REPORT ON INDUSTRIAL ATTACHMENT

TALHA FABRICS LTD.

(An Enterprise of NOMAN GROUP)

Vawal, Mirzapur, Gazipur

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

ACADEMIC SUPERVISOR

Prof. Dr. Md. Mahbubul Haque

Professor & Head

Dept. of Textile Engineering

Daffodil International University

INDUSTRIAL SUPERVISOR

Engr. Manjur Ahmed Majumder

Deputy General Manager

TALHA FABRICS LTD.

PREPARED BY

Subrata Majumder ID: 092-23-1466

Sajib Kumar Das ID: 092-23-1485

SPRING ’2013

DEPT. OF TEXTILE ENGINEERING

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DECLARATION

We hereby declare that, this report on industrial attachment has been done by us under the supervision of **Prof. Dr. Md. Mahbubul Haque, Prof. & Head, Department of Textile Engineering, Daffodil International University.** We also declare that neither this report nor any part of this report has been submitted elsewhere for award of any degree or diploma.

Prepared By:

Subrata Majumder **ID: 092-23-1466**

Sajib Kumar Das **ID: 092-23-1485**

Department of Textile Engineering

Daffodil International University

Supervised & Approved By:

Prof. Dr. Md. Mahbubul Haque

Professor & Head,

Department of Textile Engineering

Daffodil International University

ACKNOWLEDGEMENT

At first, prayer to the Almighty Allah, the creator and sustainer, who has given us strength, blessing, mental power and opportunity to live on this beautiful earth and as well as to complete the internship.

This internship report is not the result of individual effort. It is a combined result of wonderful team-work, which is accomplished under the guidance, generous assistance, constructive criticism and enlightened supervision of our honorable academic supervisor **Prof. Dr. Md. Mahbubul Haque; Prof. & Head; Dept. of Textile Engineering; Daffodil International University.** His efforts towards the inculcation of spirit of constant work and the maintenance of professional integrity besides other invaluable words of advice always serve as beacon of light throughout the course. We take this humblest opportunity to our deepest sense of gratitude and thankfulness to him.

We are really thankful to our industrial supervisor **Engr. Manjur Ahmed Majumder; Deputy General Manager; TALHA FABRICS LTD.** He gave us the approval for making of that regard and helped us in every manner to fulfill our internship.

A fruitful tree can make its fruit with the help of sunlight, soil, water and many other resources. This Industrial Attachment and its report are perceived as the fruitful result of the joint effort of all concerned with an incredible effort, devotion and hard work. We pay gratitude to the people who have to made significant contributions in preparing this report.

Thankfully

Subrata Majumder
&
Sajib Kumar Das

ABSTRACT

The aim of industrial practice is to make us familiar with any kind of industry, the whole process going on the industry, its environment and also with the management system of the industry. As a student of Textile Engineering Department, the target of any student is to know the production process and the management system. It is because of the fact that, to run any industry not only production department is obvious but also the capability of managing the whole system is an obvious matter. It is also a responsibility of an engineer to develop the ongoing process into a better system to cope with the present competition. Thus a diversified challenge emerges in front of the manufacturer and other organizations. With a view to overcome this consequence a new generation of engineering graduates with leadership skills and management capabilities altogether are in demand.

We the students of Textile Engineering Department were sent to different industries and assigned to different tasks. We were assigned to **TALHA FABRICS LTD. (An Enterprise of NOMAN GROUP).** This report is a presentation of our experience gathered in the weaving mill and also a detailed presentation of our works in that industry.

CONTENT

APPENDIX

TALHA FABRICS LTD.

Industrial training is an integral part of the study for student of Textile Technology. After the final exam of our entire four year study, we have taken this industrial training form **TALHA FABRICS LTD.** Which is a 100% export oriented Woven manufacturing industry in Bangladesh. The industry is concerned with Grey Woven and Color Oriented Fabrics manufacturing. Throughout this eight week long training period we have tried to learn various technical things which are mentioned in this report. This training enabled us to bridge the gap between theoretical & practical knowledge. The incumbents were deputed to **TALHA FABRICS LTD.** for practical industrial training program arranged by our university.

1.1 OBJECTIVE

The main object of our entire training period is to gather as much as practical knowledge on various textile processes related with the industry. During the training period we have tried to meet the gap between theoretical and practical knowledge. As we are the students of Fabric Manufacturing technology, so our main concern was about Warping, Sizing, Weaving, finishing & quality control of Woven fabrics. We have also tried to gather knowledge about machine maintenance and various utility services.

1.2 PLACE OF STUDY

We have performed our industrial training from TALHA FABRICS Ltd. which is located at Vawal, Mirzapur, Gazipur. This is a 100% export oriented Woven factory. They do maintain their quality level up to the mark so this industry was an ideal place for our study.

1.3 DURATION OF STUDY

The total duration of training period was eight weeks.

1.4 METHOD OF STUDY

We attached here as trainee and our study method was Auto instruction.

CHAPTER - 2

Industrial Profile Info

TALHA FABRICS LTD.

2.1 LOCATION MAP

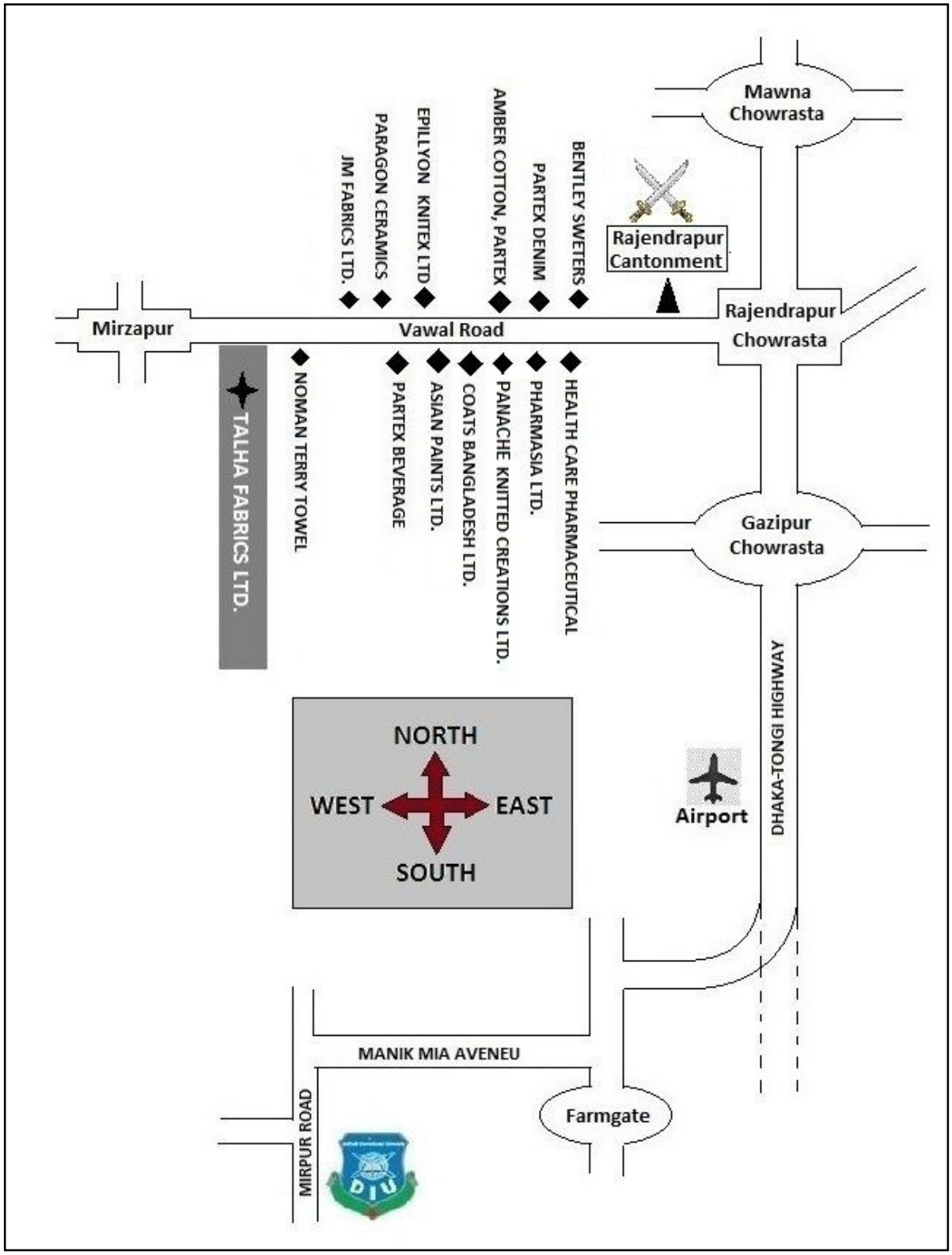


Fig-1: Location map for **TALHA FABRICS LTD.**

2.2 GENERAL INFORMATION ABOUT TFL

o **Name of the Company**	:	**TALHA FABRICS Ltd.** ***(An Enterprise Of Noman group)***
o **Status**	:	Private Ltd. Company
o **Business Type**	:	100% Export Oriented Woven Fabric Manufacturing Industry
o **Address**	:	Vawal, Mirzapur, Gazipur
Head Office (Corporate Office)	:	Adamjee Court (4th&5th Floor), 115-120, Motijheel C/A, Dhaka-1000.
Phone No	:	880-2-7176207-8, 7176348
Fax	:	880-2-9565282, 9564336
E-Mail	:	nomangr@bangla.net
Factory Address	:	Vawal, Mirzapur Road, Mirzapur, Gazipur
Total Land Area	:	54 Bighas
Production Capacity	:	Weaving section/day : 1,06,424 meter Mending section/day : 1,03,421 meter
Total Loom	:	440 (Distributed in 3 sheds)
Date of Incorporation	:	Mar, 2009
Manpower	:	Total Staff : 209 Total Worker : 1257 Security Guard: 69

Table-1: General Information about **TALHA FABRICS LTD.**

2.3 DIFFERENT DEPARTMENTS OF TFL

- ✓ Administrative Department
- ✓ Marketing department
- ✓ Accounts Department
- ✓ R & D Department
- ✓ Production Planning & Control Department
- ✓ Weaving department
    - Warping
    - Sizing
    - Weaving (Loom)
- ✓ Inspection Department
    - Inspection
    - Mending
    - Folding
    - Packaging
- ✓ Quality Control Department
- ✓ Technical Service Department
    - Electrical
    - Mechanical
- ✓ Utility Department
- ✓ Store Department
- ✓ Security Department

2.4 TOTAL STAFFS OF DIFFERENT SECTION

o	Administration Department	:	20
o	Account Department	:	3
o	Store Department	:	20
o	Security Department	:	69
o	R & D	:	10
o	Production loom	:	47
o	Quality section	:	10
o	Mechanical section	:	13
o	Mending Department	:	37
o	Preparatory of sizing & warping	:	30
o	Electrical Department	:	7
o	Utility Department	:	10
o	Workshop Department	:	2

Table-2: Total Manpower of Different Sections in **TALHA FABRICS LTD.**

2.5 PRODUCTS OF TFL

The Industry produces woven fabrics of different design, construction and class in a tremendous amount depending on the requirements of buyers. Of them the following fabrics are important.

- ✓ Plain, (1/1, Rib, Matt etc.)
- ✓ Warp and Weft Way Rib
- ✓ Twill (2/1, 3/1 etc.)
- ✓ Satin (4/1, 5/1)
- ✓ Canvas
- ✓ Shamrey Fabric
- ✓ Herringbone
- ✓ Diamond
- ✓ Broken Herringbone
- ✓ Reed Stop
- ✓ Oxford
- ✓ Queen's Oxford
- ✓ Bird Ford Cord
- ✓ Honey Comb
- ✓ Stripe & Check fabrics of basic & compound design and construction
- ✓ And many more…

2.6 BUYERS OF TFL

- ✓ IKEA
- ✓ H & M
- ✓ SB Cotton
- ✓ Uniline Textiles
- ✓ Altex
- ✓ Ekkelboom, Holland
- ✓ Horrizon
- ✓ Ellos AB, Sweden
- ✓ Bjorna
- ✓ Amanat Shah

2.7 TOTAL LAND AREA

Section	Area
Admin + Mosque	2153 sft
Accommodation	16362 sft
Weaving Shed - 1	115565 sft
Weaving Shed - 2	80732 sft
Weaving Shed - 3	14607 sft
Sizing + Warping	100107 sft
Yarn Storage	18036 Sft
Mending & Folding	17115 sft
Grey Cloth Storage - 1	10334 sft
Grey Cloth Storage - 2	20990 sft
Workshop	3230 sft
Lubricant Storage	2691 sft
Chemical Storage	4036 sft
Boiler Room	3875 sft
Chiller Room	1377 sft
Power House	13175 sft

Table-3: Section-Wise Total Land Area of **TALHA FABRICS**

2.8 TOTAL PRODUCTION CAPACITY

Weaving Shed – 1
No. of Loom : 272
Capacity : 68922 meter/day
⇐ Picanol Loom

Weaving Shed – 2
No. of Loom : 118
Capacity : 28380 meter/day
⇐ Picanol Loom, Toyota Loom, Tsudakoma Loom

Weaving Shed – 3
No. of Loom : 44
Capacity : 9122 meter/day
⇐ Picanol Loom, Tsudakoma Loom

2.9 CERTIFICATION & AWARD

- ✓ ISO 9001:2000 Certified
- ✓ BTMA Awarded

2.10 VISION OF THE GROUP

- ✓ To build a true marketing led enterprise with motivated workforce, innovation vision and more value added product portfolio, customer satisfaction and understanding of global market.
- ✓ To be one of best leading Group in Textile World.
- ✓ Gain market leadership in high value added apparel in USA and Europe.
- ✓ Use "Innovative and Speed" as prime drivers, rather than cotton and cheap labor.

2.11 MISSION OF THE GROUP

Each of the activities of the Enterprise must benefit and add value to the common wealth of our society. The company firmly believes that, in the final analysis we are accountable to each of the constituents with whom the company interacts; namely: their employees, their customers, their business associates, their fellow citizens and their shareholders.

CHAPTER - 3

Manpower Management

TALHA FABRICS LTD.

