



**Department of Textile Engineering
Faculty of Engineering**

**Course Title: Industrial Attachment
Course Code: TE 431**

A report on (Crystal Composite Ltd.)

Submitted by
Md Rakibul hasan
ID: 133-23-3638
Md.Rasel ahmmed
ID: 151-23-4275

Supervised by
Sumon Mazumdar
Assistant Professor
Department of Textile
Daffodil International University

(A report submitted in partial fulfillment of the requirements for the degree of Bachelor of Science in Textile Engineering)

Semester: Fall Year: 2018

Declaration

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

Md.Rakibul Hasan

ID:133 -23- 3638

Department of TE

Daffodil International University

Md.Rasel Ahmmed

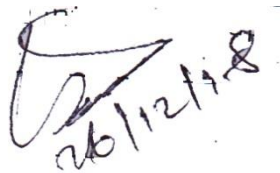
ID: 151-23-4275

Department of TE

Daffodil International University

Letter of Approval

The internship report on **Crystal Composite Ltd.** is prepared by **Rasel Ahmmed** of bearing **ID:151-23-4275** & **Md. Rakibul Hasan** of bearing **ID: 133-23-3638**. 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 my supervision and guidelines. During the internship the student was found sincere, punctual and hard working. I wish him every success in life.



Sumon Mazumder

Assistant Professor

Department of Textile Engineering

Faculty of Engineering

Daffodil International University

Acknowledgement

All pleasure goes to the Almighty Allah to give us strength and ability to complete our two months long industrial attachment at Industry name. It was a great opportunity for us to complete the industrial attachment with the assistance of persons employed in Industry name.

We feel grateful to our academic supervisor Sumon Mazumder, Assistant Professor, Department of Textile Engineering, Faculty of Engineering, Daffodil international University as well as to Name of your industry supervisor, our factory supervisor for their continuously guiding us about the development and preparation of this training report. They have enriched us with sharing necessary theoretical and practical ideas and supervised us to complete this report on time.

We would like to express our thanks to **Prof. Dr. Md. Mahbub ul Haque**, Head, Department of Textile Engineering, Faculty of Engineering, Daffodil international University for his kind help to finish our training report. We would like to express our thanks to **Prof. Dr. Md. Zulhash Uddin**, Dean, BUTex for providing us necessary information to complete the report.

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

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

Dedication

Dedicated to our Parents & Teachers.

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Chapter-1

Executive Summary

The internationally recognized Buyers or clients are looking for those countries for producing their apparel products where different types of mills have established as a one stop source for the global apparel market, satisfy and meet customer's expectation by developing and providing products and services on time, which offer value in terms of Quality, Price, Safety & Environmental impact. And also assure complete compliance with the international quality standards and also to provide the employees internationally acceptable working condition/standards. In Bangladesh, there are different types of Textile Industry those are producing high quality textile and apparel product. Crystal Composite Ltd. is one of them. Crystal composite Ltd. is A France-Bangladesh joint venture limited company with Composite Knit Garments Manufacturer & Exporter, having all state of the art facilities with annual turnover Tk. 10,00,00,000 to 12,00,00,000 . They have Different types of knitting. Dyeing,

Cutting, Sewing, and Finishing machines supplied by mostly Japan, Taiwan, U.K, USA, Singapore, etc. which are very latest. It has high production where 10 tons of dyed and finished fabrics are produced per day. The production is controlled by technical persons. All of the decision makers of production sector in Crystal Composite Ltd. are textiles graduates. All the chemicals and dyes use for dyeing and finishing are well branded. They produce their product for their buyer and client those are coming from international market like U.K, Ireland, France, Germany, Belgium, Spain. They follow all the system for their machines maintenance so production can not hamper.

In this report, I have tried to give some information about Crystal Composite Ltd. and I have observed that Crystal Composite Ltd. produce high quality fabric and fulfill the special requirements from the different types of buyers by following different internationally recommended standard method.

After successful operation in Pantex Dress Limited, the owner of Pantex had decided to start a fully information & technology based along with the social accountability and quality controlled modern ready made composite knit garments industry in large scale. In this connection Mr.Salim Ahamed (Managing Director) had decided in a resolution to start a company in Ashulia in the year 2006 to manufacture knitwear garments for the international market. Right from inception the policy of the company has been to provide total customer satisfaction by offering quality knitwear in time. To meet the commitments of quality and prompt delivery, Crystal Composite Ltd. Decided to integrate the manufacturing process in a planned manner. Over the years the entire process has been integrated by importing sophisticated machinery from world-renowned manufacturers.

