Bangladesh.

Course Title: Industrial Attachment
Course Code: TE431

Submitted By

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Supervised By

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

Advance in Fabric Manufacturing Technology
April, 2018

DECLARATION

We hereby declare that, this report has been done under the supervision of **Dr. Md. Mahbubul Haque,** Head of the Textile Department and co-supervision of Daffodil International University. The total report is written on our own language and on the basis of our own industrial work. There is no part of this paper consists of borrowed materials or reproduced from others.

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This is to certify that the above declaration made by the candidates is correct to the best of our knowledge.

Latter Of Approval

This report on **NZ TEX GROUP** is prepared by **Shuvo Ghosh ID: 143-23-3999 & Md. Raihan Khan ID: 143-23-3997.** This report is submitted in partial fulfillment of the requirements for the degree of Bachelor of Science in Textile Engineering. The whole report is prepared under the supervision of Prof. Dr. **Md. Mahbubul Haque**. During this report the students were found sincere, punctual and hard working. We wish them every success in life.

Supervised By

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Acknowledgement

First we are expressing our heartiest thanks and gratefulness to almighty Allah for his divine blessing makes us possible to complete this report successfully.

Special thanks to our honorable **Prof. Dr. Md. Mahbubul Haque,** Head of Textile Engineering Department, Daffodil International University for giving his continuous guideline to improve and write this industrial training report. Without his support and direction it would never be possible for us to make this report.

We also like to convey our thanks to **Md. Al-Amin,** Manager of weaving & planning & **Md. Mamun Islam**, Production officer, NZ TEX GROUP for the cordial and friendly support during the initial work. We also express our deep gratefulness to so many people who helped us during this by their valuable speech, time, hospitality & cooperation.

While preparing the report we have taken help from various references. So our cordial thanks to them. Finally we hope that the report will help in understanding the Fabric Manufacturing, production and quality in fabric manufacturing industry in a clear and concise way.

In this report, we have tried to give some information about **NZ TEX GROUP** and we have observed that **NZ TEX GROUP** produce high quality Fabrics and fulfill the special requirements from the different types of buyers by following different internationally recommended standard method.

Contents

Chapter 1

Executive summary

Executive summary

Textile education cannot be completed without industrial training, because this industrial training minimizes the gap between theoretical and practical knowledge and make accustomed to industrial environment. Without adequate practical experience it is impossible to understand theoretical aspects and its implication. Industrial attachment is the process, which builds understanding, skills and attitude of the performer, which improve one's knowledge in boosting productivity and services. Through this attachment, we can know about theoretical implementation on industrial basis. We can know more about the machineries used at the different departments and their technical specifications, parameters, operating system, etc. and we think without doing this type of industrial attachment it is not possible to acquire industry based knowledge properly about textile engineering.

This report has been arranged on the basis of Industrial Attachment on Fabric Manufacturing Technology (Warping, Sizing, Weaving and Finishing). Here in this report we will present different working procedure for production of woven fabric in the industry. We will present here the procedure and process of different types of warping system, weaving process, fabric inspection, pretreatment, quality control, finishing, necessary information about utilities, number of machines, machine specifications, manpower, organogram, maintenance, name of the buyer, production capacity, layout plan of the different section of NZ TEX GROUP.

Our internship at **NZ TEX GROUP** was for two months from **10th January to 9th March**. During this internship we learned about the fabric manufacturing process and also addresses with some new fabric that we tried to discuss in chapter three.

Chapter – 2

Information about Factory

2.1 About NZ TEX GROUP:

NZ TEX GROUP is one of the most leading textile company in Bangladesh which is situated just beside Dhaka-Sylhet highway road at Vulta, Rupgonj, Narayngonj. Since the inception in 1982, NZ TEX GROUP has expanded manifold over the years and today NZ TEX GROUP is one of the most diversified and independent manufacturing conglomerates in the textile industry of Bangladesh. With the vision and philosophy of partner and the customers, NZ TEX GROUP made every effort to involve in all areas of textile industry like spinning, dyeing, weaving and finishing.

The vertically integrated production facility enables NZ TEX GROUP to offer quick response to changing fashion and allowed attention to quality control. With a firm commitment to achieve excellence in quality of service. The company has always tried for creating wide array of products and offer superior value proposition.NZ TEX GROUP believes that largest technology and motivated professionals are indispensable essences for success. They also believes that customers are their first and foremost priority in driving their business and they take great pride in their ability to perform with excellence and discipline. NZ TEX GROUP is proud to be recognized as socially responsible company. The way of NZ TEX GROUP's operation reflects great concern for environment and keep nature least affected. We are really proud to have a chance to intern at NZ TEX GROUP.

2.2 Company Location Map:

Figure 1 Company Location

2.3 Company Profile:

Factory Name : NZ TEX GROUP

Factory Type : 100% Export oriented fabric manufacturer.

Date of Establishment : 1st November 1982.

Owner & Investors : Md. Nuruzzaman Khan / Family owned business.

Capital Investment : $USD 241 million

Factory Address : Dhaka Sylhet Highway Vulta,
Rupgonj, Narayangonj,
Bangladesh.

Head Office : 181 Khan Plaza, Arambagh,
Motijheel, Dhaka-1000,
Bangladesh.

Marketing Office : Empori Financial Center,
Road#93, Plot#06, CNE (A)
1st Floor, Gulshan North Avenue
Dhaka-1212, Bangladesh.

Total Land of Area : 2.5 million square feet.

Total Employee : Over 7000 people.

List of Department : Spinning, Dyeing, Weaving & Printing.

Certification : ISO 9001:2000, Gots, Oeko-tex, BGMEA.

2.4 Production Capacity of NZ TEX GROUP:

Spinning	Dyeing	Weaving	Printing
▪ Total Spindle – 164k	▪ Non Denim – 2.2 million meter/month.	▪ Total Machine – 304.	▪ Up to10 color printing ability.
▪ Yarn Production – 80 ton/day.	▪ Denim – 1.5 million meter/month.	▪ Fabric Production – 3 million meter/month.	▪ 1 million meter/month.

Table 1 Production Capacity

2.5 Product of NZ TEX GROUP:

Non-Denim	➢ Voil/Cambric (6-100 count) ➢ Poplin. ➢ Twill. ➢ Sateen. ➢ Canvas ➢ 100% Cotton. ➢ Cotton-Spandex ➢ Slub ➢ Linen. ➢ Colored Neps. ➢ Tensile and Modal ➢ Lyocell.
Denim	➢ Ring Denim. ➢ Regular/Plain Denim. ➢ Slub Denim. ➢ Chambray Denim. ➢ Stretch Denim

Table 2 Product

2.6 List of Buyers:

Buyer Name	Country	Logo
H&M	Sweden	
Tesco	Hong kong	
Next	United Kingdom	
American Eagle	United Kingdom	

H&S	America	
Bershka	Spain	
Orsay	Germany	
Uniqlo	Japan	
Celio	France	
Mother Care	United Kingdom	
Kiabi	France	
VF Asia	China	
JC Penney	America	
Sears	United States	