3.1 GENERAL ORGANOGRAM OF TFL

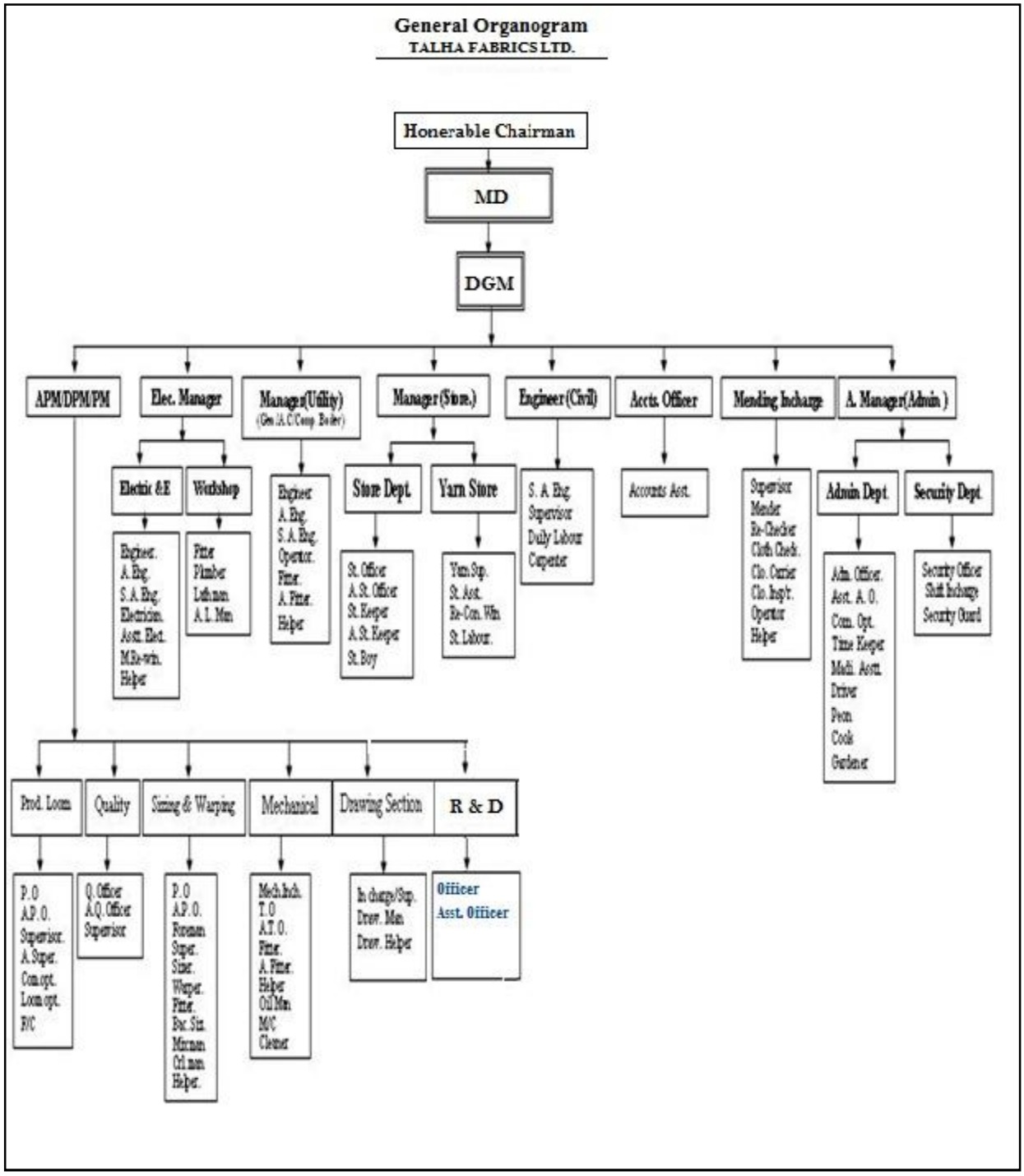


Fig-2: General Organogram of **TALHA FABRICS LTD.**

3.2 LAYOUT PLAN OF THE INDUSTRY

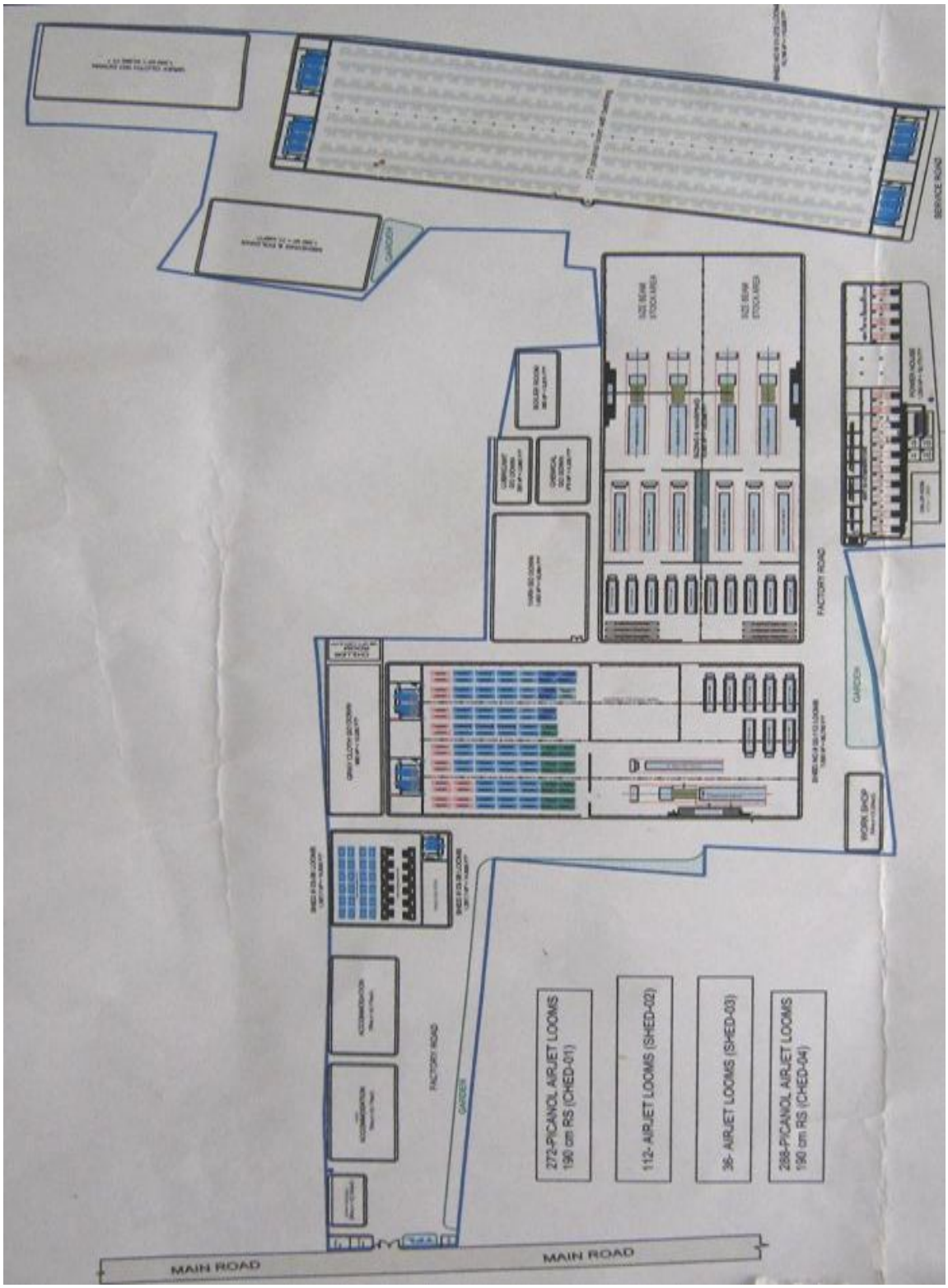


Fig-3: Layout Plan of **TALHA FABRICS LTD.**

3.3 TOTAL MANPOWER

	Officer/ staff	Worker	Security Guard
Male	206	877	67
Female	03	380	02
Total	209	1257	69

Table-4: Total Manpower in **TFL**

Total Manpower in factory: 1129

3.4 SHIFT CHANGE

There are three shifts per day in **TALHA FABRICS LTD.**, each shift consisting of eight hours. There is a general shift too, which is applicable for some officers and staffs only.

Shift	Duration
A	06.00 AM – 02.00 PM
B	02.00 PM – 10.00 PM
C	10.00 PM – 06.00 AM
General shift	09.00 AM – 06.00 PM

Table-5: Schedule for Different Shifts Available in **TFL**

3.5 MANAGEMENT INFO SYSTEM

- ✓ Intercom telephone
- ✓ Fax
- ✓ E-mail
- ✓ Written letters
- ✓ Oral

3.6 JOB DESCRIPTION

Production Manager:

- ✓ To supervise the personal working under him
- ✓ Making costing sheet for a sample
- ✓ To plan for the sequence of production
- ✓ To arrange necessary raw material for the production problems
- ✓ To find out the possible reasons which are responsible for less production
- ✓ To follow up the instruction of Managing Director and GM as well

Production officer:

- ✓ To collect the necessary information and instruction from the previous shift for the smooth running of the section.
- ✓ To make the junior officer understand how to operate the whole production process.
- ✓ To match production sample with target shade.
- ✓ To discuss with PM overall production if necessary.
- ✓ To execute the overall floor work.
- ✓ To maintain tying / knotting of loom.
- ✓ Any other assignment given by the authority.
- ✓ Maintain environment of the weaving floor.
- ✓ Daily production report submitted to higher authority.

Senior Production Officer:

- ✓ Overall supervision of production.
- ✓ To discuss with GM & PM overall production if necessary.
- ✓ Communication with warping & sizing officer for timely production.
- ✓ Checking the production sample according to the buyer sample.
- ✓ Control the PO, supervisor, operator, asst. operator and feeder worker.
- ✓ Utilization of manpower.

CHAPTER - 4

Raw Material

TALHA FABRICS LTD.

4.1 USEABLE YARN COUNT AND CORRESPONDING PRICE

Yarn Count	Combed Yarn	Carded Yarn
40/1	3.65 $/Kg	2.65-2.7 $/Kg
34/1	3.00 $/Kg	2.5-2.6 $/Kg
32/1	2.90 $/Kg	2.30 $/Kg
30/1	2.70 $/Kg	2.30 $/Kg
28/1	2.70 $/Kg	2.25 $/Kg
26/1	2.65 $/kg	2.25 $/Kg
24/1	2.60 $/Kg	2.25 $/Kg
22/1	2.55 $/Kg	2.20 $/Kg
20/1	2.50 $/Kg	2.15-2.2 $/Kg
16/1	-	2.15 $/Kg
14/1	-	2.15 $/Kg
10/1	-	2.10 $/Kg
7/1	-	2.10 $/Kg

Table-6: Usable Yarn, their Count and Corresponding Price

4.2 SOURCE OF YARN:

- ✓ Zubair Spinning
- ✓ Talha Spinning
- ✓ Yasmin Spinning
- ✓ Sufia Spinning
- ✓ Kader Spinning (Synthetic)
- ✓ AA Spinning (Synthetic)

4.3 FREQUENTLY USED YARN

Type of yarn	Count
Cotton	20^S, 24^S, 26^S, 28^S, 30^S, 32^S, 34^S.
Polyester	75D, 72D,100D
Grey Mélange (C-90% V-10%)	20^S, 24^S, 26^S, 28^S, 30^S, 32^S, 34^S.
PC (65%Polyester & 35% cotton)	20^S, 24^S, 26^S, 28^S, 30^S, 32^S.
CVC	20^S, 24^S, 26^S, 28^S, 30^S, 32^S, 34^S.

Table-7: Type of Yarn usually Used and their Corresponding Count

4.4 SIZE CHEMICALS & PRICE

Name of sizing chemical	Taka per kg
Amisol	58 TK
Penetrose	49 TK
Glysofil soft	152 TK
Acry size	47 TK
TAP	42 TK
Pinitex	198 TK
PVA	206 TK
Quick Solan SPR	145 TK

Table-8: Sizing Chemicals and their Corresponding Price

CHAPTER - 5

Production Capacity & Sequence

TALHA FABRICS LTD.

5.1 PRODUCTION CAPACITY OF TFL

Weaving Shed – 1
No. of Loom : 272
Capacity : 68922 meter/day

← Picanol Loom

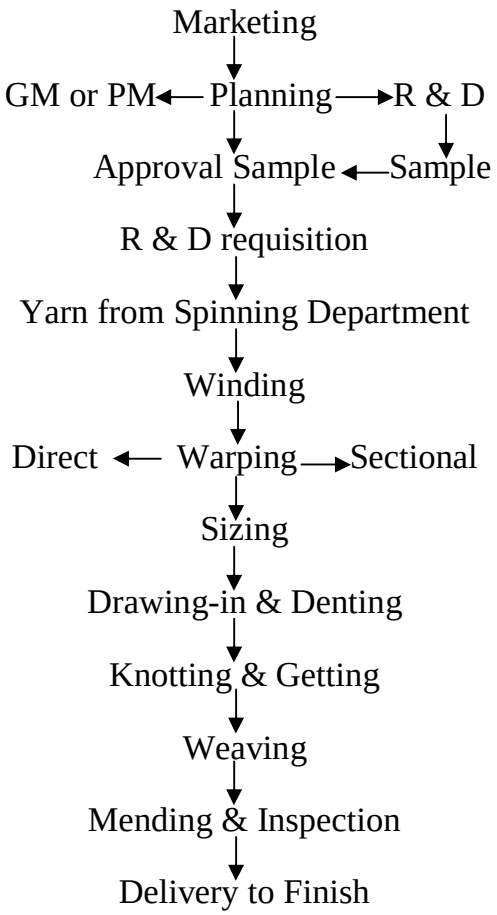
Weaving Shed – 2
No. of Loom : 118
Capacity : 28380 meter/day

← Picanol Loom
Toyota Loom
Tsudakoma Loom

Weaving Shed – 3
No. of Loom : 44
Capacity : 9122 meter/day

← Picanol Loom
Tsudakoma Loom

5.2 FLOW CHART OF OVERALL WEAVING PROCESS



CHAPTER - 6

Winding Section

TALHA FABRICS LTD.