Working on new concepts in styling & content of the knitwear is a continuous activity in Crystal Composite Ltd. With an objective to up the quality and the value of merchandise. In 2006, the year in which International business was started, Crystal Composite Ltd. Concentrated all its strengths and resources in developing a wide range

Chapter-2

Information about Factory

After successful operation in Pantex Dress Limited, the owner of Pantex had decided to start a fully information & technology based along with the social accountability and quality controlled modern ready made composite knit garments industry in large scale. In this connection Mr.Salim Ahamed (Managing Director) had decided in a resolution to start a company in Ashulia in the year 2006 to manufacture knitwear garments for the international market. Right from inception the policy of the company has been to provide total customer satisfaction by offering quality knitwear in time. To meet the commitments of quality and prompt delivery, Crystal Composite Ltd. Decided to integrate the manufacturing process in a planned manner. Over the years the entire process has been integrated by importing sophisticated machinery from world-renowned manufacturers.

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The Crystal Composite Ltd. is committed to the best human workplace practices. Their goal is to continuously improve their Human resource policies and procedures through education, training, communication and employees involvement.

To that end the Crystal Composite Ltd. 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:

- I. Child labor
- II. Forced labor
- III. Health & Safety
- IV. Freedom of assembly/ Right to collectively
- V. Discrimination
- VI. Disciplinary practices
- VII. Working hours
- VII Remuneration/ Compensation

Quality Policy

Crystal Composite Ltd. is a 100% export oriented composite knitted fabric & garments manufacturing company with a mission to be one of the leading exporters in providing the quality knitted garments from Bangladesh to various customers around the globe. In order to achieve the mission, Crystal Composite Ltd. is committed to:

- Produce high quality products, by implementing company wide standards.
- Customer satisfaction.
- On time delivery to customers by planning every shipment.
- To decrease the percentage (%) of rework.
- Evaluate the suppliers on yearly basis.
- Give safe and health - working environment to workers.
- Improve continually in the quality management system with every year to come.

Quality Objectives

The management and Employees of Crystal Composite Ltd. works to implement quality in all steps of their activity starting from selecting raw materials through all steps of productions to the ultimate finished products. To ensure quality at all levels they adhere the following objectives:

- 100% Follow - up customer feedback promptly.
- Encourage every employee to suggest/recommend for improvements.
- Prompt reply to customer complaints to build their confidence and satisfaction.
- Minimizing the downtime for every machine.
- To increase 5% export every year.
- To decrease 8% customer complain every year.
- To minimize 5% rejection of products every year.
- Ensure timely shipment.