Table 3 List of Buyers

2.7 Layout Plan of NZ TEX GROUP:

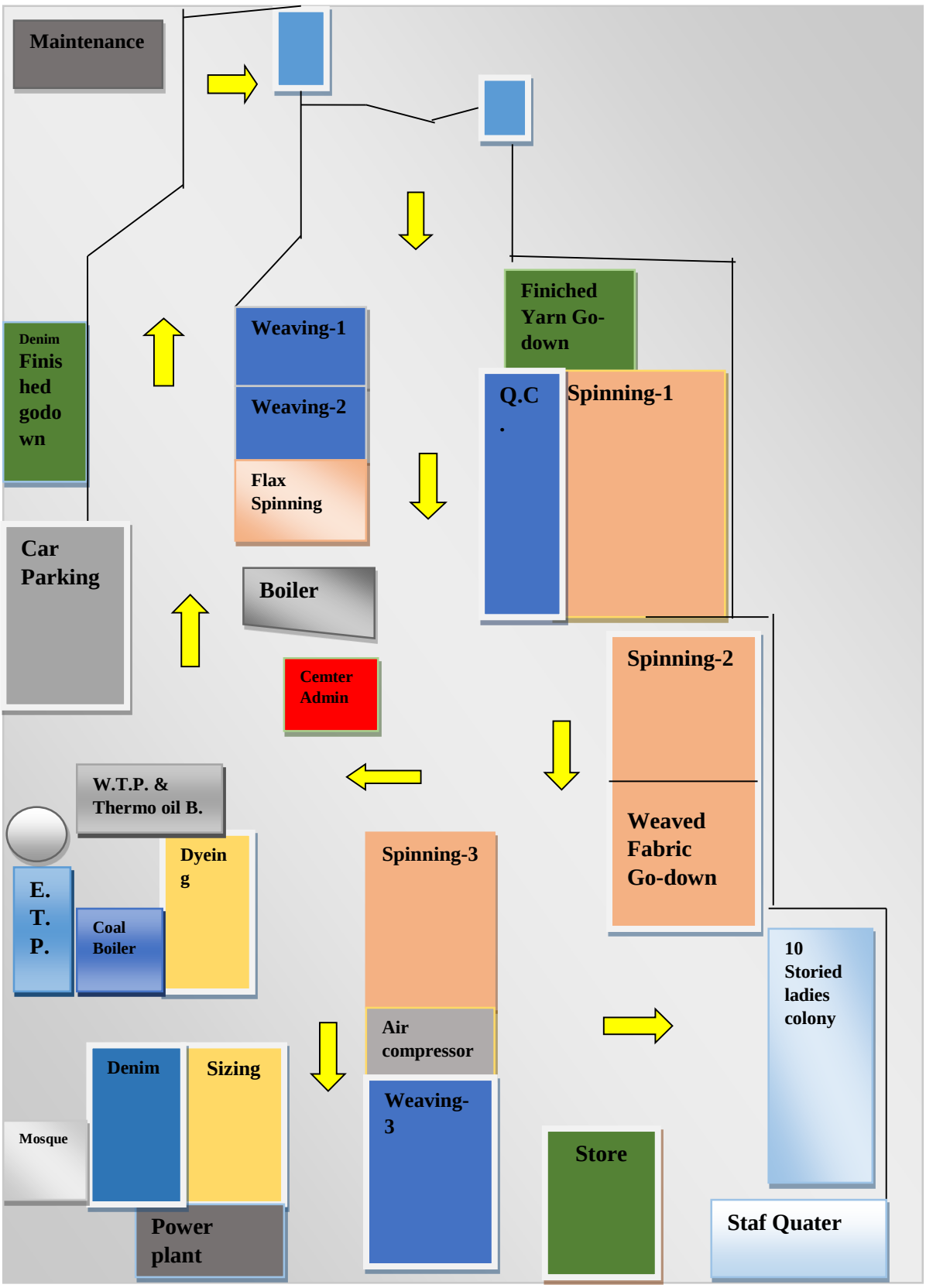
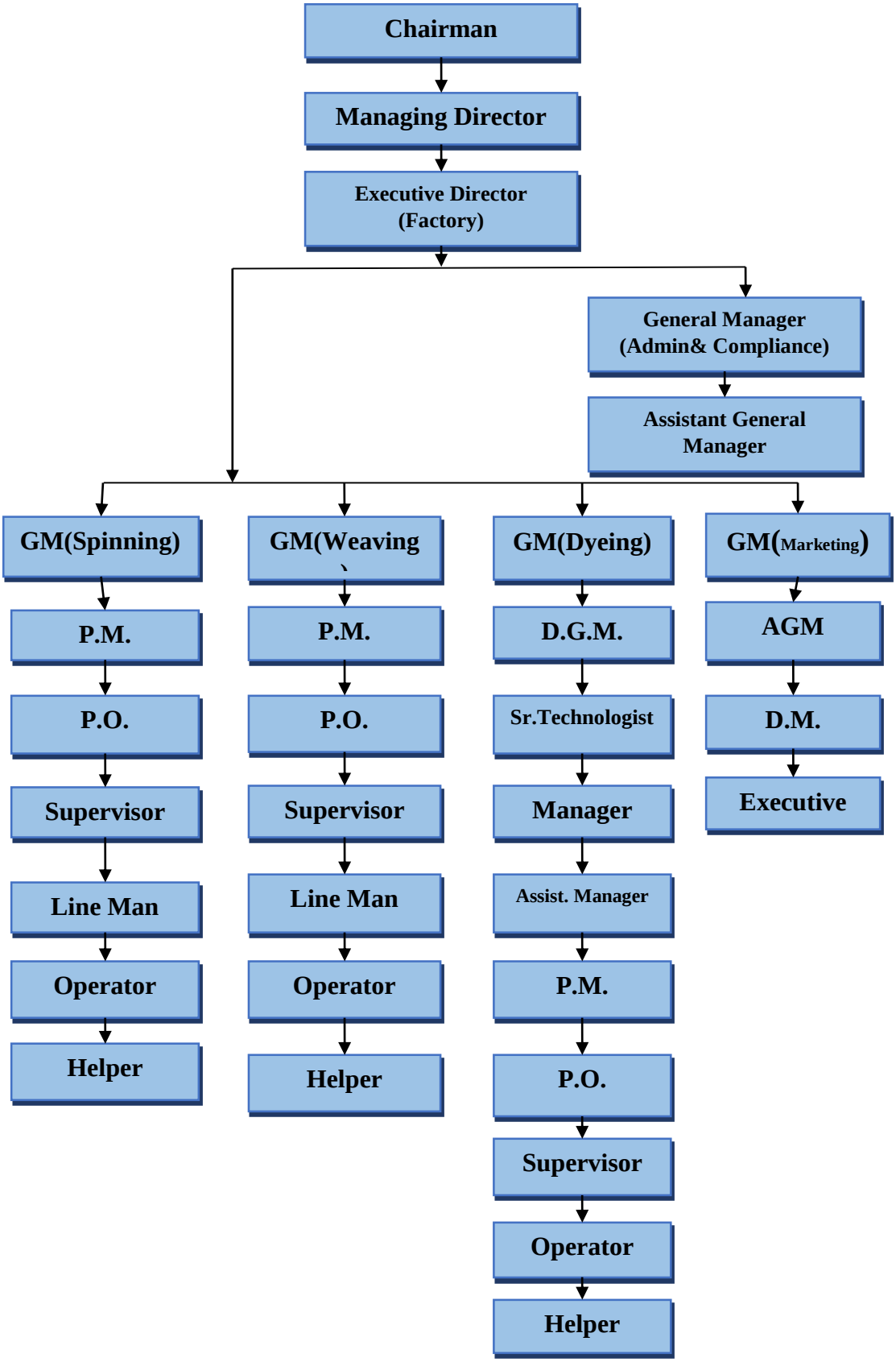


Table 4 Layout Plan of NZ TEX

2.8 Organogram of NZ TEX GROUP:



2.9 Social Policy of NZ TEX GROUP:

The NZ TEX GROUP 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.

To that end NZ TEX GROUP has identified eight (8) areas of importance. The company commits to management review, employees open communication, policy development and coordination with the SA 8000 standard to comply with all state/local laws and industrial/factory laws of peoples republic of Bangladesh to provide a favorable employment environment that respects understands the needs of its employees. The company commits to inform all employees of its policy and position on the SA 8000 standard. All employees will be made aware of the policy and company statement upon implementation.

Going forward all new employees will be trained on SA 8000 in new employees' orientation. Periodically throughout the year the company will reaffirm its commitment to the SA 8000 policy through employee communications such as office notice, demonstration and payroll stuffers.

The eight (8) identified areas are:

- Child labor
- Forced labor
- Health & Safety
- Freedom of assembly/ Right to collectively bargain
- Discrimination
- Disciplinary practices
- Working hours
- Remuneration/ Compensation.

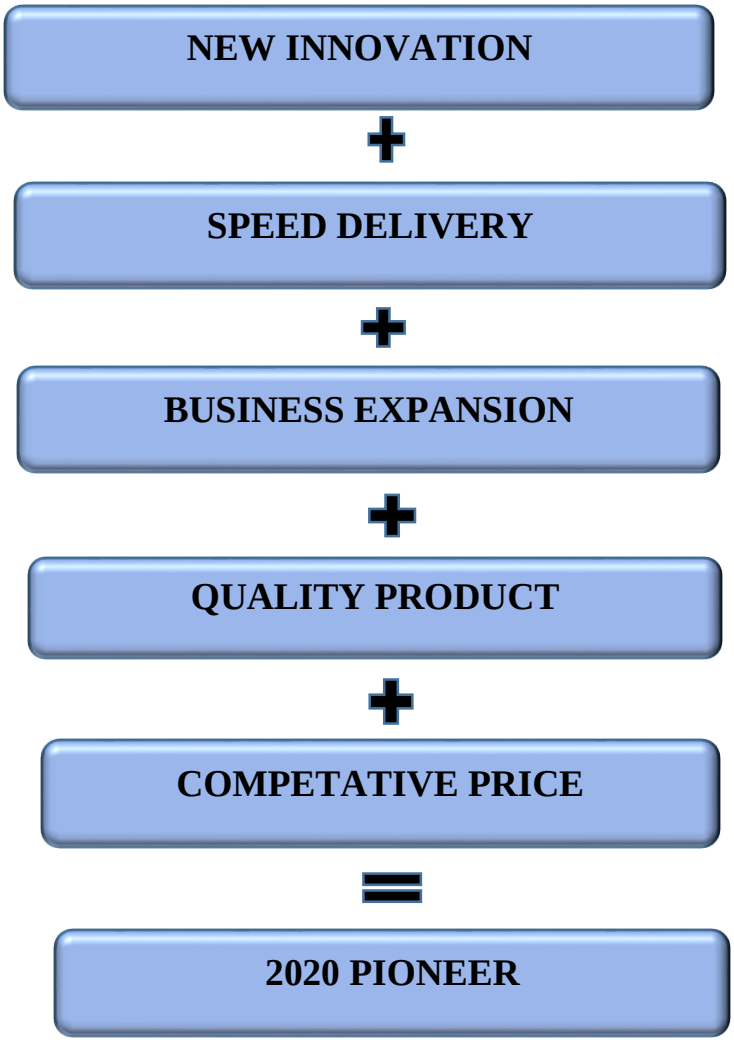
2.10 Management Team of NZ TEX GROUP:

As a young and dynamic company with an edge in marketing, success achieved through a team of dedicated and experienced top management people and young professionals with firm commitment at midlevel management. The team is well placed to offer just what international market requires from a manufacturing partner. Most of the top management does have long experiences in marketing, production, quality control, logistics and system implementation.

2.11 Mission and Vision of NZ TEX GROUP:

To provide customer with quality product in a faster manner. By our vertical setup we will satisfy customer which will help to make our sustainable growth. They target is to be one the best leading companies in Bangladesh and to build a true marketing lead enterprise with motive workforce, innovation mission and understanding global market.

By 2020 NZ TEX GROUP will be one of the pioneer woven manufacturer in the world by its diverse products, speed delivery, business expand and competitive price.