6.1 WINDING PROCESS

Winding is the process of transferring yarn or thread from one type of package to another to facilitate subsequent processing. The re handling of yarn is an integral part of the fiber and textile industries. Not only must the package and the yarn itself be suitable for processing on the next machine in the production process, but also other factors such as packing cases, pressure due to winding tensioned, must be considered.

6.2 OBJECT OF WINDING

- ✓ Make continuous supply of yarn in the subsequent process
- ✓ Bobbin empting operation
- ✓ Removal of thick &thin place ring
- ✓ Removal of weak places of the ring yarn
- ✓ Removal of slubs
- ✓ Removal of knots

6.3 SEQUENCE OF WINDING

Yarn in ring bobbin

↓

Guide

↓

Tension

↓

Yarn clearer device

↓

Stopping device

↓

Traversing guide

↓

Winding

6.4 MACHINE SPECIFICATION

Machine : High speed cone /cheese winding machine

Manufacturer : Shanghai Nanshi Foreign Corporation and Trading Co. Ltd.

Origin : China

Type : Reconing (Hard Winding)

No of the Machine : 02 Pcs.

Model : GA014MD

Capacity : 120 spindle

Motor RPM : 1400

Fig – 4: Reconing Machine available in TFL

6.5 WINDING CALCULATION

Winding rate = Drum Rpm x 3.1416 x Drum Dia. in inch x No. of Spindle

= 1400 x 3.1416 x 3" x 120

= 1583366.4 inch/min

= (1583366.4/39.37) x 60 m/hr

= 2413055.2 m/hr

Volume of Package $= \frac{\pi\pi R^2 h}{4}$

$= \frac{\pi\pi (D-d)^2 h}{4}$

$= \frac{3.1416 \times (15.9 - 3.5)^2 \times 14.5}{4}$

$= 1751.065\ cm^3$

Here,

D = Total Package Dia.

d = Paper Cone Dia.

h = Package Height

Weight of a Package is 1200 gm

Package Hardness = weight / volume

= 1200 gm/ 1751.065 cm^3

= 0.685 gm/cm^3

Soft package range is 0.350 to .500 gm/cm^3

Hard package range is 0.550 to .700 gm/cm^3

Breakage Rate per Lakh Meter

Single Yarn = 8 times

Double yarn = 6 times

6.6 DEFECTS OF WINDING

- ✓ Formation of patches on the yarn.
- ✓ Incorrect winding speed.
- ✓ Tension variation.
- ✓ Dirty package
- ✓ Incorrect shape of the package
- ✓ Piecing up.
- ✓ Too much knots in the yarn.
- ✓ Greasy & dirty yarn.
- ✓ Excessive full bobbin.
- ✓ Poor yarn clearing & snarling.
- ✓ Marking of yarns of different liner density.

CHAPTER - 7

Warping Section

TALHA FABRICS LTD.

7.1 WARPING

The warping consists of collecting predetermined number of ends from a set of wound package and transferring them in a sheet form to a weavers beam. The parallel winding of warp ends small package (bobbin) to a common package (warp beam) is called warping.

Or, the operation of winding warp yarns to a beam usually in preparation for sizing, weaving or warp knitting is called warping.

7.2 OBJECTIVES OF WARPING

- ✓ To produce the warp beam for subsequent process.
- ✓ To contract a parallel yarn sheet of specified length & width.
- ✓ Winding the predetermined length of yarn.
- ✓ The entire yarn in the warp beam should be uniformly tensioned.
- ✓ Modified the fault of yarn.

7.3 TYPES OF WARPING

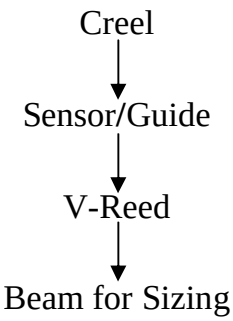
- Beam/Direct Warping (Preparatory beam warping)
- Sectional Warping (Conical drum or dresser warping)

7.4 DIRECT/HIGH SPEED WARPING DETAILS

Direct warping is used for long run of grey fabrics & simple where the amount of colored Yarn involved is less than about 15% of the total yarn.

The latest beam warping machines have a very simple design, which results in higher speed and consequently in output increase.

7.4.1 FLOW CHART FOR DIRECT WARPING



7.4.2 FEATURES OF DIRECT WARPING

- ✓ It is used to make common fabrics in large quantities
- ✓ It is used to produce weavers beam from single yarn
- ✓ The production is high
- ✓ Large amount of yarn is required to produce a weavers beam
- ✓ Simple flanged beam is used and drums are not required

7.4.3 MACHINE SPECIFICATION

M/C No. ⟶	**01, 02, 04, 06**	**05**	**07, 08, 09, 10, 11**
Brand Name	WEST POINT	BENNINGER	MECAY ELLISON
Origin	USA	Switzerland	USA
Creel Capacity	396	396	656
Head Length	1380 mm	1380 mm	1840 mm
Brake	Hydraulic	Hydraulic	Hydraulic
RPM	1400	1400	2300
Drum Pressure Control			
Count		**RPM**	**Drum Pressure (dNa)**
80 s/1		600	180
60 s/1		700	200
30 s/1		800	310~320
40 s/1		800	250

Table – 9: Machine Details of Warping Section in TFL

7.4.4 THE MAIN MACHINE ELEMENTS

- ✓ Creel
- ✓ Creeling Fan
- ✓ Tensioning Device
- ✓ Electronic Sensor
- ✓ Expanding comb
- ✓ Pressure roller
- ✓ Beam.

Fig – 5: Creel behind the Direct Warping Machine available in TFL

7.5 SECTIONAL WARPING DETAILS

In sectional warping equal length of yarn is first wound in small sections or sheets on a drum. Then from the drum it is transferred to the beam. By this process we directly get the weavers beam. This is a two stage method and is used for making fancy fabrics.

7.5.1 FLOW CHART OF SECTIONAL WARPING:

Creel
↓
Drum
↓
Beam (Weaver's Beam)

7.5.2 WORKING PRINCIPLE OF SECTIONAL WARPING:

1. Sectional warping is used for short runs especially for fancy pattern fabrics.
2. In this case sections of the warp which may contain up to 1000 ends are first wound onto a drum tapered with a given cone angle.
3. So cross wound sections are combined on the drum & thus each layer of warp contains the same number of ends on the drum.
4. Then the warp threads altogether are transferred onto a weavers beam by unwinding the drum.
5. In this method the warp threads are not necessarily processed in sizing.

7.5.3 FEATURES OF SECTIONAL WARPING

1. This is suitable for making checked, stripped or other fancy fabric.
2. We directly obtain weaver's beam from this process
3. As sizing is not done, so multi-ply yarns or yarns which do not require sizing are used
4. Small amount of yarn is required to produce the weaver's beam
5. Sectional warping is used to produce a warp beam with a greater member if ends
6. The production is less in sectional warping
7. The yarn tension is less uniform

7.5.4 SCOPE OF SECTIONAL WARPING

- ✓ Stripe fabric
- ✓ Better for sampling
- ✓ Sectional warping is better for without sizing example: for filament sometimes.
- ✓ Sectional warping is better for lower space.

7.5.5 MACHINE SPECIFICATION

Machine No. – 1

Machine Name	: Benninger
Model No	: Supertronic
Manufacture country	: Switzerland
Operating System	: Manual
Creel Capacity	: 560
R.P.M	: 800 max (Used-200-300)
Drum Diameter	: 3m
Working Length	: 3m

Machine No. – 2

Machine Name	: Benninger
Model No	: Bentronic
Manufacture country	: Switzerland
Operating System	: Computerized
Creel Capacity	: 660
R.P.M	: 800 max (used 200-300)
Drum Diameter	: 3m
Working Length	: 2.6m

7.5.6 THE MAIN MACHINE ELEMENTS

- ✓ Creel
- ✓ Creel Stand
- ✓ Creeling Fan
- ✓ Tensioning Device
- ✓ Stop Device/Indicator
- ✓ Feeling Detector
- ✓ Monitoring System
- ✓ Reed (1 & 2)
- ✓ Section width control unit
- ✓ Movable drum
- ✓ Pneumatic pressure unit

Fig – 6: Sectional Warping Machine from the front

7.6 WARPING CALCULATION

Production = Surface speed of drum × π × Dia. of drum × Creel Capacity

Warping calculation related to warp beam preparation is done by the following process.

Construction of a fabric: $\frac{\text{Warp Count x Weft Count}}{\text{EPI x PPI}}$ x Fabric Width(in inch)

Total no of ends = EPI x Fabric Width

Creel capacity = Total number of ends/number of warp beam required

No. of warp beam = Total ends/creel capacity

Ends per beam = Total no of ends/no. of warp beam

7.6.1 A TYPICAL CALCULATION FOR DIRECT WARPING

Suppose, construction of a fabric is $\frac{\mathbf{40\ x\ 40}}{\mathbf{100\ x\ 90}}$ **x 116"**

Total no. of ends = EPI x fabric width

= 100 x 116

= 11600

No. of warp beam = Total no of ends /creel capacity

= 11600/580 (Creel Capacity is available up to 656)

= 20

The no. of cone available in a packet is 24 & total weight of the packet is 100 lbs.

Now 1 cone weight = 100/24

= 4.16 lbs.

= 4.16/0.04 kg

= 1.88 kg

Now 1 cone length = Warp Count x Cone wt. in lbs x 840

= 40 x 4.16 x 840

= 139776 yds

= 139776/1.0936 m

= 127812.73 m

Length Variation = 127812.73 m x 5% (If length variation is 5%)

= 6390.64 m

So, yarn length in 1 cone = Calculated length – length variation

=127812.73 m – 6390.64 m

= 121422.90 m

Length of yarn per warp beam = Total length in 1 cone/no of warp beam

= 121422.90/20

= 6071 m

Now this length will be fixed in warping machine & each time the warp sheet will be cut off after reaching the fixed length wound on the beam. In this way warp beams will be wound continuously. Then it goes to sizing section.

Production = Surface speed of drum × π × Dia. of drum × Creel Capacity

= 20.65 × 3.1416 × 30” × 580

= 1128808.3 inch/ min

= (1128808.3/39.37) × 60 m/hr

= 1720307.3 m/hr

7.6.2 A TYPICAL CALCULATION FOR SECTIONAL WARPING

Available Creel capacity = 560

Total no. of ends per pattern = 42

So, no. of pattern per section = Creel Capacity/Total ends in pattern

= 560 / 42

= 13.33

≈12 pattern (As required)

Creel to be used = Total pattern x Total ends in pattern

= 12 x 42

= 504

Total section = Total Ends / Creel used

= 7000 / 504

= 14 sections

Production = Surface speed of drum × π × Dia. of drum × Creel Capacity

= 20.65 × 3.1416 × 30” × 504

= 980895.48 inch/ min

= (980895.48/39.37) × 60 m/hr

= 1494887.7 m/hr

CHAPTER - 8

Sizing Section

TALHA FABRICS LTD.

8.1 SIZING PROCESS

The weaving process requires the warp yarn to be strong, smooth and elastic or extensible to a certain degree. To achieve these properties on the warp yarns, a protective coating of a polymeric film forming agent (size) is applied to the warp yarns prior to weaving. This is called sizing or slashing. Sizing is the process of applying protective adhesive coating on the yarn surface. This is the most important segment of weaving preparatory process. Because, sizing has direct influence on the weaving efficiency. Better the quality of sizing higher the weaving efficiency & vice versa. In fact without sizing, in most of the cases it is almost impossible to run the weaving process.

8.2 MAIN PURPOSES OF WARP SIZING

- ✓ To increase the strength of the yarns
- ✓ To reduce the yarn hairiness that would cause problems in weaving process
- ✓ To increase the abrasion resistance of the yarn against other yarns and various weaving machine elements
- ✓ To reduce fluff and fly during the weaving machine process for high speed weaving machines.
- ✓ To decrease the generation of static electricity
- ✓ To increase smoothness of yarn
- ✓ To increase yarn elasticity

8.3 IMPORTANT MACHINE PARTS

- ✓ Warp beam.
- ✓ Guide Roller.
- ✓ Tension Roller.
- ✓ Draw Roller.
- ✓ Size box.
- ✓ Immersion roller.
- ✓ Squeezing roller.
- ✓ Small cylinder.
- ✓ Big cylinder.
- ✓ Ribbed roller.
- ✓ Delivery roller.
- ✓ Emulsifying unit.
- ✓ Lease rod.
- ✓ Reed.
- ✓ Measuring roller.
- ✓ Delivery roller.
- ✓ Spreading roller.
- ✓ Weavers beam.

Fig – 7: Sizing Machine from the front and the back

8.4 MACHINE SPECIFICATION

Machine No. – 1
M/C Name: West Point Sizing Machine
Head Length: 2.4 meter
Size Box r/r Length: 1530mm, 1330 mm
Steam Cylinder: 14 Pcs
Creel Capacity: 24 Beams

Machine No. – 2
M/C Name: West Point Sizing Machine
Head Length: 2.4 meter
Size Box Padder Roller Length: 1330 mm
Steam Cylinder: 14 Pcs
Creel Capacity: 24 Beams

Machine No. – 3
M/C Name: West Point Sizing Machine
Head Length: 4.5 meter
Size Box r/r Length: 1980mm, 1800mm
Steam Cylinder: 21 Pcs
Creel Capacity: 20 Beams

Machine No. – 4
M/C Name: West Point Sizing Machine
Head Length: 4.5 meter
Size Box Roller Length: 1980mm
Steam Cylinder: 28 Pcs
Creel Capacity: 24 Beams

Machine No. – 5
M/C Name: SUCKER MULLER Sizing M/C
Head Length: 3.7 meter
Size Box Roller Length: 2200 mm
Steam Cylinder: 08 Pcs
Creel Capacity: 12 Beams

Machine No. – 6, 7
M/C Name: I. R. GRIFFIN Sizing Machine
Head Length: 2.7 meter
Size Box r/r Length: 2000, 1800 mm
Steam Cylinder: 24 Pcs
Creel Capacity: 24 Beams

Machine No. – 8
M/C Name: SUCKER MULLER Sizing M/C
Head Length: 4.54 meter
Size Box Roller Length: 1800 mm
Steam Cylinder: 20 Pcs
Creel Capacity: 20 Beams

Machine No. – 9
M/C Name: BENNINGER ZELL Sizing M/C
Head Length: 3.9 meter
Size Box Roller Length: 1900 mm
Steam Cylinder: 12 Pcs
Creel Capacity: 24 Beams

8.5 DESCRIPTION OF SIZING PROCESS

8.5.1 FLOW CHART FOR SIZING

Size Cooking
↓
Creeling
↓
Yarn Feeding
↓
Sizing (in show box)
↓
Drying
↓
Leasing
↓
Denting
↓
Empty Beam Feeding & M/C Running
↓
Ends Cutting
↓
Doffing

8.5.2 PROCESS DESCRIPTION

- At first particular amount of water is taken in a tank and add wetting agent to the water along with other size ingredients. Then mixture is boiled at 90°c temperature for 5 min. After 5 min native starch is added to the solution and again boiled the solution for 5 min.
- After preparing the solution, it is transferred to other tank from which solution passes to the sizing bath.