Machinery Layout plan of different departments

Layout plan of knitting section

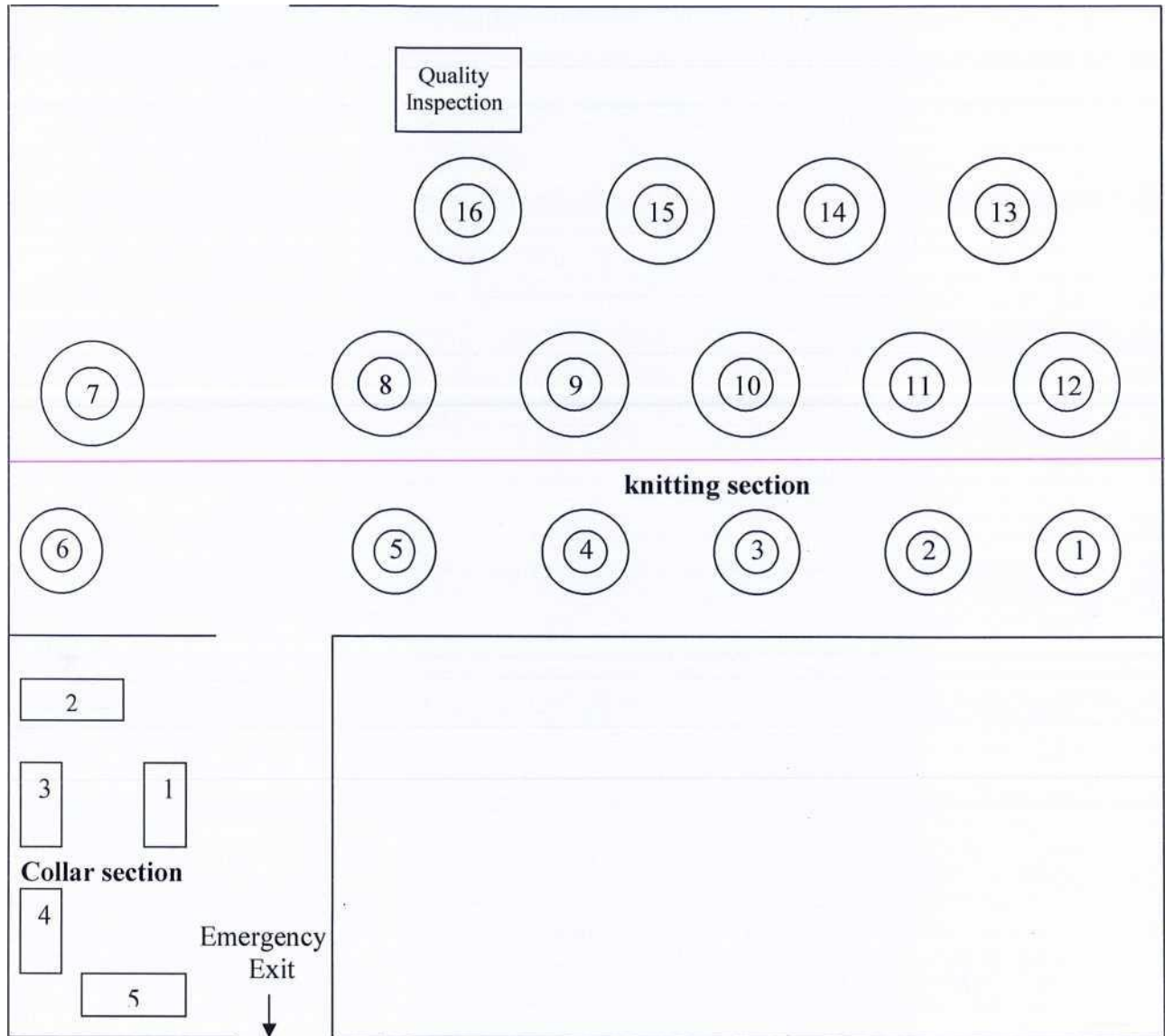


Fig: Layout plan of knitting section

Chapter-3

Details of Attachment

M/C specification of knitting section

Collar M/C (Computerized flat knitting m/c):

Quantit	MACHINE	Specification	BRAND	ORIGIN
05	Collar M/C (Model: JL-303)	Single carriage six colors yarn	JY LEH INDUSTRIAL CO. LTD.	TAIWA N

Circular Knitting M/C:

SL	MACHINE GRADE	DIA	GAUGE	No. of Feeder	BRAND	ORIGI N
01	Rib (Model:	36"	18	72	JIUNN LONG MACHINE	TAIWA
02	Rib (Model:	34"	18	68	JIUNN LONG MACHINE	TAIWA
03	Rib (Model:	34"	18	68	JIUNN LONG MACHINE	TAIWA
04	Rib (Model:	32"	18	64	JIUNN LONG MACHINE	TAIWA
05	S/J (Model: JLS)	21"	24	63	JIUNN LONG MACHINE	TAIWA
06	S/J (Model: JLS)	20"	24	60	JIUNN LONG MACHINE	TAIWA
07	S/J (Model: JLS)	22"	24	66	JIUNN LONG MACHINE	TAIWA
08	S/J (Model: JLS)	23"	24	69	JIUNN LONG MACHINE	TAIWA
09	S/J (Model: JLS)	24"	24	72	JIUNN LONG MACHINE	TAIWA
10	S/J (Model: JLS)	25"	24	75	JIUNN LONG MACHINE	TAIWA
11	S/J (Model: JLS)	28"	24	84	JIUNN LONG MACHINE	TAIWA
12	S/J (Model: JLS)	30"	24	90	JIUNN LONG MACHINE	TAIWA
13	Fleece (Model:	36"	20	102	GOANG-LIH MACHINERY	TAIWA
14	Fleece (Model:	34"	20	96	GOANG-LIH MACHINERY	TAIWA
15	Fleece (Model:	30"	20	84	GOANG-LIH MACHINERY	TAIWA
16	Fleece (Model:	30"	20	84	GOANG-LIH MACHINERY	TAIWA