CHAPTER – 03

Details about Industrial Attachment

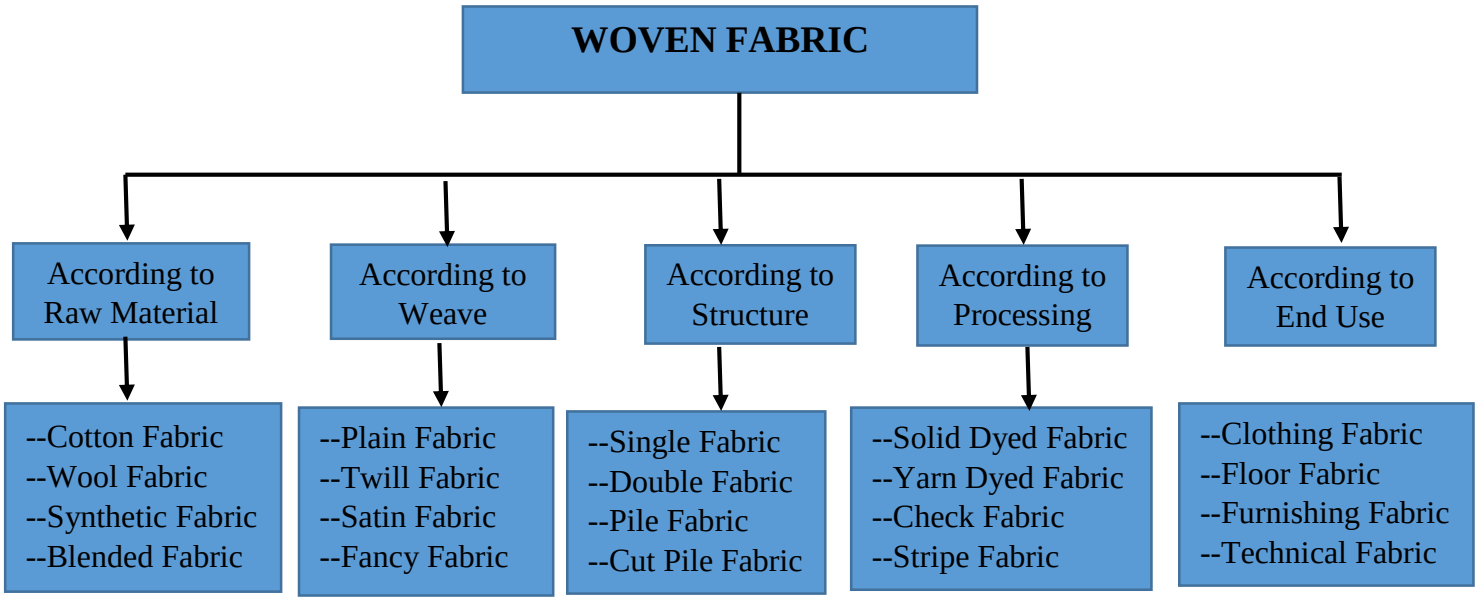
3.1 Weaving

3.1.1 Introduction:

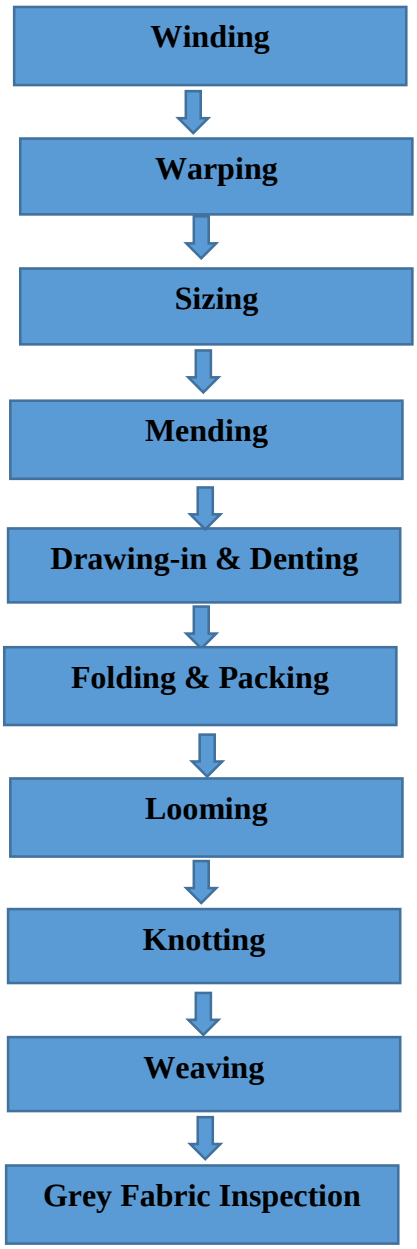
Weaving is one of the processes that required in textile in terms of producing a fabric. From the fiber then become a yarn through some other process, weaving is a process of interlacing two types of yarn known as warp or ends (run parallel to the weaving machine known as loom) and weft or filling yarn (run perpendicular to the loom) to produce a rigid fabric.

Figure 2 Weaving

3.1.2 Classification of Woven Fabric:



3.1.3 Flow chart of weaving:



3.1.4 Layout Plan of Weaving Preparatory Section at NZ TEX GROUP:

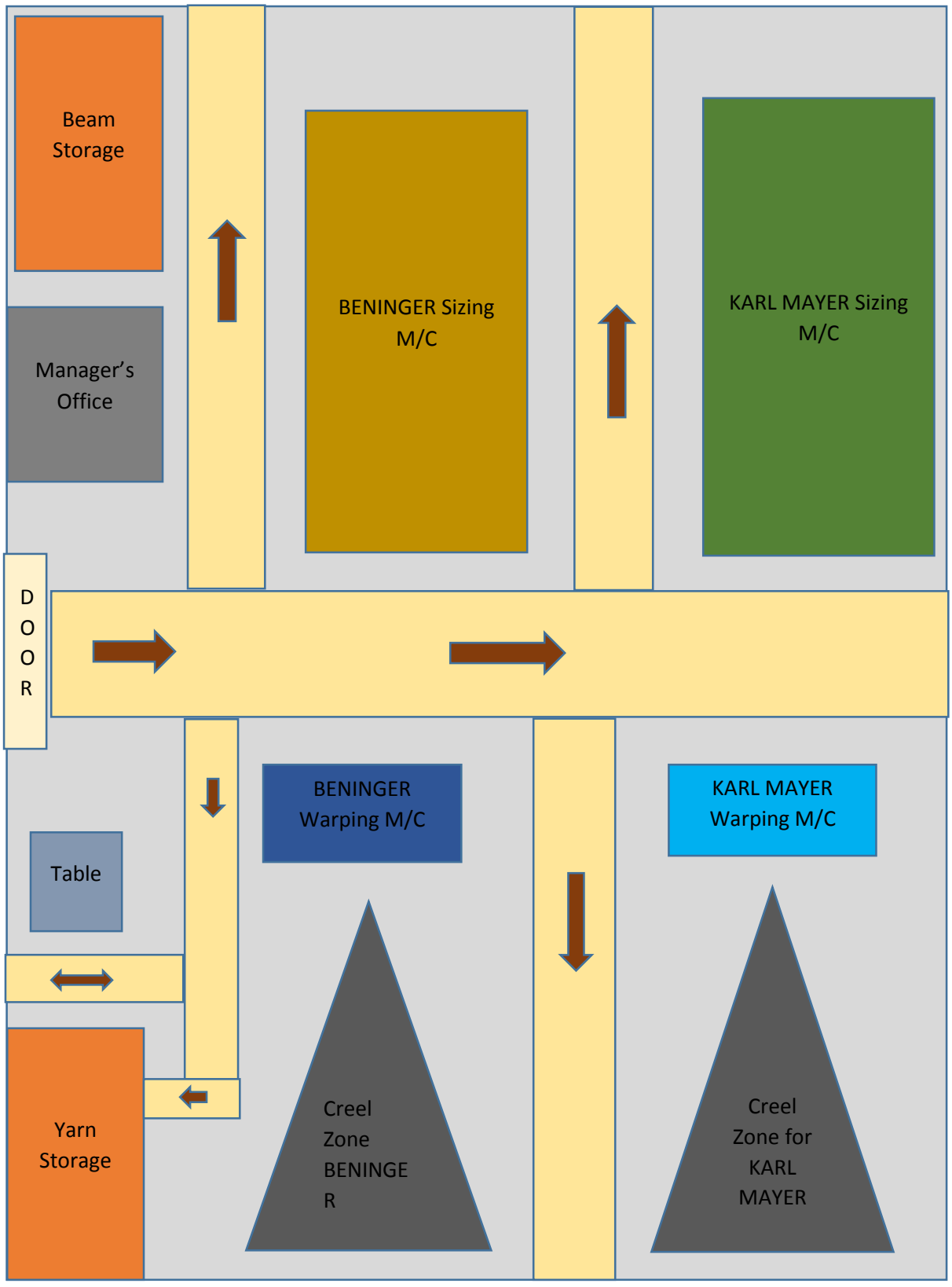


Figure 3 Layout Plan of Weaving at NZ TEX

3.2 Winding

Winding is one of the most important operation in fabric manufacturing .Winding is the process of transferring yarn from ring, bobbin ,hank etc. to a suitable yarn package for further operation. It may be electrical or mechanical.

For warp yarn package - Cone, Cheese, Flanged Bobbin.
For weft yarn package – Pirn, Cop.

3.2.1 Objects of winding:-

- To transfer yarn from one package to another suitable package that can be conventionally used for weaving purpose.
- To remove yarn faults like hairiness, neps, slubs and other foreign matters.
- To improve yarn quality.
- To get a suitable package for weaving.
- To store the yarn.

3.2.2 Types of winding package:-

There are 3 types of winding package. They are,

- Parallel Winding.
- Non Parallel Winding.
- Cross Winding.