- The sizing box is used to apply the size liquor to the yarn. The warp shed is guided through the solution by means of the immersion roller, and then passed through the squeeze roller where the yarns are pressed to maintain the desired percentage of size material on the yarn. The size box temperature is usually maintained by means of steam pipes and the steam flow is regulated to control the temperature. It is also necessary to control the level of the solution in the size as well as the concentration of size.
- From the squeeze roller the yarn moves to the drying cylinder through the guide roller. There are several drying cylinder. The yarn sheet moves separately being two parts over these drying cylinders, then the yarn sheet which comes from two separate beam line meet together and move over rest 4 cylinders. Then lease rods separate the yarns attachment and finally the yarn wound over weaver's beam.

8.6 USEABLE SIZING AGENT AND THEIR PRICE

Name of sizing chemical	Taka per kg
Amisol	58 TK
Penetrose	49 TK
Glysofil soft	152 TK
Acry size	47 TK
TAP	42 TK
Pinitex	198 TK
PVA	206 TK
Quick Solan SPR	145 TK

Table – 10: Size materials and their price

8.7 TYPICAL SIZE RECIPE

Case – 1: Construction: $\frac{30\times30}{72\times42} \times 64"$

Fiber composition:	PC
Weave:	Plain
Total ends:	4580
Warp length:	12000 yds
Size:	18.6%
Squeezing pressure:	8 KN
Pick up:	9%
Dry temperature:	150^0 C
Moisture:	6.5%
Modified Starch (Penetrose):	(60 + 48) kg
Tapioca Starch:	(10 + 8) kg
Wetting agent (PVA):	(8 + 6) kg
Size wax (Pinitex):	(3 + 2) kg
Binder (Acrysize):	(12 + 9) kg
Water:	(500 + 40) ltr.

Case – 2: Construction: $\frac{10\times10}{68\times40} \times 61"$

Fiber composition:	100% Cotton
Weave:	Plain
Total ends:	4150
Warp length:	500 yds
Size:	16.7%
Squeezing pressure:	7 KN
Pick up:	8%
Dry temperature:	130^0 C
Moisture:	6.5%
Modified Starch (Penetrose):	38 kg
Tapioca Starch:	7 kg
Wetting agent (PVA):	4 kg
Size wax (Pinitex):	2.5 kg
Binder (Acrysize):	7 kg
Water:	350 ltr.

Case – 3: Construction: $\frac{40\times40}{104\times72} \times 61"$

Fiber composition:	100% Cotton
Weave:	4/1 Satin
Total ends:	6280
Warp length:	11800 yds
Beam space:	65”
Size:	21.2%
Squeezing pressure:	8 KN
Pick up:	13%
Dry temperature:	150^0 C
Moisture:	6.5%
Modified Starch (Penetrose):	(75 + 60) kg
Wetting agent (PVA):	(12 + 10) kg
Size wax (Pinitex):	(5 + 4) kg
Binder (Acrysize):	(14 + 11) kg
Water:	(500 + 400) ltr.

Case – 4: Construction: $\frac{30\times20}{140\times80} \times 61"$

Fiber composition:	100% Cotton
Weave:	Canvas
Total ends:	8500
Warp length:	8000 yds
Beam space:	65”
Size:	24.6%
Squeezing pressure:	8 KN
Pick up:	12%
Dry temperature:	150^0 C
Moisture:	6.5%
Modified Starch (Penetrose):	(85 + 68) kg
Wetting agent (PVA):	(14 + 12) kg
Size wax (Pinitex):	(6 + 4.5) kg
Binder (Acrysize):	(18 + 13) kg
Water:	(500 + 400) ltr.

Case – 5: Construction: $\frac{40\times40}{141\times96} \times 61"$

Fiber composition:	100% Cotton
Weave:	4/1 Satin
Total ends:	8500
Warp length:	10200 yds
Beam space:	65”
Size:	18.6%
Squeezing pressure:	8 KN
Pick up:	14%
Dry temperature:	150^0 C
Moisture:	6.5%
Modified Starch (Penetrose):	(85 + 68) Kg
Wetting agent (PVA):	(14 + 11.5) Kg
Size wax (Pinitex):	(5 + 4) Kg
Binder (Acrysize):	(16 + 13) Kg
Water:	(500 + 400) ltr.

Case – 6: Construction: $\frac{30\times12}{148\times68} \times 61"$

Fiber composition:	100% Cotton
Weave:	Poplin
Total ends:	9000
Warp length:	3450 yds
Beam space:	65”
Size:	24%
Squeezing pressure:	8 KN
Pick up:	14%
Dry temperature:	150^0 C
Moisture:	6.5%
Modified Starch (Penetrose):	85 Kg
Wetting agent (PVA):	14 Kg
Size wax (Pinitex):	5 Kg
Binder (Acrysize):	16 Kg
Water:	500 ltr.

Case – 7: Construction: $\frac{16\times10}{102\times54} \times 61"$

Fiber composition:	100% Cotton
Weave:	3/1 Twill
Total ends:	6120
Warp length:	2000 yds
Beam space:	65”
Size:	14%
Squeezing pressure:	8 KN
Pick up:	10%
Dry temperature:	150^0 C
Moisture:	6.5%
Modified Starch (Penetrose):	50 Kg
Tapioca Starch:	7 Kg
Size wax (Pinitex):	4 Kg
Binder (Acrysize):	9 Kg
Water:	500 ltr.

Case – 8: Construction: $\frac{30\times30}{122\times70} \times 61"$

Fiber composition:	100% Cotton
Weave:	Canvas
Total ends:	7450
Warp length:	15500 yds
Beam space:	65”
Size:	23.8%
Squeezing pressure:	8 KN
Pick up:	10%
Dry temperature:	150^0 C
Moisture:	6.5%
Modified Starch (Penetrose):	255 Kg
Wetting agent (PVA):	42 Kg
Size wax (Pinitex):	15 Kg
Binder (Acrysize):	45 Kg
Water:	1500 ltr.

8.8 SIZING CALCULATION:

Size Beam Width, $X = \frac{Total\ ends}{Ends/inch}$

Production = RPM of measuring roller × π × Dia. of measuring roller × total capacity

= 53.2 × 3.14 × 9" × 5800

= 2706177.6 inch/min

= 75171.6 yds/min

= 89.49 hanks/min

= 89.49/30 lbs/min (in case of 30's count)

= 2.98 lbs/min

$$\text{Wt. of yarn (kg)} = \frac{\text{length of warp in yds} \times \text{no of ends}}{\text{count} \times 840 \times 2.2045}$$

$$\text{Wt. of unsized material in gm} = \frac{\text{total ends} \times \text{length in mtr}}{\text{Nm}}$$

$$\text{Wt. of sized warp (kg)} = \frac{\text{length (sized)} \times \text{no of ends}}{\text{count} \times 840 \times 2.2045}$$

$$\text{Count of sized yarn} = \frac{\text{count of unsized yarn} \times 100}{100 + \text{size\%}}$$

$$\text{Size liquor pick-up\%} = \frac{\text{wt of size liquor (kg)}}{\text{wt of yarn (raw kg)}}$$

8.9 SIZING FAULTS AND THEIR REMEDIES

Fault name	Causes	Remedies
Uneven sizing	Worn out pressure roller. Incorrect size level in size box. Higher viscosity.	Change of grinding pressure roller. Proper level of size in box.
End missing	Weak yarn. Excessive speed.	Tension and speed according to quality.
Joint end	Improper leasing. Improper combing.	Proper leasing. Proper combing
Excessive dried	Low drying speed	Proper speed should be maintained.
Wet warp	High drying speed	Proper speed should be maintained
Pattern breaking	End missing. Improper leasing.	Proper leasing should be controlled
Conical beam	Mechanical fault in winding	Repair mechanical fault.
Excessive hard or loose beam	PVI (Pressure Variable Index) not work properly.	Maintenance of the PVI box.

Table – 11: Some Important Sizing Faults and Their Remedies

CHAPTER - 9

Weaving Section

TALHA FABRICS LTD.

9.1 PREPARATION OF WEAVING

To obtain satisfactory weaving performance, it is essential to have not only a correct yarn preparation, but also an efficient organization which permits to have warps available at the right moment, thus avoiding any dead time with style or beam change. All these prerequisites aim at ensuring to the weaving mills a sufficient flexibility and at permitting them to cope promptly with a variable market demand.

The following chart presents the possible alternatives for the preparation of the weaving machine:

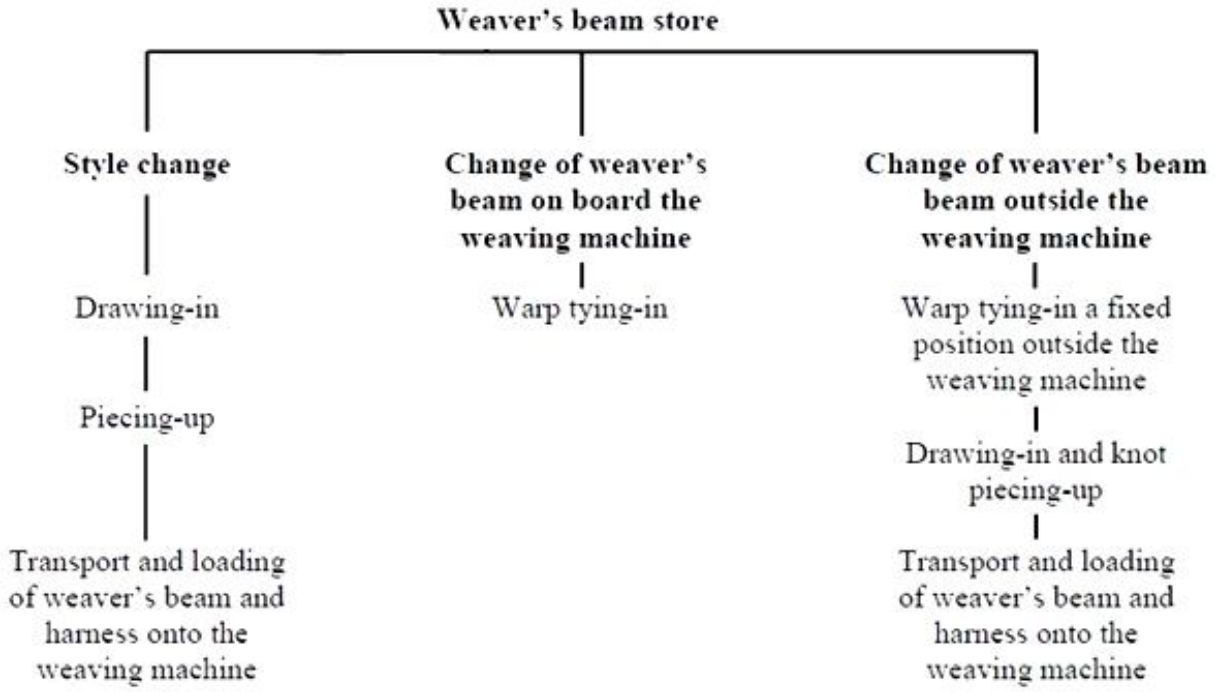


Fig – 8: Possible alternatives for the preparation of the weaving

Changing style means producing a new fabric style, **weaver's beam changing** means going with the onweaving the same fabric style just replacing the empty beam with a full beam of same type.

Drawing-in consists of threading the warp yarns through the drop wires, the healds and the reed.

During slashing the number of warp yarns required in the fabric is wound on to the weaver's beam. The warp ends are then passed through the "drop wires" of the warp stop motion, "heald eye" of heald frame and "dent" of the reed. This can be achieved either by drawing-in or tying in, the choice depending upon whether or not the new warp is different from the warp already on the loom

9.1.1 MANUAL DRAWING – IN

The weaver's beam is taken to the drawing-in area. There are frame on which the drop wires, heald frame and reed are supported in the order in which they are found on the loom.

A length of yarn, just enough to reach to the other side of the frame, is unwound. Leasing of the warp at this stage simplifies separation of yarns. In normal practice, two operators sit facing each other across the frame and the operator facing the reed passes a hooked needle through the heald eye and drop wires. The hook is then exposed to the second operator on the other side of the frame, the reacher-in select the correct yarn in its proper order and put it on the hook, so that when the needles pulled out the yarn threaded through the two loom part. This is known as the drawing-in as required by the denting plan or reed plan.

9.1.2 DENTING

The reed is a comb-like structure consisting of regularly spaced wires. The word dent is commonly used to describe the space between two reed wires.

Denting means drawing the warp ends through the dent as required by reed plan and this determines more accurately the width of the fabric and the ends per cm.

After these operations, the beam is brought to the loom so that it has the required number of heald frames and the reed as well as a multitude of drop wires. The beam in this state is useful only for the particular job at hand and can rarely be used to produce a different fabric structure without re-looming.