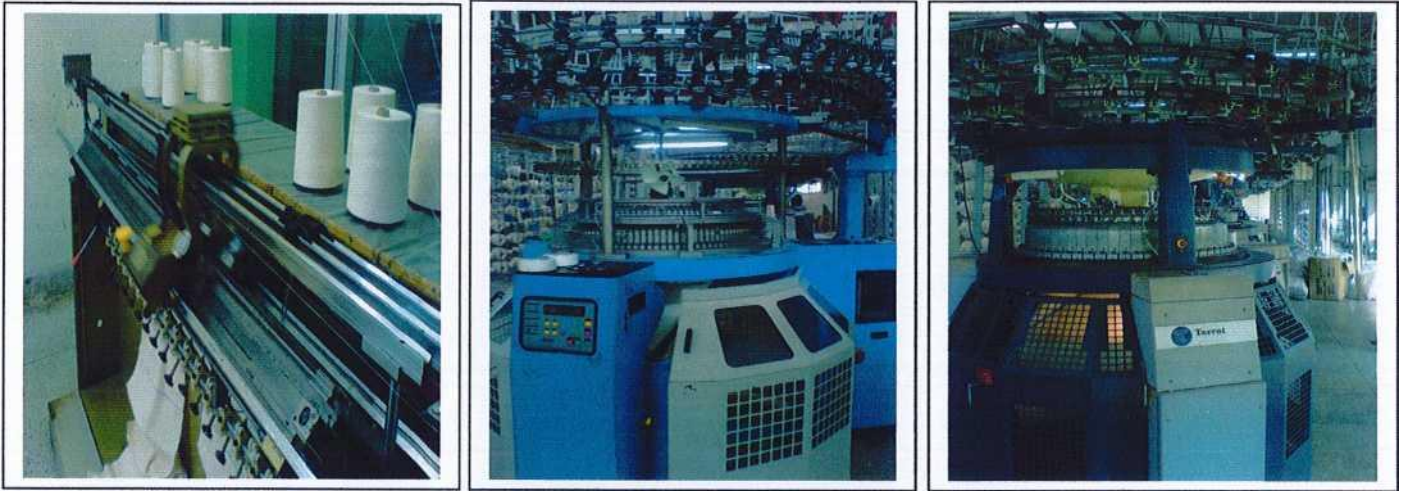


Fig: Flat bed knitting machine **Fig:** Circular knitting machine (S/J) **Fig:** Circular knitting machine (Rib)