Parallel Winding:-

In this type of winding yarns are wound parallel to each other on package containing flanges on both side of the package. For example warp beam, weavers beam.

Figure 4 Weavers beam

Non Parallel Winding:-

This package contains one or more threads which are laid very nearly parallel to the layers already existing on the package. For example Pirn, cop etc.

Cross Winding:-

This type of package contains a single thread which is laid on the package at an appreciable helix angle so that the layers cross one another to give stability. For example cone, cheese.

3.3 Warping:

Warping is the first process of fabric manufacturing. The parallel winding of warp yarn from winding package on to a common package is called warping. After winding, warping process is done for making a warper's beam. Warper's beam is produced from a set of yarns of same yarn count or different. It is needed to confirm that warp beam is make from good warp yarn otherwise weaving performance will be hampered. So it needs to require providing a good warp beam.

3.3.1 Objects of warping:

- To wound required length of warp yarn to a warp beam.
- To improve yarn quality.
- To improve weaving quality.
- To increase production.
- To decrease wastage.

3.3.2 Process flow chart of warping:

Yarn cone from spinning

↓

Creeling

↓

Control the yarn

↓

Drawing

↓

Winding on a drum or beam

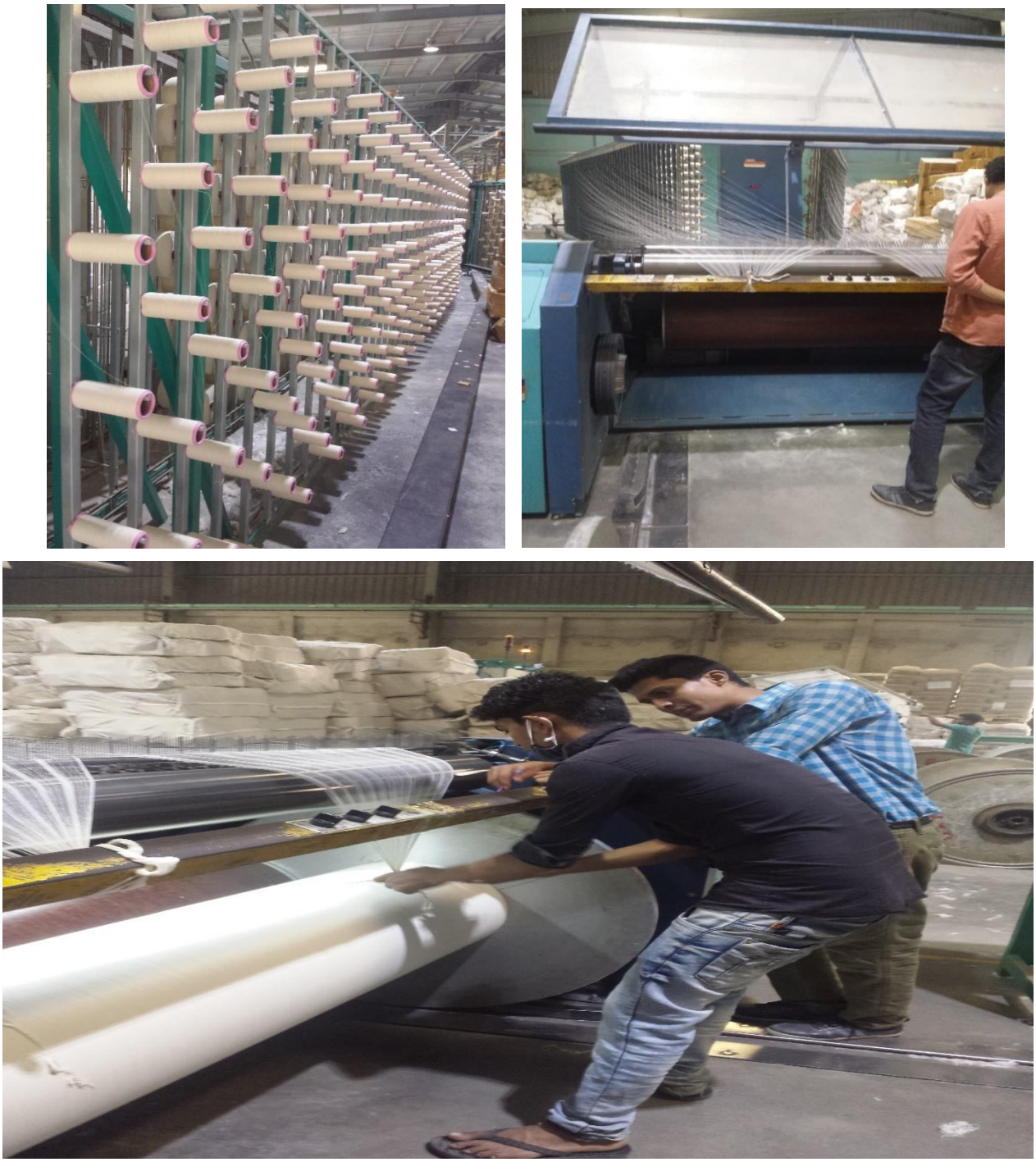


Figure 5- Warping

3.3.3 Types of warping done at NZ TEX GROUP:-

- Single or Direct Warping.
- Ball Warping.
- Sectional Warping.

3.3.4 Features of warping machine at NZ TEX GROUP:-

- M/C Name – KARL MAYER
  Origin - China
  Creel Capacity – 720
  Beam Width - 2200mm.

- M/C Name - BENNINGER
  Origin - Switzerland.
  Creel Capacity – 784 (useable 658)
  Beam Width - 1800 mm.

Figure 6 warping m/c

3.3.5 Warping Calculation:

$$\frac{\text{Yarn Length} \times \text{No of creel}}{\text{Yarn Count} \times 768} \times 2.2046 \text{ kg}$$

3.4 Sizing

Sizing is the process of applying a coating of sizing materials on to the surface of yarn to increase the yarn strength. Sizing is called the heart of weaving. For better weaving we must ensure better sizing.

3.4.1 Objects of Sizing:-

- To increase yarn strength.
- To remove hairiness of yarn.
- To increase production.
- To decrease yarn breakage while weaving.
- To improve weaving quality.

3.4.2 Changes of yarn due to Sizing:-

- Breaking Strength – Increased.
- Abrasion Resistance – Increased.
- Stiffness – Increased.
- Yarn Diameter – Increased.
- Frictional Resistance – Increased.
- Electrostatic Charger – Decreased.
- Hairiness – Decreased.

Figure 7 Sizing Process

3.4.3 Sizing Machine Specification:

- M/C Name - Ben Sizetec
  Origin - Switzerland.
  Pre beam Capacity - 16
  Drum Roller - 8
  Dryer Roller - 6
  Cooking - 1
  Reservoir - 2

- M/C Name - KARL MAYER
  Origin - China.
  Pre Beam Capacity- 16
  Drum Roller - 8
  Dryer - 6
  Cooking - 1
  Reservoir - 1

Figure 8 BENINGER Sizing Machine

3.4.4 Sizing chemicals and their functions:

- **Starch or Adhesive –**
  - Improve yarn strength.
  - Clean the yarn.
  - Improve smoothness.
  - Increase stiffness.

- **Wax –**
  - Remove hairiness of yarn.
  - Improve yarn's frictional resistance.
  - Make the yarn more slippery.

- **Binder –**
  - Make a protective coating around the yarn.
  - Increase yarn diameter.

- **PVA –**
  - Increase yarn strength.
  - Increase breaking strength of yarn.

- **Antiseptic Agent –**
  - Prevent mildew formation.
  - Protect the yarn from bacteria on fungi.

- **Antifoaming Agent –**
  - Prevent foam formation.

3.4.5 Sizing Parameters:

Yarn Count (Ne)	M/C Speed(m/Min)
16	30-45
20	40-50
30	70-85
40	80-95

3.5 Drawing-in and Denting

Drawing-in and denting is a process of drawing warp yarn from weavers beam through the drop wire, the healds eye and the reed according to fabric design. It's a very important term before weaving. At NZ TEX GROUP Drawing-in and drafting is done manually.

Figure 9 Drawing in and Denting

3.5.1 Objects of Drawing-in and Denting:

- To make the loom prepared for weaving.
- To control the warp yarns.
- To improve weaving quality.

3.6 Looming:

Looming is the process that include all warp preparation process after sizing and setup them in loom to begin fabric weaving.

3.6.1 Objects of Looming:

- To prepared the loom for weaving.
- To set up the loom.

3.7 Knotting

Knotting or Tying-up is used in term of mass production. This is the process of tied the tail end of the warp from exhausted weavers beam with the beginning of the new warp.

3.8 Weaving

Weaving is a method of textile production where two sets of yarn are interlaced with each other at right angle to form fabric. The vertical yarns are called warp and the horizontal yarns are known as weft yarn. Weaving can be summarized as a repetition of three actions which are called primary motion of loom.

3.9 Motion of loom

3.9.1 Primary:

1. Shedding - Shedding is a primary motion of loom. Shedding is the process of separating warp yarn in two groups or line by raising or lowering heald frame to form a clear path for weft insert. There are five types of shedding. They are,

- Open shed.
- Semi open shed.
- Bottom close shed.
- Center close shed.
- Close shed.

2. **Picking** – Picking is the process of weft in insertion into the loom by hand, shuttle, air, water, rapier etc. Picking are two types,

    - Positive Picking.
    - Negative Picking.

3. **Beating –** Beating is the process of pushes weft yarn to the fell of the cloth by reed.

3.9.2 The secondary motion of loom:

1. **Let off Motion:** where the warp is let off the warp beam at a regulated speed to make the filling even and of the required design. Let of motion are two types,

    - Positive let of motion.
    - Negative let of motion.