9.1.3 PIECING-UP

The warp threads are laid into a uniform layer by the brush roller of the piecing-up machine and successively pieced-up between two plastic sheets respectively about 5 cm and 140 cm wide, both covering the whole warp width. The plastic sheet can be inserted into the weaving machine simply and quickly, avoiding the grouping of threads together into bundles. The threads are then pieced-up on the tying cloth of the take-up roller.

9.1.4 KNOTTING

The automatic knotting machines can process a wide range of yarn types and counts at highly reliable and rapid operating conditions (up to 600 knots/minute), with mechanical or electronic control on double knots and on the sequence of warp patterns in case of multi-colored warps. Fig. 33 shows a knotting machine in operation on a warp with color sequence, tensioned on the proper frame.

9.1.5 GAIT-UP THE LOOM

- ✓ Warp beam should be accurately fitted in to the brackets
- ✓ All the heald shafts should be joined with the shedding device (rollers/pulleys/jacks etc) so that their tops are in a straight line horizontally
- ✓ Reed should be properly fitted to the grooves (sley groove and reed cap groove)
- ✓ The bottom and the top of the reed should completely sink in to the grooves in horizontal position
- ✓ The reed grooves and reed cap grooves should not be too wide or too narrow. Otherwise it will bend to either side
- ✓ Discard the use of too old, damaged or rusted reed.

9.1.6 TIE-UP THE LOOM

- ✓ Each section of the warp should be parallel and with equal tension
- ✓ Each section should tie-up just parallel to the reed to the cloth beam
- ✓ In lieu of the section-tying rod, apron should be used
- ✓ According to the design pattern, required number of paddles should be accurately fitted at the middle of the loom width
- ✓ Required number of lamb rods should be accurately fitted below parallel to the heald frames
- ✓ All connections (with the paddles, lamb rod and shedding device) should be accurately tied up
- ✓ Everywhere, only slipknots should be used.

9.1.7 EQUIPMENTS USED IN WEAVING PREPARATORY SEQUENCES

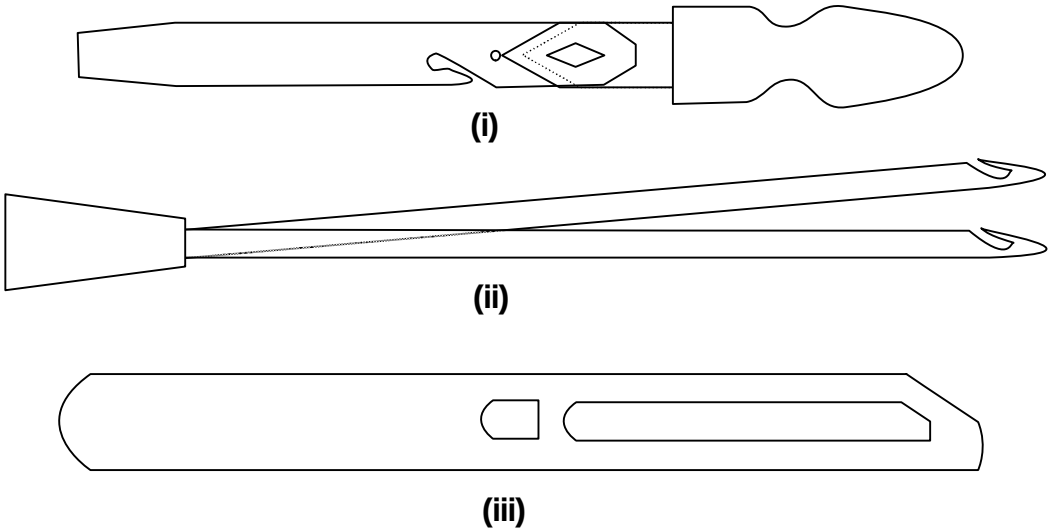


Fig – 9: (i) Denting plate (Patti), (ii) Drawing Hook, (iii) Drop Wire

9.2 PROCESS FLOW CHART OF WEAVING

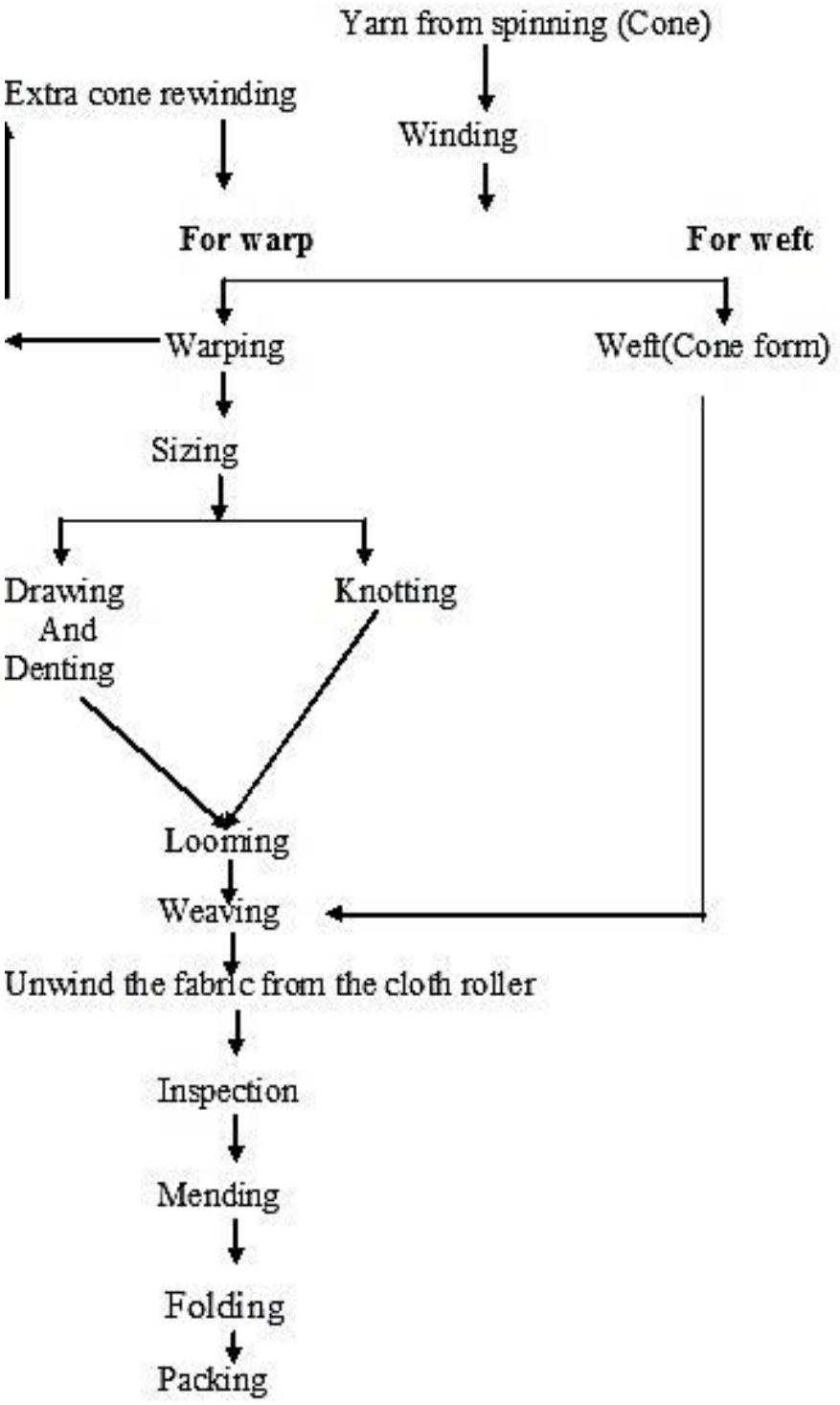
9.2.1 WARP WISE YARN PATH

Weavers beam
↓
Back rest roller
↓
Feeler roller
↓
Warp stop motion or drop wire
↓
Heald Eye
↓
Reed
↓
Take Up Roller

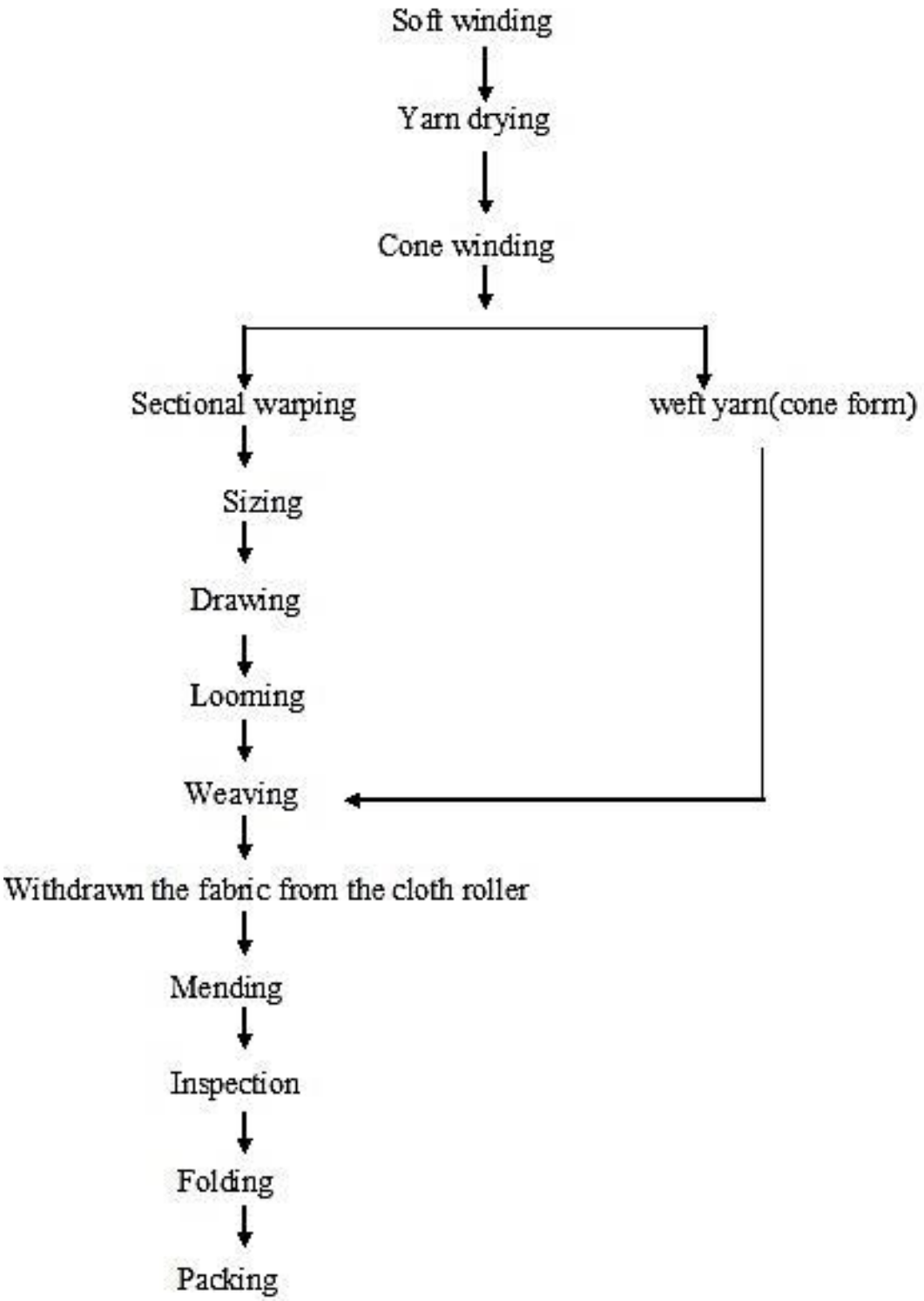
9.2.2 WEFT WISE YARN PATH

Bobbin Creel
↓
Pre Winder
↓
Programmable Filling Tensioner (P F T)
↓
Fixed Nozzle
↓
Movable Nozzle
↓
Filling Cutter
↓
Relay Nozzle
↓
Filling Detector
↓
Stress Nozzle
↓
Waste Cutter

9.2.3 SEQUENCE OF OPERATION (GRAY YARN)



9.2.4 SEQUENCE OF OPERATION (DYED YARN)



9.3 MACHINE DETAILS

9.3.1 LOOM SPECIFICATION

	SL	Loom Name	Model	Loom Type	Selvedge	Loom width	Total Loom
Shed – 1	01	Picanol	Omni	Tappet	Close	190 cm	62
	02	Picanol	Omni	Tappet	Lino	190 cm	42
	03	Picanol	Omni	Dobby	Lino	280 cm	74
	04	Picanol	Pat	Tappet	Lino	190 cm	38
	05	Picanol	Pat	Dobby	Lino	280 cm	56
							Total = 272
Shed – 2	01	Tsudakoma	Zex	Tappet	Close	340 cm	20
	02	Tsudakoma	Zex	Tappet	Close	330 cm	44
	03	Toyota	610	Tappet	Lino	330 cm	14
	04	Toyota	610	Tappet	Lino	280 cm	4
	05	Toyota	500	Tappet	Lino	280 cm	2
	06	Picanol	Omni	Tappet	Lino	190 cm	2
	07	Picanol	Omni	Tappet	Lino	280 cm	4
	08	Picanol	Omni	Tappet	Close	280 cm	4
	09	Tsudakoma	Zex	Tappet	Lino	190 cm	18
	10	Toyota	500	Tappet	Lino	190 cm	6
	11	Tsudakoma	Zex	Dobby	Lino	190 cm	4
							Total = 122
Shed – 3	01	Picanol	Pat	Dobby	Lino	190	8
	02	Tsudakoma	209i	Tappet	Lino	190	8
	03	Picanol	Pat	Tappet	Lino	190	8
	04	Picanol	Pat	Tappet	Lino	280	10
	05	Picanol	Pat	Tappet	Lino	280	8
	06	Picanol	Omni	Tappet	Lino	190	4
							Total = 46

Table – 12: Detailed loom specification of the all three weaving sheds in TFL

9.3.2 MAIN PARTS

- ✓ EDP (Electronic Drum Pre-winder)
- ✓ Tappet (Cam)
- ✓ Lever and Puller
- ✓ Reed
- ✓ Dobby
- ✓ Easing roller
- ✓ Back rest
- ✓ Take up roller
- ✓ Cloth roller
- ✓ Weft Feeler
- ✓ Dummy selvedge stop
- ✓ Weft cutter
- ✓ Drop wire and bar
- ✓ Leno selvedge attachment
- ✓ Main nozzle
- ✓ Sub nozzle
- ✓ Tample
- ✓ Dummy selvedge system
- ✓ Monitor and Mother board
- ✓ Pressure control Switch
- ✓ Grease tank
- ✓ Production per hr = $\frac{Machine\ RPM \times 60 \times efficiency}{PPI \times 36}$ yds/hr

Fig – 10: Weaving Floor and Consequences

9.3.3 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

9.3.3 MACHINE MOTOR

- ✓ Main Motor / Sumo Motor / DC Motor
- ✓ Let off Motor
- ✓ Take Up Motor
- ✓ Electric Rotary Leno Motor
- ✓ Leveling Motor
- ✓ Selvedge Motor
- ✓ ALCA Motor

9.4 MAINTENANCE IN THE WEAVING SECTION

For proper running of the machine it is necessary to maintain the machine. This is done by cleaning the machine on a regular basis. This is basically the servicing of the machine. This is done due to the following reasons:

- ✓ To maintain the quality of the fabric
- ✓ To reduce the fabric fault
- ✓ Removal of dust from the machine
- ✓ Cleaning of different parts of the machine

The mistakes frequently occur in the loom are:

- ✓ A missed heald eye
- ✓ A missed warp yarn
- ✓ Crossed drafted and dented threads
- ✓ Too many yarns either in a heald eye or in a dent reed
- ✓ Missing dents of the reed

CHAPTER - 10

Quality Assurance
(Mending & Folding Section)

TALHA FABRICS LTD.