Specification of Quality Inspection instrument for grey fabric

Brand: Hsing Cheng

Model: HC-TIM-1500mm-A1 1751

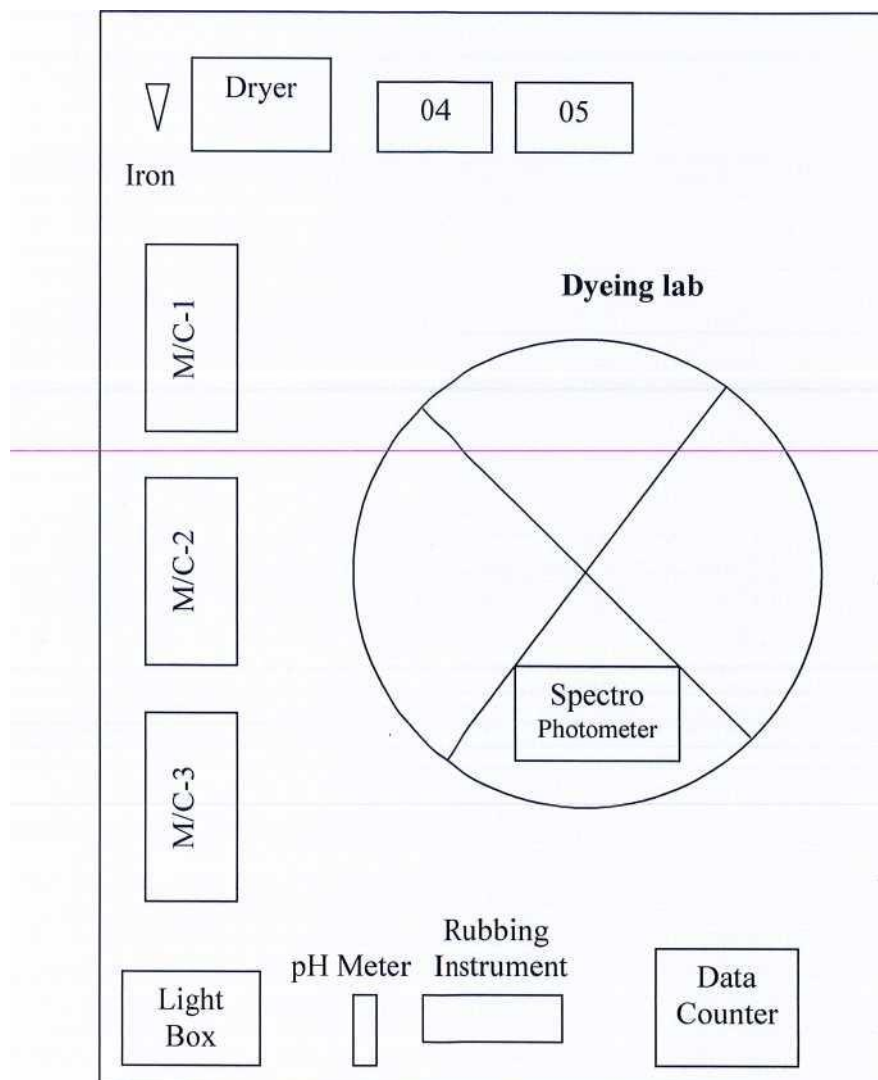
M/C specification of batching section

Turnover M/C:

Brand: Twin Eagle Machinery Co., Ltd., Taiwan

Quantity: 2 pcs.

Layout Plan of Dyeing Lab



Specification of the instruments in dyeing lab

M/C-1:

Type: Sample Dyeing

Type: Sample Dyeing **Brand:**

Model: HS-24SF

Brand: Century faith industrial ltd.,

Taiwan. M/C-2:

Type: Sample Dyeing

Brand: Heshan perfect dyeing equipment

factory ltd., China.

M/C-3:

Type: Sample Dyeing

Brand: Heshan perfect dyeing equipment factory ltd., China.

Model: HS-24 **Serial:** 71146

Model: HS-

24 **Serial:**

71145

04:

Type: Sample

Dyeing **Brand:**

Datacolor

05:

Microprocessor pH meter: Brand: Hanna

Instrument

Iron:

Brand: Philips (Diva)

Hot plate stirrer:

Brand: Daihan Labtech Co. Ltd.

Electric Balance:

Brand: Adnenturer OHAUS Corp. USA **Maximum Capacity:** 150 gm

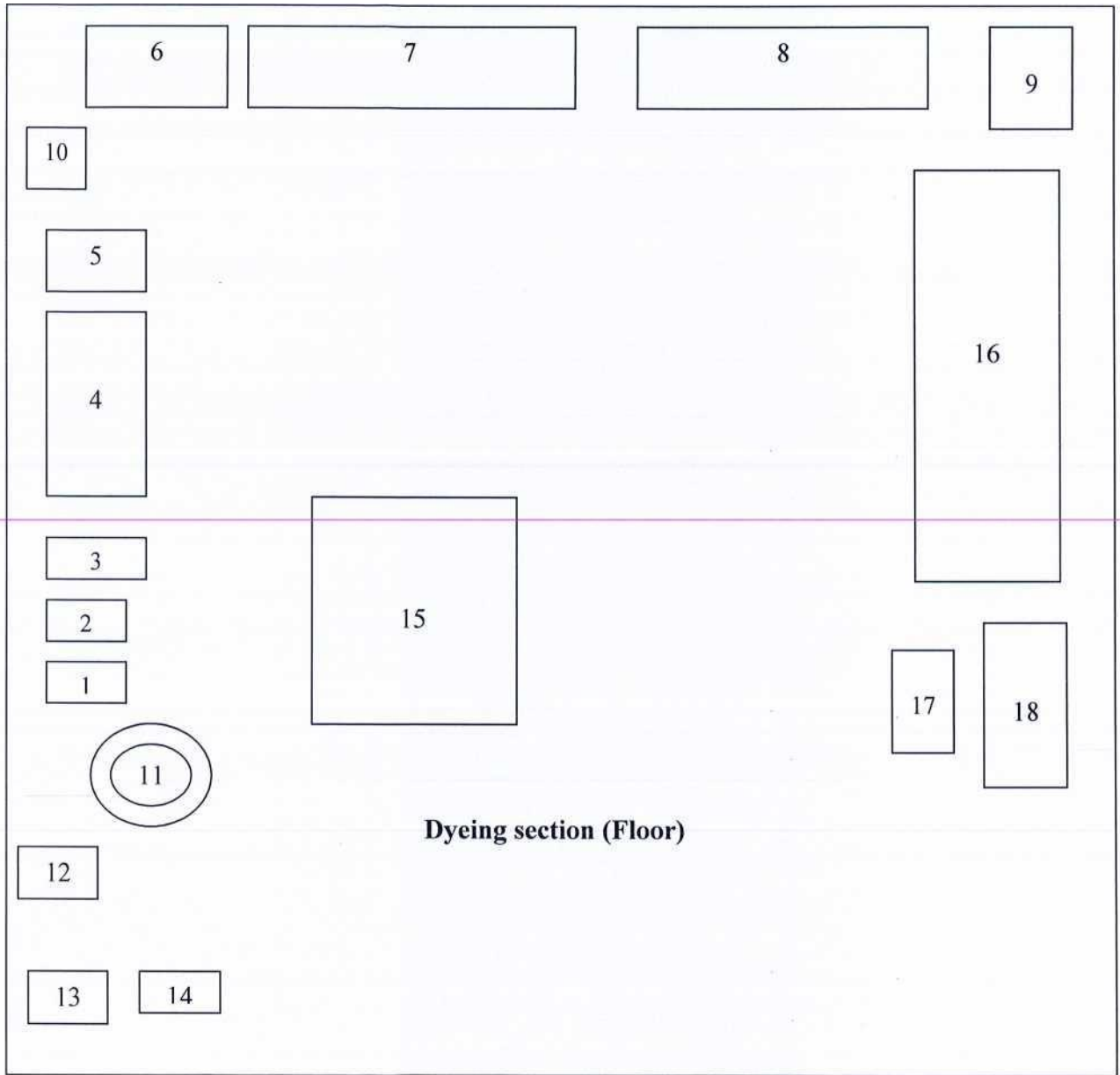
Digital pipette:

Brand: Dispense

Rubbing instrument:

Brand: James H. Heal & Co. Ltd.

Layout Plan of Dyeing & finishing Section (Floor)



Dyeing section (Floor)

Fig: Layout Plan of Dyeing Section (Floor)

E

M/C specification of dyeing section

1. **Brand:** Fong's National Engineering (Shenzhen)
Co. Ltd. **Type:** Dyeing m/c
Capacity: 10kg
Specification: High Temp,
m/c
2. **Brand:** Fong's National Engineering (Shenzhen)
Co. Ltd. **Type:** Dyeing m/c
Capacity: 10kg
Specification: High Temp,
m/c
3. **Brand:** Fong's National Engineering (Shenzhen)
Co. Ltd. **Type:** Dyeing m/c
Capacity: 60kg
Specification: High Temp,
m/c
4. **Brand:** Fong's National Engineering (Shenzhen)
Co. Ltd. **Type:** Dyeing m/c
Capacity: 750kg
5. **Brand:** Fong's National Engineering (Shenzhen)
Co. Ltd. **Type:** Dyeing m/c
Capacity: 150kg
6. **Brand:** Fong's National Engineering (Shenzhen)
Co. Ltd. **Type:** Dyeing m/c
Capacity: 600kg
Specification: High Temp,