2. **Take up Motion:** Takes up the woven fabric in a regulated manner so that the density of filling is maintained. Take up motion is two types,

    - ❖ Positive take up motion.
    - ❖ Negative take up motion.

3.9.3 The tertiary motions of the loom:

To stop the loom in the event of a thread break. There are various types of tertiary motion of loom. They are,

- ❖ Warp stop motion.
- ❖ Weft stop motion.
- ❖ Warp protection motion.
- ❖ Feeler motion.
- ❖ Weft replacement motion.
- ❖ Break motion.
- ❖ Weft mixing motion. Etc.

3.10 Weaving Machine Details of NZ TEX GROUP:-

Total weaving machines – 304.

Total weaving floor – 3.

Weaving machine types – Air Jet and Rapier weaving machine.

Air Jet weaving M/C:-

- M/C Name – Toyota-Jat810
- Origin – Japan
- Model – Ja4S-190TP-EF-T810
- Reed Space – 74

Rapier Weaving M/C:-

- M/C Name – Picanol Optimax-1
- Model – Optimax-1-2-3
- Total weight – 4100kg.
- Reed Space – 220.
- Warp beam position – 13.

3.11 Layout Plan of Weaving Floor at NZ TEX GROUP:

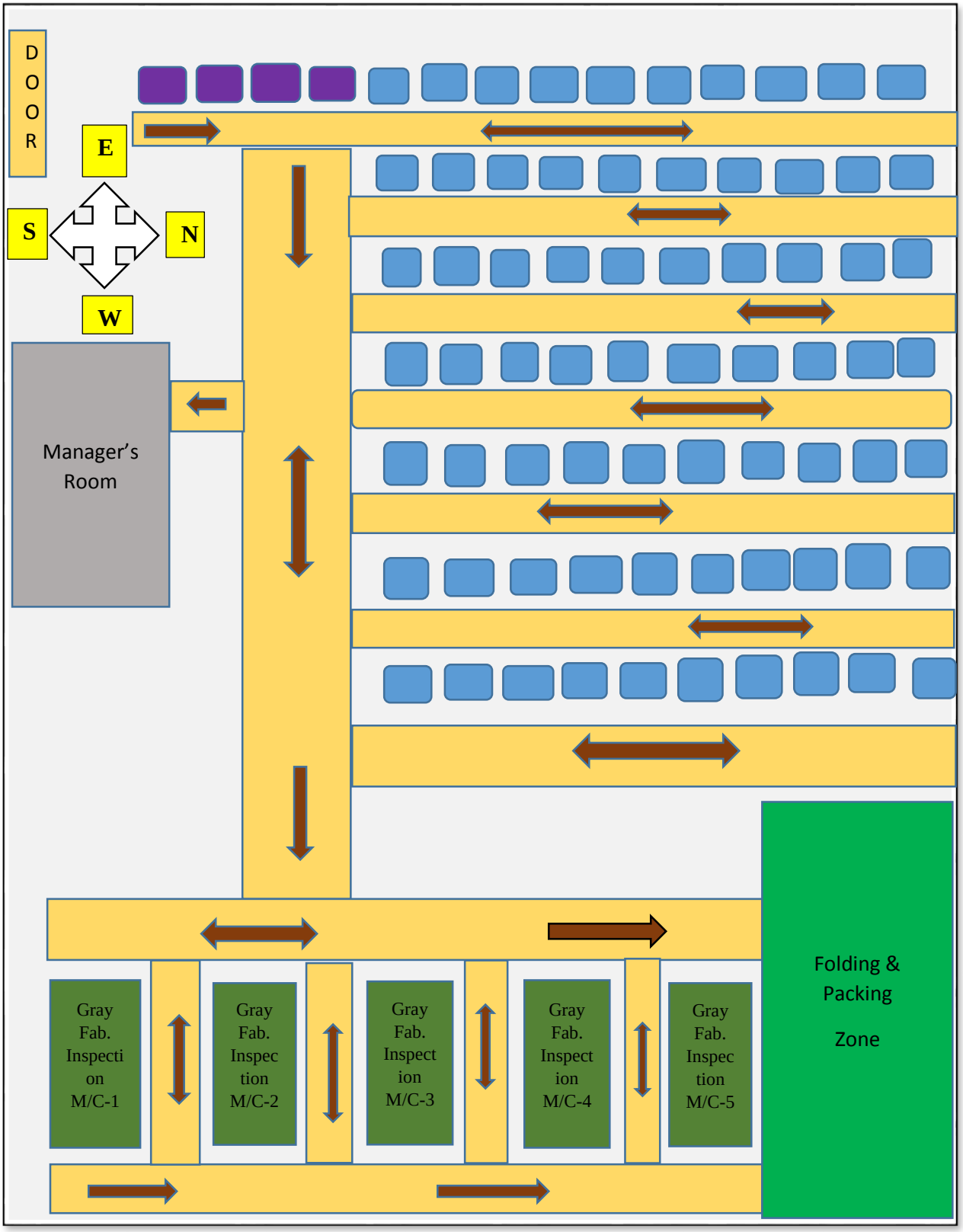


Figure 10 Layout Plan of Weaving Floor

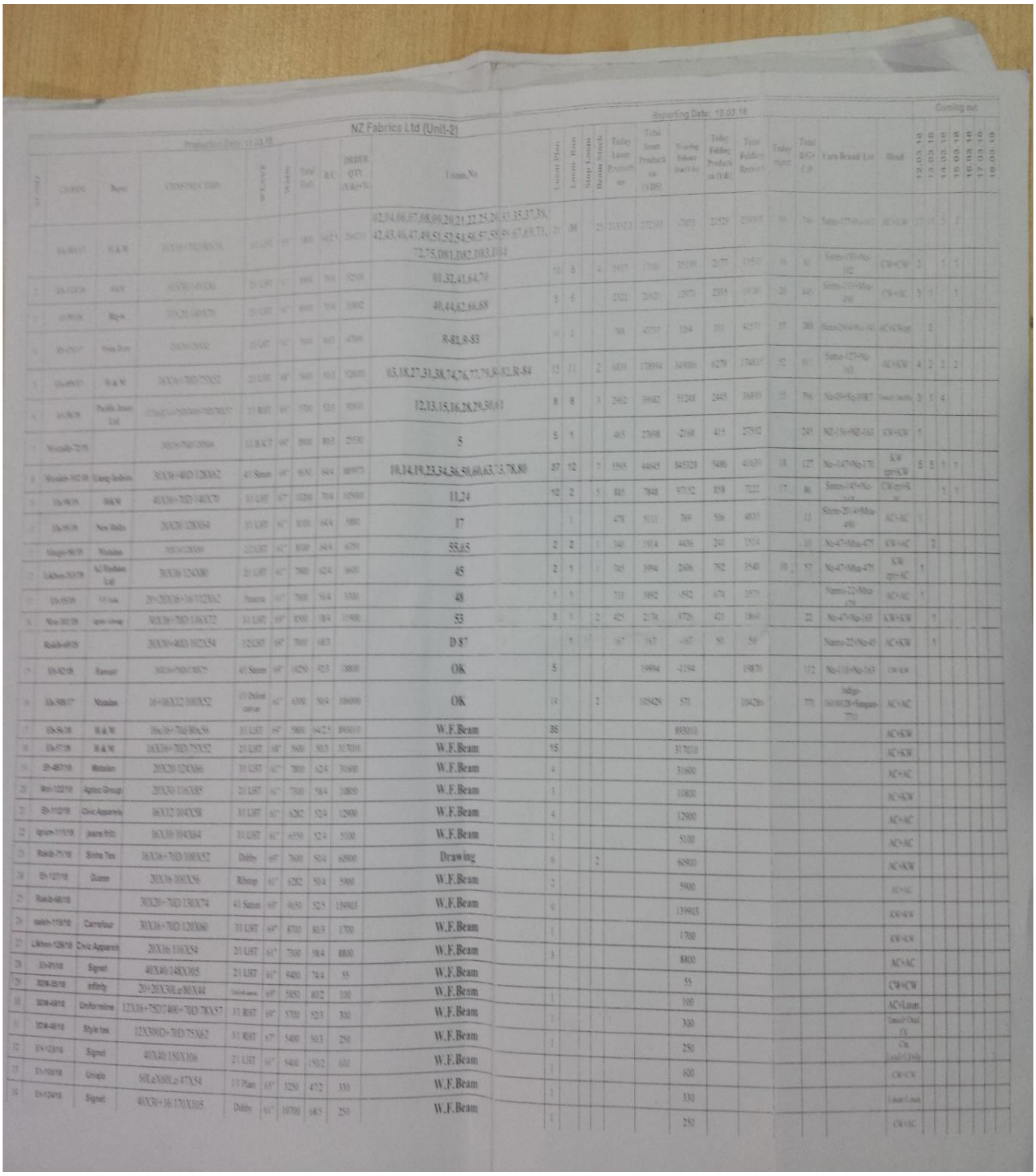
3.12 Different Parts of Air Jet Loom:-

- Main Motor.
- PC Suit.
- Automatic Full Pick Finder.
- Emery Roller.
- Optimized Slay Drive.
- Electronic Selvedge System & Electronic Rotary Leno.
- Pre Winder.
- Programmable Filling Tensioner.