10.1. QUALITY ASSURANCE & FABRIC INSPECTION

Quality assurance is defined as all those possible planned and systematic actions necessary to provide adequate confidence than a product or service will satisfy given requirements for quality. The Quality Assurance Department is assigned to maintain consistently uniform quality of the material in process and various stages of manufacturing.

10.2 OBJECTIVES OF QUALITY CONTROL

- ✓ Specification test
- ✓ Raw material control
- ✓ Process control
- ✓ Process development
- ✓ Product testing
- ✓ Research

10.3 SEQUENCE OF FABRIC INSPECTION

From weaving fabric come to the inspection section

↓

Mending

↓

Line check

↓

Re check

↓

Folding

↓

Fabric Send to the ware house according to the construction & fabric width

↓

Then delivery to dyeing

10.4 QUALITY STANDARD

Talha Fabrics Ltd. Follows the four point grading system to inspect the body of the fabric. According to four point system, the faults are found by inspection and are given points against the fault. Then the total no. is calculated. The following table shows the penalty points to the corresponding defects followed by four point system.

Four Point Grading System	
Size of defects	**Penalty Points**
3 inches or less	1
Over 3 inch but not over 6 inch	2
Over 6 inch but not over 9 inch	3
Over 9 inch	4
For any hole in the fabric	4

Table – 13: Penalty points to the corresponding defects followed by TFL

Calculation of points is done by-

$$\frac{Actual\ Point \times 100}{Inspected\ Total\ Yard} = \text{Actual Point Grade}$$

10.5 INSPECTION PROCEDURE

As the fabric is produced by the Air jet loom it is then collected by the quality inspector and the fabric is thoroughly inspected in front of a white light board. During this inspection the holes, oil marks, reed marks, loom bar, temple mark, double end, double pick, tight warp, loose warp, faulty denting, faulty drawing are checked. If the fabric is within the acceptance level (by the four point system) then it is sent to the garments section for further treatment. The overall procedure is explained below.

- ✓ Store in charge will check the received fabric with the report length and type of fabric with the stated shipment document quantity and the actual order quantity.
- ✓ The finding will be recorder in inventory report and discrepancy regarding fabric type, color and length will be notified to the AGM/ASTT. Manager.
- ✓ For in-house products quality control officer will guide all over inspection.
- ✓ Quality inspector (fabric) shall check 100% receive fabric for quality. He will identify any defect, hole or stain in the fabric and make calculating given below-
- ✓ If point grade is 40 or below then the fabric is ok. If the result is more than 40 points, then inform it to AGM or respective merchandiser

- ✓ The fabric is also checked for shading defect in side by side and length. Any non-conformities/ shading will be notified to asst. manager using inspected reports. Roll wise color uniformly card is maintained for identification of shade variations.
- ✓ During the fabric inspection if the yardage of any roll is reported more or less by the fabric inspection machine then the one specified in the roll, the roll will be measured manually using measuring tapes. Only calibrated measuring tape should be used.

The result of fabric inspection shall be recorded in fabric inspection report

10.6 DEFECTS FOUND IN THE INSPECTION

No.	Faults	Reason
1.	Reed Mark	Uneven warp & weft tension
2.	Miss pick	Uneven weft yarn tension
3.	Snarl	Uneven air pressure
4.	Hole	Uneven knotting
5.	Slubs	Yarn fault
6.	Thick thin place	Uneven tension
7.	Weft contamination	Wrong weft yarn supply
8.	Double end	Wrong denting
9.	Wrong denting	Double end
10.	Double pick	Wrong air tension
11.	Wrong drawing	Operator fault
12.	Loose warp	Wrong beam winding
13.	Tight warp	Wrong beam winding
14.	Oil line/ stain	Carelessness
15.	Chemical	Carelessness
16.	Dirt stain	Carelessness
17.	Crease mark	Carelessness
18.	Uneven tension	Wrong operational set up

Table – 14: Above Table shows common faults and reasons observed in the inspection section at Talha Fabrics Ltd.

10.7 MENDING & FOLDING FLOOR CAPTION

Fig – 11: Mending & Folding Floor of TFL

CHAPTER - 11

Costing & Inventory Control

TALHA FABRICS LTD.

11.1 A TYPICAL COSTING CALCULATION

Construction: $\frac{16\times10}{96\times48}$ ×61”

Total Ends: 5900

Overall Allowance: 14%

Warp Yarn price = 170 TK/kg

Weft Yarn price = 165 TK/kg

Factory pick cost = 0.03 TK

$$\text{Warp Wt/yd} = \frac{\text{total ends x length of each ends x 453.6}}{\text{count x 840 x 0.9144}} \text{ x (1 + Allowance \%)}$$

$$= \frac{5900 \text{ x } 1 \text{ yds x } 453.6}{16 \text{ x } 840 \text{ x } 0.9144} \text{ x (1 + 14 \%)}$$

= (217.77 x 1.14) gm/yd

= 248.25 gm/yd

$$\text{Weft Wt/yd} = \frac{\text{Reed width} \times \text{PPI} \times 36 \times 453.6}{\text{count} \times 840 \times 0.9144} \text{ x (1 + Wastage\%)}$$

$$= \frac{1.81 \text{ yds} \times 48 \times 36 \times 453.6}{10 \times 840 \times 0.9144} \text{ x (1 + 14\%)}$$ [65” reed = 1.81 yds reed]

= (184.71 x 1.14 gm/yds

= 210.51 gm/yds

Individualized cost

Warp yarn cost/yd = $\frac{248.25 \times 170}{1000}$ = 42.20 TK

Weft yarn cost/yd = $\frac{210.51 \times 165}{1000}$ = 34.73 TK

Weaving cost/yd = (48 x 36 x 0.03) TK

= 51.84 TK

Total cost/yd = (warp yarn cost/yd + weft yarn cost/yd + weaving cost/yd)

= (42.20 + 34.73 + 51.84) TK

= 128.77 TK

11.2 FREQUENCY OF INVENTORY UPDATE

- ✓ Monthly inventory control
- ✓ Annual inventory control

11.3 SCOPE OF INVENTORY CONTROL

- ✓ Raw materials
  - o Yarn
  - o Other chemicals
- ✓ Finished fabric
- ✓ Spare parts
- ✓ General store
  - o Capital equipments
  - o Accessories
  - o Stationary
  - o Maintenance parts

11.4 INVENTORY SYSTEM FOR RAW MATERIALS

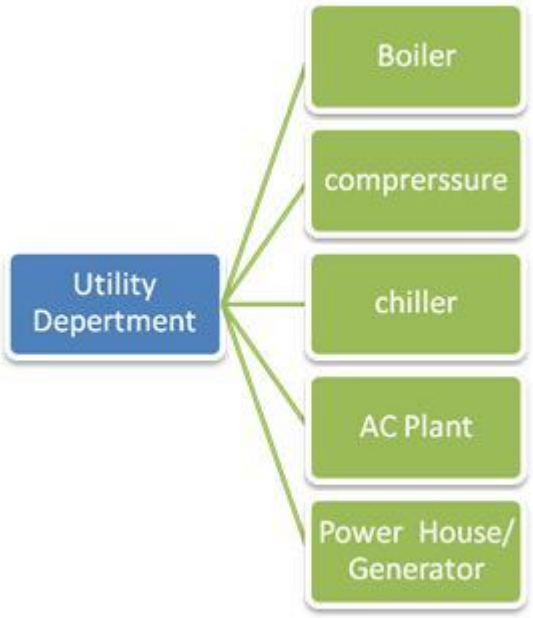
- ✓ Raw materials partially received from production planning & directly from head office
- ✓ Material receiving & inspection report (MRIR) is prepared
- ✓ Received quantity is mentioned and noted down
- ✓ Submitted to Q.C. department
- ✓ Some are OK & few rejected
- ✓ Entry of data of goods in DATATEX
- ✓ Goods are arranged according to OK or rejected group
- ✓ Department gives store requisition to warehouse
- ✓ As per requisition materials supplied & this record are noted down

CHAPTER - 12

Utility Department

TALHA FABRICS LTD.

12.1 UTILITY SERVICES



12.1.1 POWER HOUSE

Total generator: 5

Name of generator: CATEPILLER

Country of origin: Germany

Model of Engine: 3516

Year of manufacture: 2006

Maximum Production capacity per machine: 1030 KW

Useable Production capacity per machine: 750 KW

Total Maximum Production capacity: 5150KW/ 5.15 MW

Useable Production capacity: 3750KW 3.75 KW

Cost per unit: 1.59 Taka

12.1.2 ELECTRICITY

The main utility electricity is supplied form PDB and also by Generator.

12.1.3 GAS

Gas is mainly used for steam production.

The gas is used from TITAS GAS LTD.

Generally 36 m3 gas is required to produce 1 ton steam.

12.1.4 WATER

Depth of pump: 140 ft

Mainly two pumps are used for water pick up

Submersible pump-I	Capacity: 260 m^3/hr	Discharge value: 100% open
Submersible pump-II	Capacity: 204 m^3/hr	Discharge value: 100% open

12.1.5 BOILER

- ✓ Pure steam with required temperature must be produced to meet the continuous demand of steam in different sections
- ✓ Fire tube type boiler is used
- ✓ 1 boiler is operated by using burnt gas
- ✓ 2 boilers is operated by Titas gas
- ✓ 3 Pass heating system
- ✓ Measuring meter for water supply
- ✓ 4” depth greasol insulation so no heat at outside of drum
- ✓ The lower drum is 100% water filled & the top drum is 60% water & 40% steam filled
- ✓ Proper supply of air for gas burnings
- ✓ Every result is recorded for 4 hours.
- ✓ Chemicals used for boiler feed water
- ✓ NaCl solution for regeneration
- ✓ NALCO-4654 (Scale remover)

Boiler Specification

No. of boiler : (4+1) twine boiler

Boiler capacity : 10 ton

Steam pressure : 8.2 bar

Steam flow : 7 ton (app.)

Manufacturer : Thermax; India

Model : TD-100-10-54/6AS/E

Fuel : Natural gas

Water pressure : 10.3 bar

Evaporation : 1000 x 3 kg/hr

Output : 6.28 x 3 MW

Steam Temp. : 185^0C

12.1.6 COMPRESSOR

Natural gas is drawn by pipe through the filter above the compressor & the air is compressed. In such a case the air becomes slightly hot. Hence cold water is drawn to reduce the temperature of compressed air. Thus the cold water becomes slightly hot & goes through outlet pipe to the overhead reservoir. Then the water falls slowly through a compressed air along with some vapors are transferred to the reservoir where the vapors are condensed and outlets drop by drop.

Compressor Specification:

Unloading pressure : 7.5 bar

Pressure difference : 0.6 bar

Oil pressure : 1.2 bar

Motor running time : 15 bar

No. of compressor : (3 + 3)

Capacity : 774 Lt air / compressor /sec

Manufacturer : Atlas Capco.

Mfg. Country : Belgium

Chemicals used in Compressor

- ✓ Shell Turbo – T – 68
- ✓ Grease
- ✓ Nalco 7328 & 7330

12.1.7 Chiller

A chiller plant normally consists of evaporator pumps, chillers, condenser pumps, and cooling towers.