7. **Brand:** Fong's National Engineering (Shenzhen) Co. Ltd. **Type:** Dyeing m/c
Capacity: 250kg
8. **Brand:** Fong's National Engineering (Shenzhen) Co. Ltd. **Type:** Dyeing m/c
Capacity: 30kg Specification: High Temp, m/c
9. **Brand:** Guohang m/c factory ltd.
Type: Hydroextractor
10. **Brand:** Foshan Honsun jiam/c Equipment Factory.
Type: Washing m/c
11. **Brand:** Honsun Perfect Dyeing Equipment Factory, China **Type:** Garments Dryer
12. **Brand:** Guohang m/c factory ltd.
Type: Wet Calender
13. **Brand:** Bianco® S.P.A **Type:** Squeezer
Specification: Max. speed 80 m/min
14. **Brand:** Dilmenler, Turkey **Type:** Dryer **Capacity: 10000**
15. **Brand:** FERRARO, ITALY **Type:** Calender **Capacity: 3000**
16. **Brand:** Tube-Tex Tubular Textile LLC, USA **Type:** Compactor
Capacity: 700Specification of brush M/C

BRAND: I KUANG MACHINE WORKS COMPANY LTD. **ORIGIN:** TAIWAN

Picture of Dyeing and Finishing Machine

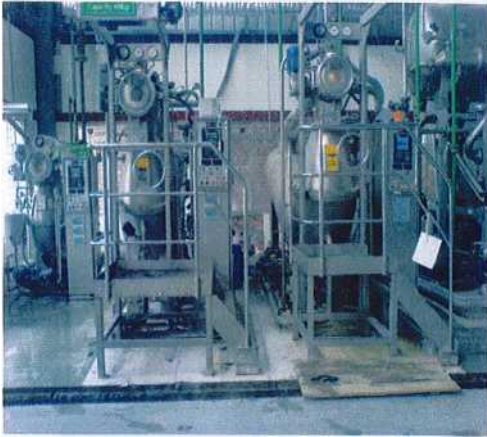


FIG: Fong's High Pressure High



FIG: Fong's Low Pressure Atmospheric



Fig: De-water M/c



Fig: Hydro-Extractor M/c



M/C specification of garments section

Specification of Computerized marker making (CAD)

Software: LECTRA

Specification of cutting machine

Type: Straight knife cloth cutting machine (10" & 8")

Specification of sewing machine

Type: Different types of lock stitch, chain stitch, zigzag, scalloping stitch, over loc stitch, flat lock stitch, button holing, button attaching, bar tack stitch machine.

Brand: JUKI, BROTHER, PEGASUS Etc.

Specification of Embroidery machine

Brand: TAJIMA (Tokai Industrial sewing machine company Ltd.)

Origin: Japan

Raw materials

Crystal Composite Uses yam from different factories of Bangladesh. They uses spandex fibres comes from different countries of the world. Some of the sources of yarn are given below:

MSA Spinning Mills, Karim Spinning, Shamsuddin Spinning Mills Ltd., Arif Knit Spin Ltd., Suddin Spinning Ltd., Synthetic Yarn Ltd., TAE Kwang Industrial Ltd., NRG Spinning Mills Ltd., M.S.R. KTR., Saiham Textile Mills Ltd., Sufia Cotton Mills Ltd., OTTO Spinning Ltd., Matin Spinning Ltd., Delta Spinning Ltd., Gulshan Spinning Ltd., Malek Spinning Ltd., Utha , Rahamat Textile Ltd., MALWA, Hanif Spinning Ltd., Comilla Spinning Ltd., Badsha Spinning Ltd., Rokara, CREORA, Matro, Fuad Spinning Ltd., Zaber Spinning Mills Ltd., Zarin Spinning Ltd., Techno, Fiber Land Trading Co. Ltd., M.S.M.L, White Star, Latif Spinning Ltd., ISRAQ Spinning Ltd., AMTEX, Yasmin