Figure 11 Air Jet Loom

Figure 12 Weaving Section

3.12.1 Daily production list in weaving section:



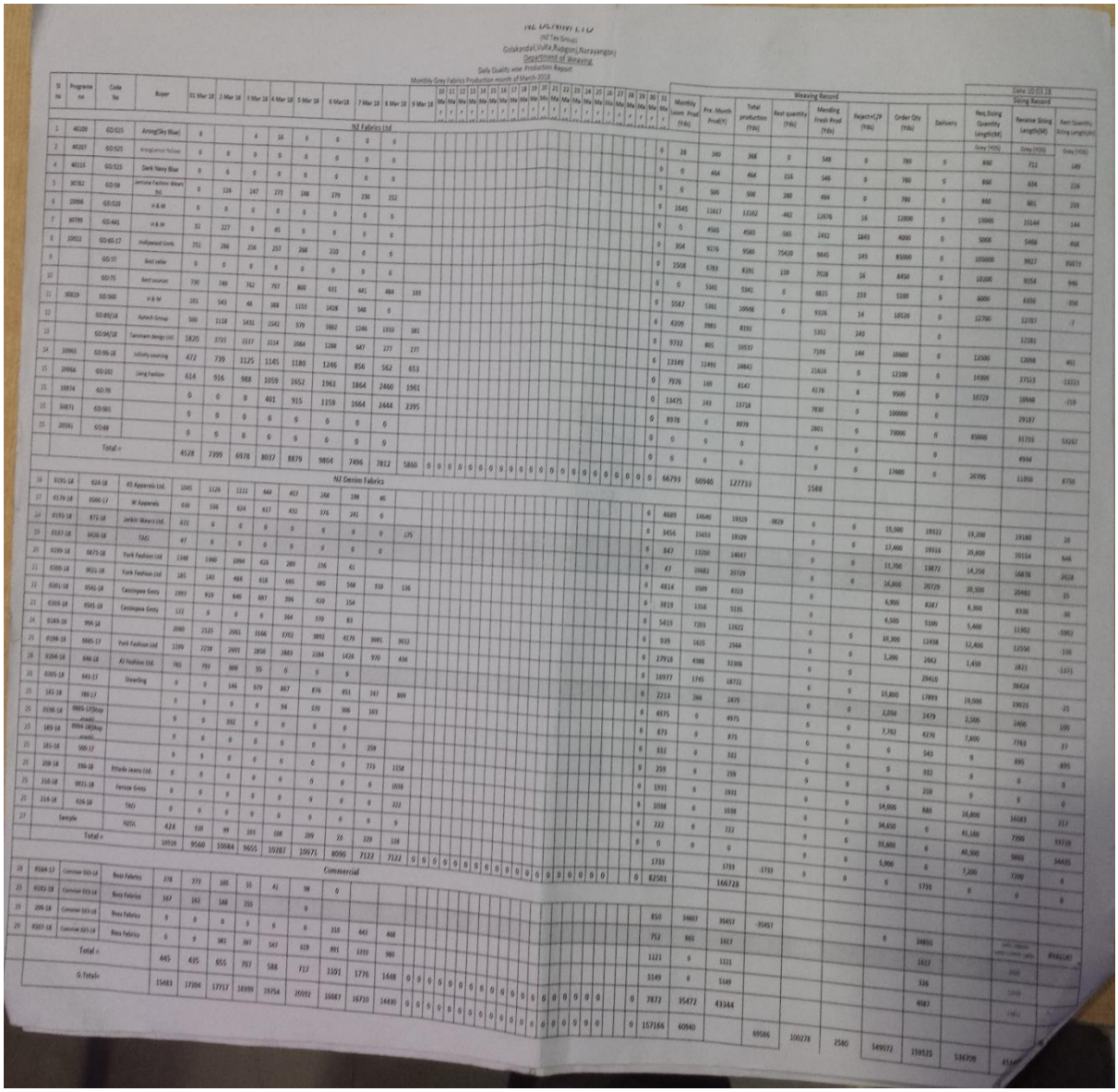


Figure 13 Daily production report weaving section

3.13 Gray Fabric Inspection-

The inspection of gray fabric is a process by which the defects of fabrics are identified and the fabrics are classified according to their degree or intensity of defects. At NZ Fabrics Ltd. 4 point system is used for gray fabric inspection.

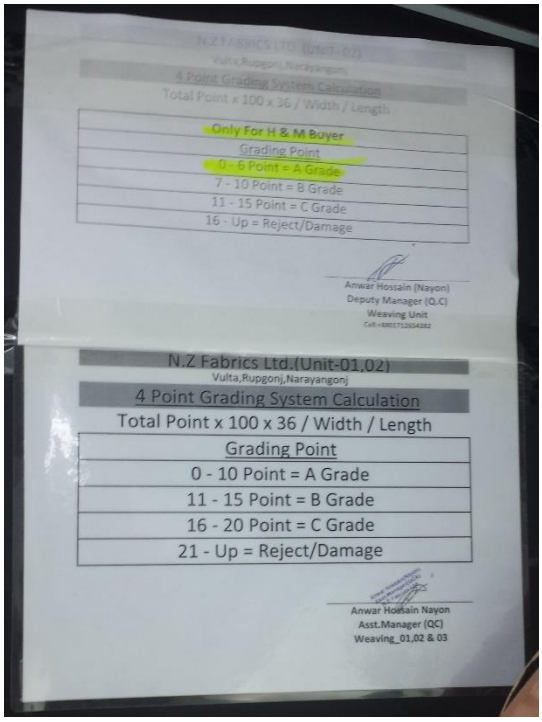
3.13.1 Fabric inspection machine details:-

- M/C Name – Yash Inspection Machine.
- Company Name – Yash Textile Machinery Ltd.
- Origin – India.
- Total M/C – 12.

Figure 14 Fabric Inspection

3.13.2 Fabric Inspection System at NZ TEX GROUP:

At NZ TEX GROUP 4 Point system is use for fabric inspection and classified the produced fabrics according to their fault percentage or quality. This company is very much strict to maintain their fabric quality. According to 4 Point inspection system every fault on fabric are remarked by a numerical point. After calculating the points fabric roll are accepted or rejected.



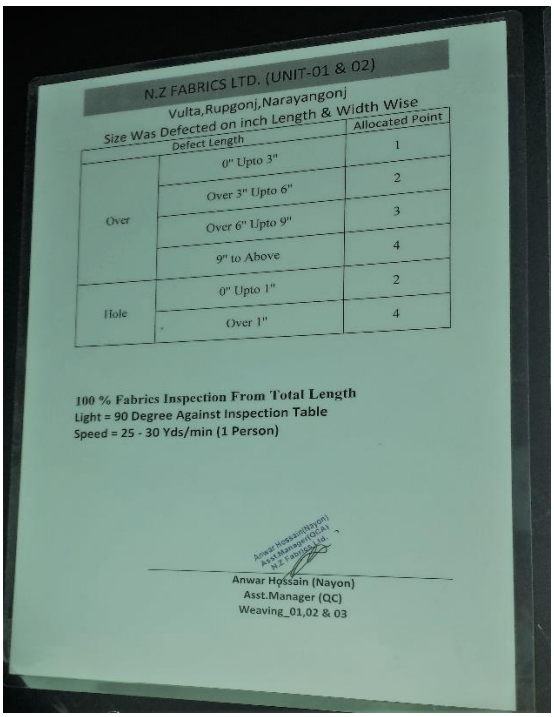


Figure 15 4 Point Fabric Inspection System

3.14 Mending

Mending is the process of repairing small holes in gray fabrics by thread and needle. This action is done manually at NZ TEX GROUP.

3.14.1 Objects of Mending:-

- To repair gray fabrics defects.
- To improve fabric quality.
- To decrease fabric wastage.

3.15 Folding & Packing-

This is the last process of weaving process. After gray fabric inspection the gray fabrics are folded as roll and packed for next process or store.

3.15.1 Objects of Folding & Packing:-

- To protect the fabrics from damage.
- To store the fabric.
- To continue next process.

3.16 Testing Lab:

Fabric testing lab is an essential part in textile industry. Production quality of any textile industry are mainly depends on its testing lab facility. To maintain required fabrics quality according to buyer's demand NZ TEX GROUP has an outstanding testing lab including all modern fabric testing machine.

3.16.1 Different Testing Methods Followed by NZ TEX GROUP:

Depending on buyer choice NZ TEX GROUP follow some standard testing methods. Such as,

- American Society of Testing and Materials.(ASTM)
- American Association of Textile Chemicals and Colorists.(AATCC)
- International Organization for Standardization.(ISO)
- European Norms.(EN)
- British Standards.(BS)
- Detaches Institute Norms.(DIN)
- Bureau Indian Standards.(BIS)
- Japanese Industrial Standards.(JIS)
- TAPPI.

3.16.2 Different Testing is done by NZ TEX GROUP:

- Color Fastness to Wash.
- Color Fastness to Light.
- PH
- Rubbing Fastness.
- Tear Strength.
- Tensile Strength.
- Pilling Test.
- Perspiration Test.
- Abrasion Resistance.
- Seam Slippage.
- Water Spray.
- Shrinkage.
- Growth Test.
- Recovery.

3.16.3 Specifications of Testing M/C at NZ TEX GROUP:

❖ **G.S.M Cutter M/C:-**

- M/C Name – GSM Cutter
- Origin – Korea.
- Method – ISO-3801

❖ **Electric Balance:-**

- Brand Name – Shimadju.
- Origin – Japan.

❖ **Tear Strength Tester:-**

- M/C Name – Elma Tester
- Brand Name – James Heal.
- Origin – England.
- Method – ISO-13937-1
- Sample Size – 10cm X 6cm

❖ **Universal Strength Tester:-**

- Brand Name – James Heal.
- Origin – England.
- Method - ISO-13937-2 (for tensile strength)
  - ISO-13936-1 (for seam slippage)
  - ISO-139365-2 (for seam strength)
- Sample Size – 20cm X 5cm

❖ **Rubbing Fastness Tester:-**

- M/C Name – Crock Master.
- Brand Name – James Heal.
- Origin – England.
- Method – ISO-105X12
- Sample Size – 14cm X 5cm

❖ **Pilling & Abrasion Tester:-**

- Brand Name – James Heal.
- Origin – England.
- Method – ISO-12947-2 (for abrasion)
  - ISO-12945-2 (for pilling)

❖ **PH Tester:-**

- M/C Name – Mechanical Shaker.
- Brand Name – GLF Rotary Shaker.
- Origin – Germany.
- Method – ISO-3071.