Capacity: 850 RT (ton of Refrigeration)

Chemicals used in Chiller:

- ✓ LiBr (Lithium bromide – Components Li = 7.99%, Br = 92.01%)
- ✓ S.G. (3.46 at 25^0C)
- ✓ MP (549^0C)
- ✓ BP (1265^0C)
- ✓ Lythium Molybodate
- ✓ Octyl Alcohol (2-Ethyl – 1 phenol)
- ✓ Nalco 7328 & 7330
- ✓ Refrigerant

12.2 COSTS OF UTILITY

Electricity cost =1.58 TK Unit

Boiler steam Rate= 5.28 TK per m^3

12.3 TEMPERATURE & RH CONTROL PANEL

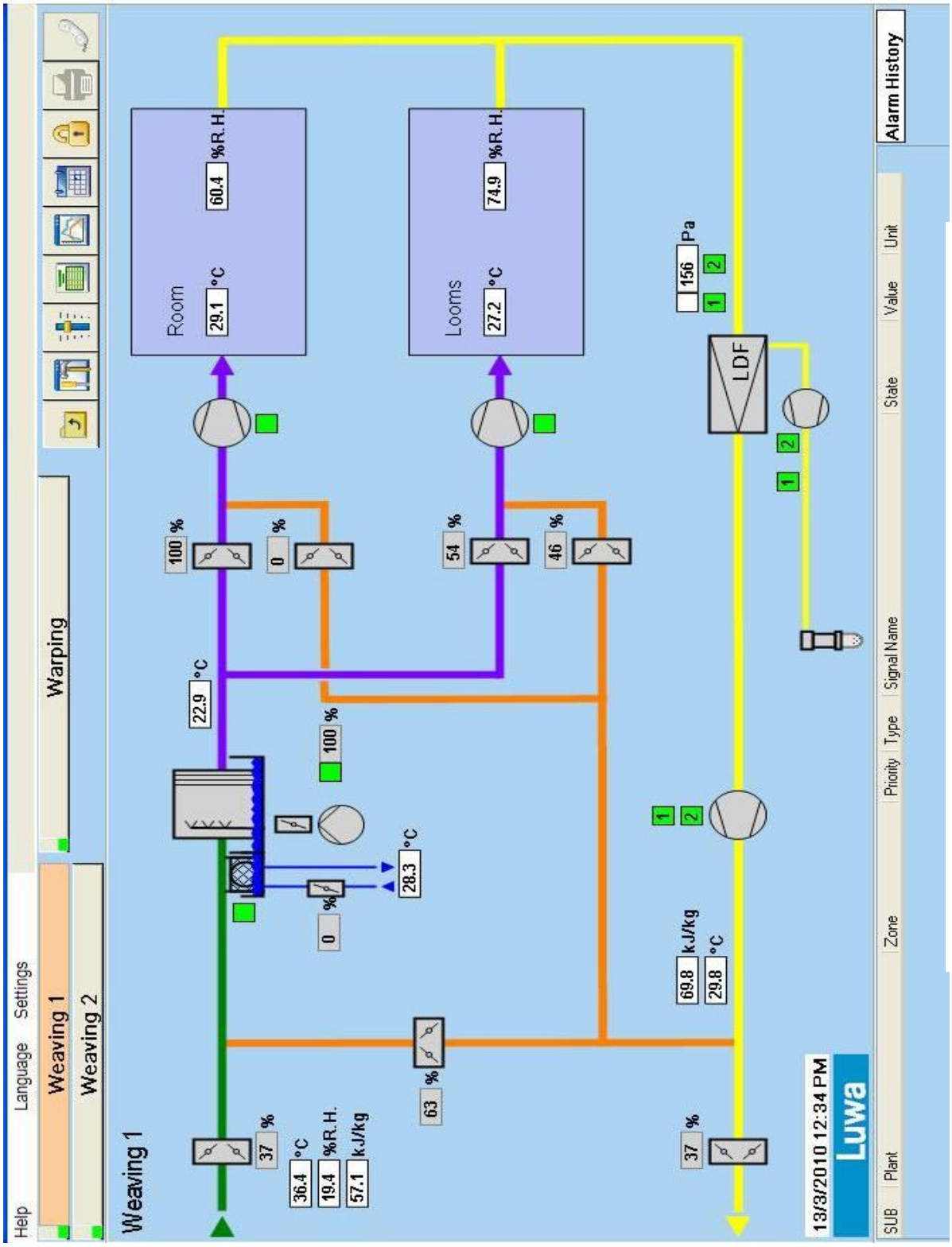


Fig - 12: Temperature& Relative Humidity Control system of warping

CHAPTER - 13

Maintenance Department

TALHA FABRICS LTD.

13.1 MAINTENANCE

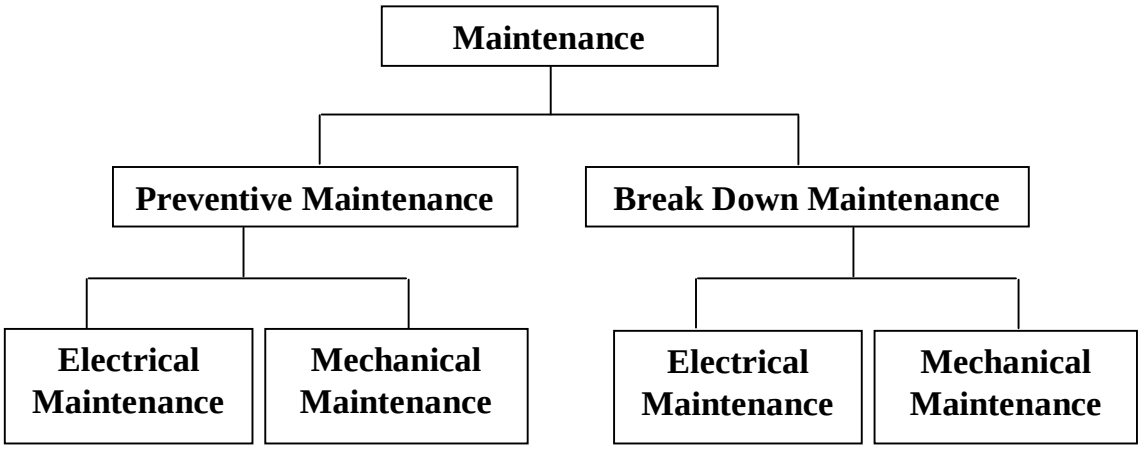
Machine, Building & facilities are subjected to deterioration due to their use & exposure to environmental condition. Process of deterioration, if unchecked, culminates in rendering these service facilities unserviceable & brings them to a standstill. In Industry, therefore has no choice but to attend them from time to time to repair & recondition them so as to elongate their life to extent it is economically & physically possible to do so.

It is in this in the context that maintenance assumes important as an engineering function .It is made responsible for provision of a condition of these machines, buildings, & service that permit uninterrupted implementation of plans requiring their use.

13.2 OBJECTIVES OF MAINTENANCE

- ✓ To keep the factory plants, equipments, machine, tools etc. in an optimum working condition
- ✓ To ensure specified accuracy to product & time schedule of delivery to customer
- ✓ To keep the down time of machines to the minimum thus to have control over the production program
- ✓ To keep the production cycle within the stipulated range
- ✓ To modify the machine tools to meet the need for production

13.3 TYPES OF MAINTENANCE



✓ **Preventive Maintenance:**

Preventive maintenance is a predetermined routine actively to ensure on time inspection/ checking of facilities to uncover conditions that may lead to production break downs or harmful description.

✓ **Breakdown Maintenance:**

In this case, repairs are made after the equipment is out of order and it cannot perform its normal functions.

✓ **Routine Maintenance:**

Maintenance of different machines is prepared by expert engineer of maintenance department. Normally in case of weaving machine maintenance is done after every 7 days for complete checking of different important parts are done.

13.4 MAINTENANCE PROCEDURE

Setting:

Setting is the activities to set or install the machine parts or required ancillaries. Adjustment is also complementary word to setting used for appropriate setting.

Checking:

Checking means investigation of machine condition. It is very important work in case of maintenance. It is very skilled depends work as successful maintenance that depends on correct fault detection.

Repairing:

Repairing or altering of spares & equipment (if necessary) is to be detected & necessary measures are taken (repairing\altering\setting\adjustment).

Overhauling:

It is the work of maintenance, but not frequent or schedule work. It is done as per as necessary.

13.5 DAILY AND WEEKLY MAINTENANCE SCHEDULE

Every day:

- Cleaning of Nozzle support, cutter and tucking housing
- Oiling of left hand cutter, center cutter and right hand cutter
- Cleaning the cover of the cam box and dobby, and all machine cover
- Cleaning and oiling of harness frame L.H and R.H
- Cleaning Maintenance room and lubricant room
- Cleaning of weaver stand weaver side and beam side

Saturday:

- Cleaning of right side of machine, motor belt, timing belt and air filter housing
- Cleaning and oiling of staubli lever

Sunday:

- Check the oil lever of tappet cam box, dobby, tucker housing, lubrication pump and cam box hydraulic pump

Monday:

- Greasing of rod end and back rest roller

Tuesday:

- Cleaning of right side of machine, motor belt, timing belt and air filter housing
- Cleaning and oiling of staubli lever

Wednesday:

- Greasing of press roller, tucking gear (L.H, Centre, R.H) and L.H, cutter electromagnetic cutter bracket

Thursday:

- General cleaning of left side of the machine

Friday:

- Cleaning the machine using vacuum

(Note: Schedule will be changed depending on new planning)

13.5 SOME LOOM RELATED MAINTENANCE

13.5.1 MAINTENANCE DURING EACH BEAM CHANGE

❖ **Machine cleaning**

- ✓ Check for fly or size dust accumulation. (Driving belt and pulley, shedding timing belt and pulley, dropper and contact bar reed and slay main brake) and EDP, electric drum.
- ✓ Check the air filter
- ✓ Check the tucker oil cap (Filter)
- ✓ Check the oil filter of tappet cam box
- ✓ Check easing housing shaft for extra yarn
- ✓ Check the tuck in housing gear and gear shaft
- ✓ Over all weaving machine

❖ **Oiling and Greasing**

- ✓ Check the oil level
  - o Right and Left hand gearing boxes
  - o Shedding tappet and dobby boxes
  - o LH tucker housing, center tucker housing and RH tucker housing
  - o Electronic controlled take up drive worn box
  - o Let off drive box
  - o Oiling the frame link joints
- ✓ Greasing
  - o Staubli harness motion lever pins
  - o Staubli cam motion lever (fixing element)
  - o Electronic controlled take up drive gear box
  - o Yarn beam holder, locking pin and roller
  - o Take up motion roller chain R.H or oil

❖ **Check up the clearance of bevel gear and cam gear**

13.5.2 QUARTERLY MAINTENANCE

- ✓ Over hauling of E.D.P (E.D.P pin)
- ✓ Check up the tensioned spring
- ✓ Check up the electromagnetic cutter L/H
- ✓ Change oil of tucker box L/H, centre, R/H

(Note: Schedule will be changed depending on new planning)

13.5.3 YEARLY MAINTENANCE

1. Overhauling of valve and E.D.P pin

- ✓ Main valve 1 and 2
- ✓ Tandem valve 1 and 2
- ✓ Cut blow valve 1 and 2
- ✓ Sub nozzle valve 15 pcs
- ✓ E.D.P pin

2. Overhauling of take up drive R.H

- ✓ Check up of indirect take up roller chain
- ✓ Check up tension plate

3. Cleaning of air filter and oil filter of tappet box

4. Check up easing lever and rod end

- ✓ Check the easing rod end for radial looseness or wear
- ✓ Check the easing lever pin and bushing for raid looseness of wear

5. Check up the driving V-belt

- ✓ Check the driving belt for damage
- ✓ Check for fly and oil accumulation
- ✓ Check the belt tension

6. Check up shedding timing belt

- ✓ Check the shed timing belt for damage
- ✓ Check for fly and oil accumulation
- ✓ Check the belt tension

7. Check up E.D.P. and tensor spring

- ✓ Check the fly and size dust from the electromagnetic pin, measuring band and their surroundings
- ✓ Check the reflector of the wind sensor
- ✓ Check that a weft is correctly threaded through the leaf spring tenser and adjusted to the optimum tension

8. Check up dropper box

- ✓ Check for fly or size dust accumulation
- ✓ Remove extra dropper

9. Check up of harness lever and harness frame

- ✓ Remove extra heald wire
- ✓ Check the harness frame middle support
- ✓ Check up the clearance of harness frame and harness guide sideways
- ✓ Check up the clearance of harness frame and harness support up and down
- ✓ Check up the allen screw of harness frame (re-tightening)
- ✓ Check up the allen screw of harness lever (re-tightening)
- ✓ Check up and cleaning harness lever

10. Check up of the press roller and back roller

- ✓ Check press roller arm
- ✓ Check press roller felt
- ✓ Check up the back roller bearing

11. Check up of L.H cutter and R.H cutter

- ✓ Check the cutter blade L.H for wear
- ✓ Check the cutter blade R.H for wear
- ✓ Check the cover of L.H cutter

12. Check up of oil leak on gear box and easing housing

- ✓ Check up oil leak on gear box L.H
- ✓ Check up oil leak on gear box R.H
- ✓ Check up oil leak on easing bearing housing L.H

13. Change oil

- ✓ Change oil the tucker box L/H, centre, R/H
- ✓ Change oil the left and right gear box
- ✓ Change oil the cam box or dobby
- ✓ Change oil the let off box
- ✓ Change oil the take up box

14. Apply grease of all greasing point

- ✓ Press roller
- ✓ Harness lever
- ✓ Electronic controlled take up gear box
- ✓ Electromagnetic cutter L.H.
- ✓ Easing rod and easing rod end
- ✓ Back rest roller
- ✓ Tucker gear shaft

15. Machine general cleaning

- ✓ Cleaning of weaver stand.
- ✓ Cleaning of cover of tappet cam box and dobby
- ✓ Cleaning of beam gear and beam cover
- ✓ Cleaning of beam side
- ✓ Cleaning of weaver side
- ✓ Cleaning of all parts and accessories

(Note: Schedule will be change depending on the loom availability)

13.6 MONTHLY MAINTENANCE FOR SIZING MACHINE

13.6.1 HEAD STOCK

- ✓ Main gear box oil lever checking
- ✓ Gear box arm spindle greasing checking
- ✓ Drive wheel and V-belt tension checking
- ✓ Warm gear cleaning and teeth checking
- ✓ Comb screw thread cleaning spray oiling check
- ✓ Timing belt teeth gear checking
- ✓ Beam load and unloading checking
- ✓ Delivery roller rubber strip checking
- ✓ Delivery roller gearbox oil lever checking
- ✓ Comb up and down oscillation checking
- ✓ Universal join connection checking
- ✓ Universal joint greasing checking
- ✓ Weavers beam clamping and unclamping check
- ✓ Clamping and UN clamping gear checking

13.6.2 WAXING DEVICE

- ✓ PT hundred stick edge cleaning checking
- ✓ Level sensor position checking
- ✓ Wax storage tank cleaning checking
- ✓ Steam traps checking
- ✓ Dividing roller position checking
- ✓ Cloth roller checking
- ✓ Moisture sensor roller cleaning
- ✓ Expansion roller moving check
- ✓ Steam glove valve licks checking

13.6.3 STEAM DRYER SECTION

- ✓ Chain drive gear box oil level checking
- ✓ Cylinder drive motor coupling check
- ✓ Chain drive spoke gear checking
- ✓ Chain length checking
- ✓ Chain spoke bearing check
- ✓ Chain tensioned wheel checking
- ✓ Hydraulic oil level checking
- ✓ Hydraulic knob checking
- ✓ Cylinder bearing housing check
- ✓ Cylinder bearing greasing check
- ✓ Cylinder PT hundred cleaning checking
- ✓ Cylinder tarpon coating checking
- ✓ Cylinder position alignment check
- ✓ Steam traps checking
- ✓ Pneumatic control globe valve checking
- ✓ Pneumatic control globe valve diaphragm checking
- ✓ Drive chain oiling checking

13.6.4 SIZING CENTRE

Checking drives (visually and by ear)

Checking drives parts (shaft, belts, cones etc)

Immersion roller bearing and housing check

Squeeze roller and bearing check

Pendulum roller tension spring check

Pendulum roller tension scale check

Guide roller tarpon coating check

Guide roller bearing and housing check

13.6.5 COOKING

- ✓ Gear box oil level check
- ✓ Water flow meter check function correctly
- ✓ Cooking catly steam line checking
- ✓ Cooking catly fan screw tightens check
- ✓ Pneumatic and steam valve checking
- ✓ Storage tank delivery pipe line cleaning checking
- ✓ Checking bearing of gearbox

13.6.6 CREEL

- ✓ Check brakes (visually and by air)
- ✓ Checking brakes cylinders for free movement
- ✓ Checking brakes shoe for wear
- ✓ Checking beam support hubs for free movement
- ✓ Checking he axial guides warp beam bearing
- ✓ Checking the crane and loading equipment
- ✓ Checking warp beam alignment

13.7 MANPOWER SET UP FOR MAINTENANCE

SL	Designation
1	Department Head
2	Asst. Manager
3	Sr. Technical Officer
4	Asst. Technical Officer
5	Asst. Fitter
6	Machine Cleaner/ Helper

Table – 15: Manpower set up for maintenance department at TFL

13.8 MAINTENANCE TOOLS AND THEIR FUNCTION

Tools or equipment	Functions
Adjustable wrench	Used for setting nut and bolts.
Air suctioner	For cleaning machine.
Spanner	Fixed spanner for nut and bolts fitting.
Socket spanner	Handle system for nut and bolts fitting.
Hammer	To apply load where required.
Screw driver	To release any screw.
Punch	Used to fit any worn out shaft.
Lock opener	To open the clip of bearing.
Hack saw	To cut any metallic thing.
Outside calipers	To measure outside dia.
Inside caliperse	To measure inside dia.
Cutting pliers	To cut thin wires.
Pulley key	To loosen pulleys.
Air gun	To clean the machine.
Grinding machine	To make the smooth fabrics.
Tester	To test electronic circuit.
Pliers	To grip anything and cut anything.
Star driver	Screw unlocking.
Steel tape	To measure length, width and height.
Chisel	To cut any metal.
L-key	For loosen and tighten the screw.
File	To smooth the rough surface.

Table – 16: Maintenance tools or equipments and their corresponding function

CHAPTER - 14

R & D Department
(Includes CCI Loom)

TALHA FABRICS LTD.

14.1 R & D

Research and development is one of the means by which business can experience future growth by developing new products or processes to improve and expand their operations. In TFL, R & D plays an important role in the whole production process. Recently two cci sampling looms and a cci warping machine are included to the R & D of TFL, which will ensure more efficient production and enable upgraded fabrics to be produced.

14.2 WORK OF R & D

- ✓ Fabric Analysis
  - o Weave (structure)
  - o Order of coloring in warp and weft
  - o Sett-ends and picks per cm Yarn particulars
    - ▪ Count
    - ▪ Twist per inch
    - ▪ S or Z twist
    - ▪ Single or fold yarn
  - o Crimp% in warp and weft
  - o Width of warp in reed
  - o Warp length for a given finished fabric length (m)
  - o Weight of fabric per unit area (gm/m^2)
  - o Type of material for both warp and weft
- ✓ Pattern Sheet Making
- ✓ Requisition of warp & weft
- ✓ Follow of production of every specific pattern
- ✓ Daily note the Production of every pattern
- ✓ Making new creative sample and show the buyer

14.3 R & D CALCULATION

14.3.1 TYPICAL CALCULATION FOR DIRECT WARPING

Construction: $\frac{20 \times 20}{98 \times 66} \times 58"$

Order Quantity: 2800 mtr

Allowance: 15%

Warp length: 3200 mtr

So, Total ends = EPI × fabric width

= 98 × 58

= 5684

Reed count = EPI × 0.91

= 98 × 0.90

=88/2

Reed width = total ends/ reed count

= 5684/90

= 63.16

Wt of warp = (total ends × length of warp) ÷ (1000 × 1.6933 × warp count)

= (5684 × 3200) ÷ (1000 × 1.6933 × 20)

= 537.08 kg

Wt of weft = ((reed width + 6) × PPI × order quantity) ÷ (1000 × 1.6933 × weft count)

= [(63.16 + 6) × 66 × 3200] ÷ (1000 × 1.6933 × 20)

= 431.31 kg

14.3.2 TYPICAL CALCULATION FOR SECTIONAL WARPING

Construction: $\frac{40 \text{ x } 40}{120 \text{ x } 80} \times 58"$

Order quantity = 1200 meter

Allowance = 15%

Warping length = 1380 meter

So, Total ends = EPI × Fabric width

= 120 × 58

= 6960

Wt of warp $= \frac{\text{total ends} \times \text{warp length} \times 0.4536}{\text{Count} \times 840 \times 0.9144}$

$= \frac{1380 \times 6960 \times 0.4536}{40 \times 840 \times 0.9144}$

= 141.80 kg

Wt of weft $= \frac{\text{PPI} \times \text{warp length} \times (\text{Reed width} + 6) \times 0.4536}{\text{Count} \times 840 \times 0.9144}$

$= \frac{80 \times 1380 \times (63+6) \times 0.4536}{40 \times 840 \times 0.9144}$

= 112.47 kg

Warp pattern	**Weft Pattern**
Optical white = 12	Optical white = 8
Black = 2	Black = 1
Optical white = 12	Optical white = 8
Blue = 2	Blue = 1
Optical white = 12	Optical white = 8
Green = 2	Green = 1
Total = 42ends/Pattern	Total = 27ends/Pattern

In warp:

Wt of Optical white = 141.80 kg × $\frac{36}{42}$ = 121.54 kg

Wt of Black = 141.80 kg × $\frac{2}{42}$ = 6.75 kg

Wt of Blue = 141.80 kg × $\frac{2}{42}$ = 6.75 kg

Wt of Green = 141.80 kg × $\frac{2}{42}$ = 6.75 kg

In Weft:

Wt of Optical white = 112.47 kg × $\frac{24}{27}$ = 100 kg

Wt of Black = 112.47 kg × $\frac{1}{27}$ = 4.16 kg

Wt of Blue = 112.47 kg × $\frac{1}{27}$ = 4.16 kg

Wt of Green = 112.47 kg × $\frac{1}{27}$ = 4.16 kg

14.4 CCI SAMPLING LOOM

Fig – 13: CCI Sampling looms available in R & D Dept. of TFL

14.4.1 TECHNICAL SPECIFICATION

Model:	The Studio
Serial No:	S3011205M9
Mfg. Year:	November, 2011
Net Weight:	1000 Kg
Manufacturer:	CCI TECH INC, TAIWAN
Power Source:	220 V, 3 Phase, 50/60 Hz
Max. Power:	6 KW
Weaving Width:	8-17 inches（203mm－432mm)
Speed:	150 ppm maximum
Weft Selector:	12 colours electronic weft selection device
Fabric Take-up:	Electronically controlled. Weft density can be changed freely within the same weave
Warp let-off:	Positive electronically controlled. Warp tension could be displayed and set through the computer
Shedding:	Computerized controlled. Maximum 24 heald frames driven by servo-motor. Adjustable Shedding
Draw-in:	Heald frames can be separated from the loom for healds and reeds draw-in
Weft Insertion:	Single rapier weft insertion driven by servo-motor. Speed could be controlled independently through the computer
Beat-up:	Computerized servo-motor controlled. Beat-up could be achieved in different positions
Weft Breaks:	Electronic weft-break detecting device. Loom stops when weft breaks
Warp Breaks:	Warp-break detecting device. Loom stops when warp breaks (Optional)
Designing:	Built-in SEdit2 design and editing software. It could also be installed separately on other PC for design works
Controller:	PC Based-Industrial PC/ Windows Embedded operating system / Solid-State Drive (SSD）

CHAPTER - 15

Industrial Compliance

TALHA FABRICS LTD.

15.1 COMPLIANCE

Compliance means 'acting according to certain accepted rules and standards'. Textile and Clothing (T&C) Compliance indicates international formulated standards and guidelines for the said industries.

15.2 AVAILABLE FACTORY COMPLIANCE

- ✓ No child labour
- ✓ No forced labour
- ✓ Transport facilities for worker
- ✓ Hours of work
- ✓ Voluntary over time
- ✓ Intervals for rest
- ✓ Weekly holidays
- ✓ Annual leave
- ✓ Festival holidays & leaves with bonus
- ✓ Maternity protection
- ✓ Worker's welfare committee
- ✓ Mineral drinking water
- ✓ Sanitary facilities
- ✓ First aid box
- ✓ Canteen services
- ✓ Day care centre
- ✓ Health care activities for the worker & employ company doctor
- ✓ Fire extinguisher each & every floor & conduct fire drill at least 12 times a year. TFL gives a top priority on prevention of fire and eventual evacuation.
- ✓ Other safety department (no discrimination)
- ✓ Compensation cases department
- ✓ The development of compliance programmer
- ✓ Environmental developer
- ✓ Smoking free zone

15.3 SAFETY REQUIREMENTS

Fire Bucket : 64 pcs.

Fire Bitter : 22 pcs.

Fire Hook : 18 pcs.

Fire Hose : 57 pcs.

Fire Blanket : 08 pcs.

Gass Mask : 25 pcs.

Hand Mike: 04 pcs.

Fire Water Drum: 54 pcs.

15.4 FIRE EXTINGUISHER

Type of Fire Extinguisher	Quantity
DCP	130 Pcs
CO2	86 Pcs
Water	29 Pcs
Foam	06 Pcs
Total	250 Pcs

Table – 17: Fire Extinguisher available at TFL with their quantity

15.5 FIST AID BOX

Area of Use	Quantity
Admin & Store	02
Weaving & Mechanical	03
Electrical & Utility	03
Sizing & mending	03
Picanol	02
Total fist Aid Box	13

Table – 18: First Aid Box available at TFL with their quantity

15.6 HEALTH & SAFETY

- ✓ Talha Fabrics Ltd. has a separate sounding fire alarm, that is distinct & audible in all parts of the workplace & that can be rung from various points throughout the facility.
- ✓ Workers are trained in emergency procedures.
- ✓ Emergency evacuation routes are marked on floors.
- ✓ TFL provides one first aid kit per 100 employees.
- ✓ First aid kits are fully stocked.
- ✓ TFL have functional & clean toilets for worker use.
- ✓ Safe drinking water is available for all workers at all time.
- ✓ TFL provides eating areas that are separate from the main work area, clean, protected from the weather & with enough seats for all workers on break at once.
- ✓ Work areas are ventilated.
- ✓ TFL have adequate temperature control.
- ✓ Workers wear footwear to avoid foot injury.
- ✓ Chemicals are stocked & used in designated areas that are adequately ventilated.
- ✓ Electrical boxes are covered & switches are labeled.
- ✓ Doctor is available.

15.7 SOME CAPTIONS RELATED TO COMPLIANCE OF TFL

Fig – 14: Some captures of TFL related to compliance issue

CHAPTER - 15

Conclusion

TALHA FABRICS LTD.

16.1 CONCLUDING COMMENT

We are enough fortunate to have an opportunity of having our internship in this mill. Technical education and its adoption in practical field we involved inextricable, without the implementation of the knowledge gathered in technical education, its success bound to suffer. Therefore this two month industrial training, as a practical fulfillment of our B.Sc in Textile Engineering course, helps us to accomplish the gap between the theoretical and practical knowledge by providing an elementary idea about industrial environment, machine processing, machine tools & equipment, production system and maintenance, administration and management system. Above all, this training for 48 days in TALHA FABRICS Ltd, has given us a new experience for professional life. We tried to gather all necessary information but it is difficult to collect all kind of data. But we tried to do our best and the whole industry training was satisfactory. We would like to thank the authority of TALHA FABRICS Ltd as well as our honorable supervisor and teachers for their altruistic help and advice. Besides this attachment gave us the first opportunity to work in an Industry and acquainted us with the internal sight and sound of Textile Industries. We believe with all these, the experience of the industrial attachment will help our future life as a Textile Engineer.

16.2 LIMITATIONS

- ✓ Because of secrecy act, the data of marketing activities have not been supplied.
- ✓ We did not get enough supervision form the responsible persons of different section due to their busy schedule. So there may some limitation of data of different section in this report.
- ✓ We had a very limited time. In spite of willingness to study in more details it was not possible to do so.
- ✓ Due to some unavoidable reasons like ‘Hartal’, Political unrest we faced a lot of problems to continue our attachment.
- ✓ Some of the points in different chapters are not include as these were not available.

16.3 SUGGESTIONS

- ✓ Due to shortage of technical persons (Textile Engineers) sometimes quality level drops which need to be minimize by employing technical person, especially at night shift.
- ✓ During our training period, most of the time the product were not first time right and need to be re processed, increasing the production cost this problem has to be overcome.

- ✓ We observe that there is lack of understanding between the top level personnel and floor level workforce, weakening the chain of command.
- ✓ Supervisor or floor in-charge did not properly follow the program. So sometimes, operators deviate from the set procedure which may hamper the quality of the product.
- ✓ The machine in weaving and finishing section should be modernized to control all the parameters properly to minimize the rejection percentage.
- ✓ Weaving production needs to increase as well as technical persons need to employed there.
- ✓ The machine stoppage time should be analyzed and minimized. The maintenance should be carried out when the machine is out of action and routine maintenance should be carried out regularly.
- ✓ More skilled labor should be used in the project to improve productivity.

APPENDIX

List of Figures

List of Tables