❖ **Dryer:-**

- Brand Name – James Heal.
- Origin – England.

❖ **Washing Machine:-**

- Brand Name – James Heal
- Origin – England
- Method – ISO-6330

❖ **Washing Machine:-**

- M/C Name – Gyrowash.
- Brand Name – James Heal.
- Origin – England.
- Method – ISO-105C06

❖ **Incubator:-**

- Brand Name – James Heal.
- Origin – England.
- Model – 21-501176
- Method – ISO-105E01 (for color fastness to wash)
    - ISO-105E04 (for color fastness to perspiration)

❖ **Hygrometer:-**

- Brand Name – James Heal.
- Origin – England.

❖ **Color Fastness to Light:-**

- Brand Name – James Heal.
- Origin – England.
- Method – ISO-105B02

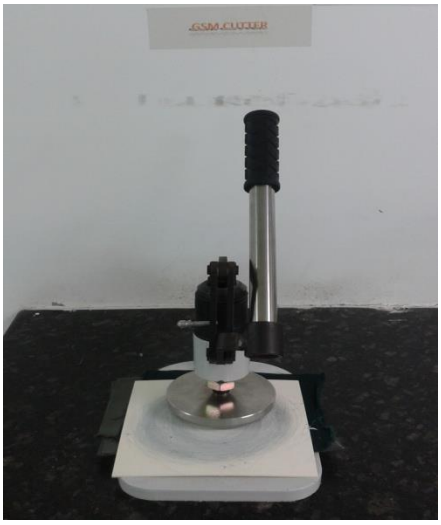


Figure 16 Testing M/C

3.17 Finishing Section:

NZ TEX GROUP has a well-established finishing floor in order to give the required finished to the woven fabric. Here all machines are new and up to date. For this reason NZ TEX GROUP is able to fulfill buyer requirements and get their satisfaction.

3.17.1 Process Flow Chart of Finishing Section:

Gray Fabric from Weaving Section

↓

Singeing & De-sizing

↓

Scouring & Bleaching

↓

Mercerizing

↓

Dyeing

↓

Washing

↓

Heat Seating / Sanforizing

↓

Calendaring

↓

Peach Finish

↓

Folding & Packing

3.18 Layout Plan of Finishing Section:

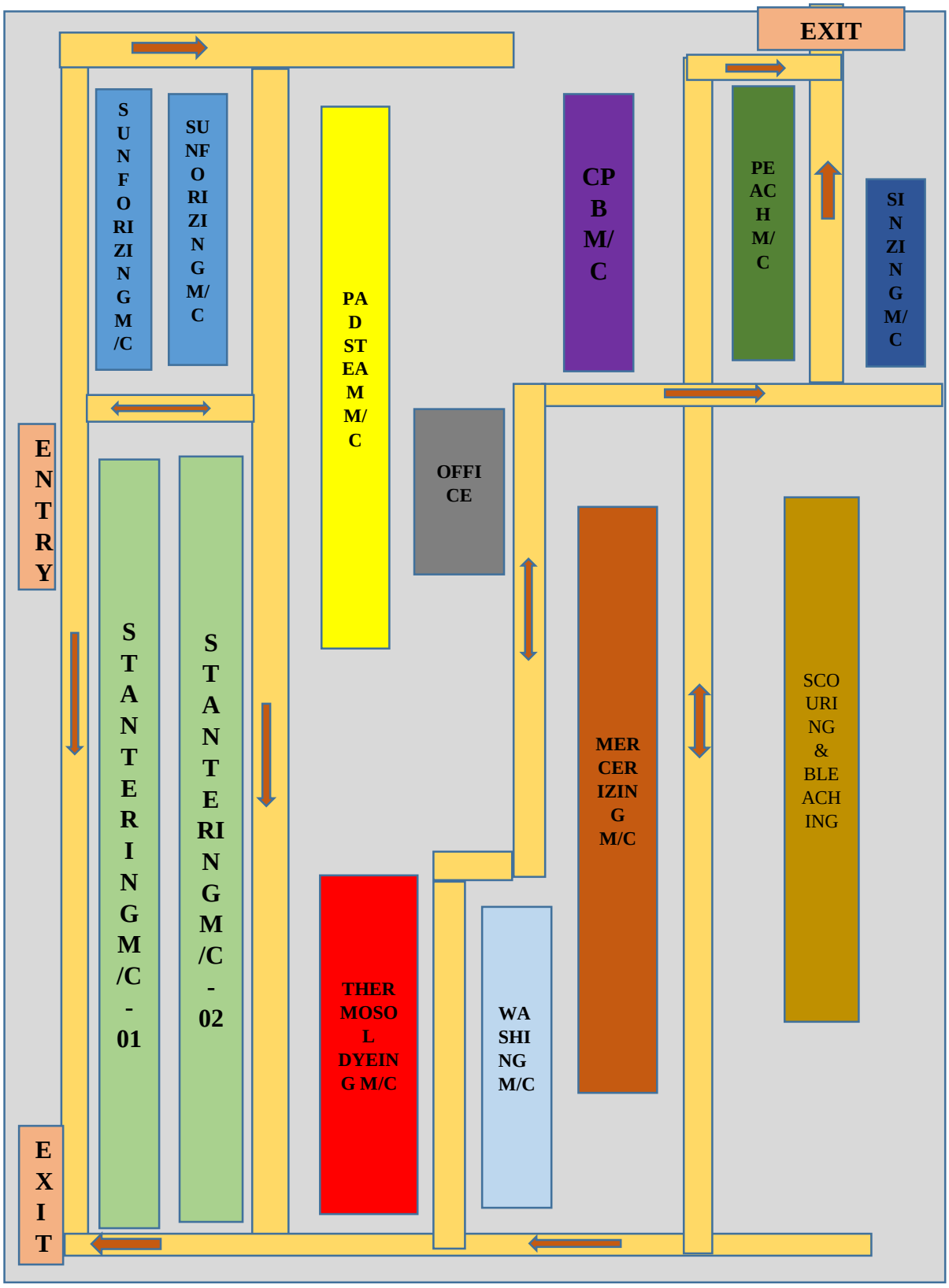


Figure 17 Layout Plan of Finishing Section

3.19 Machine specification:

List of Machine Finishing Section are given below:

SL. No.	Machine Type	Brand Name	Country of Origin
01	Singing & Desizing m/c	Osthoff senge	Germany
02	Scouring & Bleaching m/c	Kuster calico	India
03	Mercerize m/c	Goller	Germany
04	Paech m/c	Lafer	Italy
05	Thermosol m/c	Bruckner power	Germany
06	Pad Steam m/c	Kuster calico	India
07	Cold Pad Batch m/c	Benninger	Switzerland
08	Washing m/c	Goller	Germany
09	Jigger m/c	Henriksen	Holand

Table 5 Machine specification:

3.20 Utilities:

3.20.1 Electricity:

Electricity Collection from Two types:

i) Bangladesh Rural Electrification board
ii) Generator

Bangladesh Rural Electrification board:

At fast collect electricity from Bangladesh Rural Electrification board which 33kV line. Then pass power oil type transformer by underground in substation. Then pass main panel board by step down. Then pass main vacuum circuit breaker which to convert 33kV to 11kV.Than power pass dry type transformer to air circuit breaker which distribution 3600 kW different departments (such as air compressor, dyeing, weaving, and denim.) of industry.

3.21 Flow diagram of Rural Electrification board:

Flow diagram of Rural Electrification board

↓

Transformer

↓

Main panel board

↓

Main Vacuum circuit breaker

↓

Dry type transformer

↓

Air circuit breaker

↓

Distribution different section

Figure 18 REB

3.22 Generator specification:

Brand name: CATERPILLAR

Model: 1400F

Month/Year of Manufacture: 10/2016

Country of Origin: USA

Engine Serial No.: AM200432

Rated power: 1275 kVA

: 1000 kW

Power Factor: 0.80

Rated Voltage:400/230 V

Phase: 3

Rated frequency: 50 Hz

Rated Current: 1840 A

Rated R.P.M.: 1500

Altitude: 1000.0 M

Figure 19 Generator

3.23 Air Compressor (Kaeser Compressor) :

Figure 20 Kaeser Compressor

Kaeser is known worldwide for leading innovation and distribution of air system technologies, including rotary screw compressors, mobile air compressors, vacuum packages, refrigerated and desiccant dryers, and filters. Kaeser treats and delivers energy in the form of compressed air by providing sustainable and efficient system solutions.

3.23.1 Machine Specification:

Machine name: KAESER KOMPRESSOREN

Country of Origine: Germany

Baujahr: 2005

Nennleistung: 4,0kW

Motor nenndrehzahl: 3000 1/min

Max. Betriebsuberdruck: 10,0 bar

Umgebungstemperatur: +3°c / +40°c

Kaeser Compressor Parts:

Air filter element

Separator cartridge kit

Service kits

SIGMA FLUID

Filter elements

Activated carbon filter

Exchange air ends

3.24 Steam:

Sources of Steam in Dying section:

A. Thermal-oil Boiler
B. Tube Boiler
C. Coal Boiler

3.24.1 Machine Specification:

Thermal-oil Boiler:

Brand name: Inplan-ingenieurtechnik

Type: H1000

Country of Origin: Germany

Baujahr/Year of Constraction-2016

Leistaring/ output-1163 kW

Mindest volumenstrm/ minimal flow rate: 80 m3/h

Max. allowable pressure(PT): 10 bar

Prufdruck /test pressure (PT): 21.4 bar

Allowable Max. Temperature (TP):300°c

Volumen/ Volume V: 1886L

Tube Boiler:

Brand name: Cochran

Country of Origin: Scotland

Serial number:23/6432

Year of manufacture: 2016

Max. Allowable Pressure: 11.00 Barg

Max. Allowable Temperature-188°c

Max. Heat output-2507 kW

Max. Steam output-4000 kg/hur

Safety valve set pressure-10.86 Barg

Voltage-400v,3ph,50Hz,4WIRC

Coal Boiler:

Thermal oil heater

Country of Origin: China

Product model:-YLW-3500MA

Rated Power:-3500 kW

Working pressure:-0.8 Mpa

Product code:-2013 H330

Highest working Temperature:-320°c

Product date:-2013/10

Produce by:- Jiangsu Runli Boiler Co.LTD

Figure 21 Boiler

3.25 Effluent Treatment Plant (ETP):

3.25.1 Introduction:

The effluent treatment plant (ETP) is a method that is used to treat the emanation coming out from many areas of the plant. It includes biological, physical, and chemical processes. It aims at releasing safe water into the environment to prevent it from getting contaminated. These plants have been very useful in the process of providing clean water to the environment and have conserved water in a number of ways. Effluent treatment plant

3.25.2 Major sources of liquid discharge:

Woven Dyeing

Denim Dyeing

Spinning

Weaving

Coal boiler

3.25.3 Characteristics of waste water:

Liquid wastes can be described according to their physical, chemical, and biological characteristics.

- The composition of wastewater varies widely. This is a partial list of what it may contain:
- Water (more than 95 percent), which is often added during flushing to carry waste down a drain;
- Pathogens such as bacteria, viruses, prions and parasitic worms;
- Non-pathogenic bacteria;
- Organic particles such as hairs, food, paper fibers, plant material, humus, etc.
- Soluble organic material such as urea, fruit sugars, soluble proteins, drugs, pharmaceuticals, etc.
- Inorganic particles such as sand, grit, metal particles, ceramics, etc.
- Animals such as protozoa, insects, arthropods, small fish, etc.
- Emulsions such as paints, adhesives, mayonnaise, hair colorants, emulsified oils, etc.;
- Toxins such as pesticides, poisons, herbicides, etc.
- Pharmaceuticals and hormones and other hazardous substances

3.25.4 Sequence of waste water treatment:

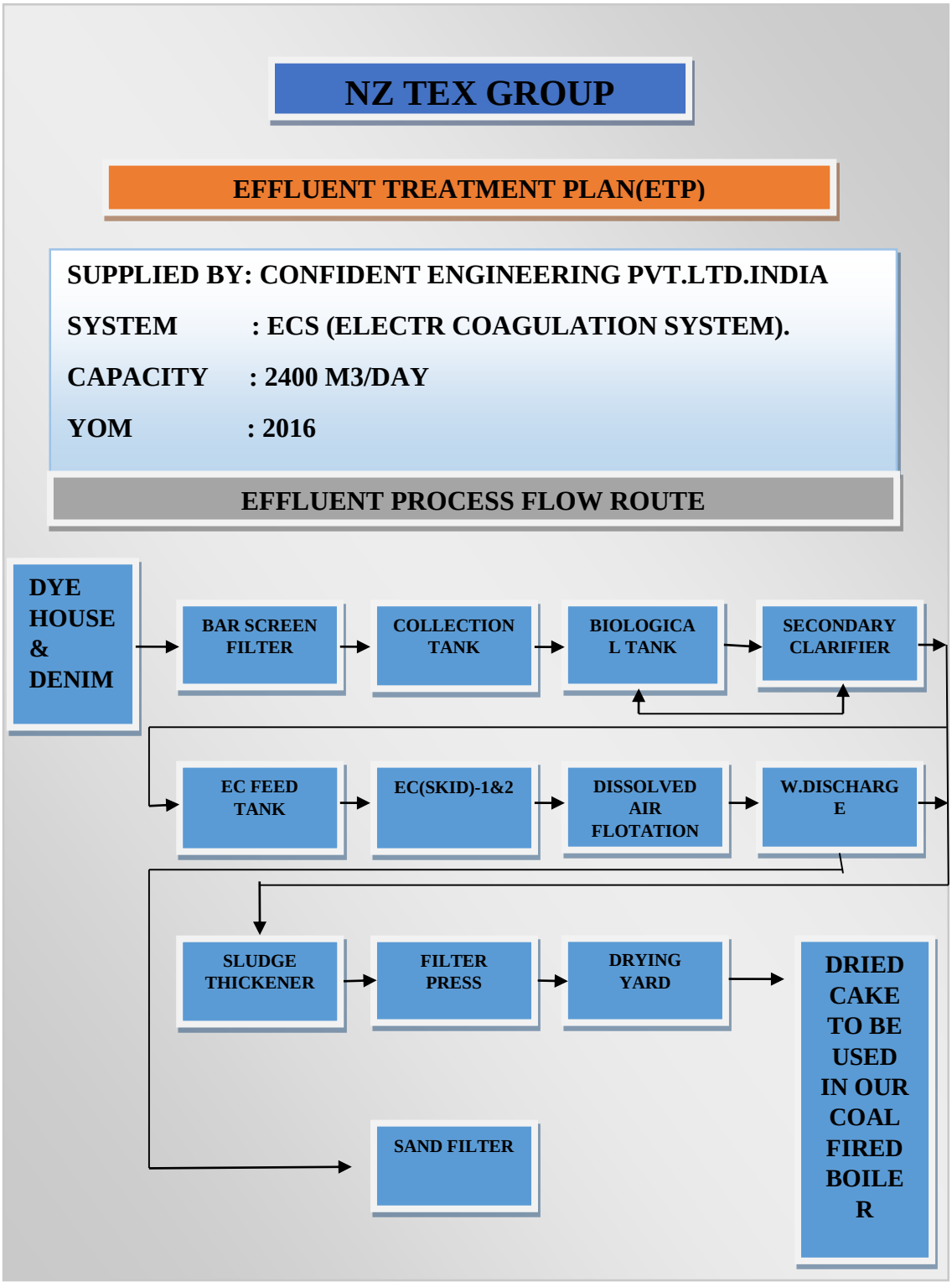


Figure 22 Sequence of waste water treatment

3.25.5 Chemicals used in ETP with their purposes of use:

i. Polymer
ii. Aluminum Chloride
iii. Hydrogen per oxide
iv. DE clear
v. Hydrochloric acid
vi. Sulphuric acid
vii. DAF
viii. Urea
ix. Mulasas
x. Etc.

- **Final treated quality:**

Water source	COD (in ppm)	BOD (in ppm)	DO (in ppm)	Free Residual chlorine	Chloride (in ppm)	Alkalinity (in ppm)	pH	TDS (in ppm)	TSS (in ppm)
Collection Tank	1760	210	1.37	Nil	274	1020	12.6	1660	260
Biological Tank	384		2.89				7.29		
Secondary Clarifier	310						7.23	1900	90
DAF Outlet	135						7.45	1950	67
Sand filter	131	47	4.64	Nil	261	870	7.47	1930	35

Table 6 Chemicals used in ETP

- **Standard Value for discharge water:**

Water quality parameter	Standard Value
COD	<200ppm
BOD	<50ppm
DO	<4.5ppm
Free Residual Chloride	<0.1
Chloride	<600ppm
pH	6-9
TDS	<2100ppm
TSS	<100ppm

Table 7 Standard Value for discharge water

Chapter 4

Impact of Internship

4.1 Impact of Internship:

We are extremely lucky to complete my internship from NZ TEX GROUP. It is one of the biggest composite industries in our country. First we met with Md. Al-Amin Manager of weaving & planning, NZ TEX GROUP who helps us to know the rules of the factory and he was arranged the internship. Here, we have shared some learnable thing regarding to our internship in different departments.

From Warping Section:

We have learnt about different types of warping system, warping machine, warping machine specifications, working procedure, the faults which may occur from warping, etc.

From Sizing Section:

We have learnt about the types of chemicals and ingredients used for sizing, sizing machine specifications, effect of sizing, etc.

From Weaving Section:

We have learnt about various type of weaving systems, weaving machine specifications, working procedure, the faults which may occur from weaving.

From Finishing Section:

We have learnt about the effect of finishing (singeing, over dyeing, mercerizing, heat setting, calendaring etc.), finishing machine specifications, working procedure, etc.

From Inspection Section:

We have learnt about different types of fabric, fabric inspecting system, inspection machines with their specification and functioning device. We have also learnt about 4-point inspection system.

Eventually we would like say this internship was totally effective for our particular academic background. In future we will try to easily cope up any kind task in the textile industry whenever we get chance to make our self as a Textile Engineer.

Chapter 5

Conclusion

5.1 Conclusion:

Industrial training is an important and essential part of education as through this training I learn all the implementations of the processes which I have studied theoretically. It gives me an opportunity to compare the theoretical knowledge with practical facts and thus develop my knowledge and skills. This industrial training also gives me an opportunity to enlarge my knowledge of textile production planning, production process and machineries.

I have found myself fortunate to have my industrial training at NZ TEX GROUP. It has a huge production capacity with a very efficient production team. NZ TEX GROUP has a very good, well equipped and modern laboratories and producing a wide range of color. Also I have noticed that NZ TEX GROUP is very concern about their quality and they rarely have any quality complain. The management of NZ TEX GROUP is very organized and co-operative.

At the end of my attachment I realized that industrial training make my knowledge more practical and make me confident to face any problem for my practical challenging life.