List Of Dyes & Auxiliaries

SI. No.	Name of Dyes & Chemical
1.	SOLAZOL SCARLET SP3G
2.	SOLAZOL BLUE RSPL
3.	REACTIVE RED ME-4BL
4.	REACTIVE G. YELLOW ME-RL
5.	REACTIVE YELLOW ME-4GL
6.	REACTIVE ORANGE ME-2RL
7.	REACTIVE BLACK GR
8.	REACTIVE BLACK B
9.	REACTIVE NAVY BLUE ME-2GL
10.	REACTIVE DARK BLUE WR
11.	REACTIVE TERQUISE H-2GL
12.	REACTIVE NAVY WB
13.	REACTIVE RED BB
14.	Drimarine Blue CL-2RL
15.	Drimarine Red CL 5B
16.	Drimarine Yellow CL-2R
17.	Drimarine Blue CL-BR
18.	Drimarine Yellow HFR
19.	Drimarine Navy CL-GN
20.	Drimarine Red HF-2B
21.	Imcozin Blue E-NR
22.	Imcozin Red E-3BF
23.	Imcozin Yellow E-3R
24.	Indofix Yellow HF-4GL
25.	Indofix Black B
26.	Remazol Blue RR
27.	Remazol Red RR
28.	Remazol Yellow RR
29.	Reactofix Turquoise Blue G
30.	Perafix Black WNN
31.	Reactobond Blue RR
32.	Reactobond Red RR
33.	Reactobond Yellow RR
34.	Disperse Black EXNSF
35.	Disperse Blue 2GL
36.	Disperse Orange RSF
37.	Disperse Red CBNSF
38.	Disperse Red EFB
39.	Disperse Blue BRSF
40.	Disperse Yellow F-5GL
41.	Disperse Yellow HF-3RL

42.	Disperse Blue BGF
43.	Racto. Orange 3R (Discharge)
44.	Racto. Navy WB (Discharge)
45.	Racto. Red BB (Discharge)
46.	Pigment Blue (Fluorescent)
47.	Pigment Rose (Fluorescent)
48.	Pigment Yellow (Fluorescent)
49.	Pigment Blue (SW-28)
50.	Pigment Rose (SE-27)
51.	Pigment Yellow (SW-15N)
52.	Glauber Salt (Leveling Agent)
53.	Soda Ash Light
54.	Caustic Soda
55.	Imerol PCLF (Wetting Agent)
56.	Sirrix 2UD (Sequestering Agent)
57.	Biopolish AL (Enzyme)
58.	Denzyme BP (Enzyme)
59.	Kappaquest FE (Sequestering Agent)
60.	Geistab RS (Stabilizer)
61.	Mollan 129 (Soaping Agent)
62.	Geilev CL (Leveling Agent)
63.	Eco Soap (Soaping Agent)
64.	Eco FIX-R (Fixer)
65.	Geisoft CAN (Anticreasing Agent)
66.	Romapon 173 (Anticreasing Agent)
67.	Kappaquest SM
68.	H ₂ O ₂ (Bleaching Agent)
69.	Green Acid
70.	Syno White 4BK (Brightening Agent)
71.	HTS/AF-2000
72.	Magma CWS (Color) (Softener)
73.	Geisoft WCS (White) (Softener)
74.	GSS
75.	Ladiquet 1097 (Leveling Agent)
76.	Jinlev RLF (Dispersing & Levelling)
77.	Leucophore BSB (Brightening Agent)
78.	Hydrose Powder
79.	Bleaching Powder
80.	Apriton (Emulshion)
81.	Kappatex R98 (Hydrose)
82.	Heliz Binder CFF
83.	Cyclanon ERL
84.	Heliz Dark Blue
85.	Texosile Micro R
86.	Fixoline FZ-106

Product mix

Product mix:

- Count: 20-30
- Cotton(card & comb)
- PC
- Filament yarn
- Acrylic
- PVC
- Lycr

Product:

- Collar
- Cuff
- Placket
- Neck
- Cheats
- Bottom **Design:**
- Rib(1x1,2x2)
- Interlock
- Single jersey
- Lacost(single &
double)

KNITTING

Collar design mainly consists of five parts; namely:

- Tipping
- Separation part
- Double jersey / Tube
- Body
- Body end

YARN & DYEING

The products, which are available in knit dyeing, are as follows —

1. **Cotton**
2. **CVC**
3. **Polyester**
4. **Polyester / Cotton**

Dyestuff used:

Normally reactive dyes used for cotton part dyeing and disperse dyes used for polyester part dyeing.

Production planning, sequence & operations, Laboratory processing

Production Flowchart

Knitting

Batching

Dyeing & Finishing

Garments

Sequence of operations in knitting section

Sample fabric receive

Design analysis

Setting the machine for the specific design

Production

QC

Send to Batching section

Production parameters in Knitting section

The main parameters controlled in knitting section are stitch length, GSM, Fabric diameter etc. **Different parameters in knitting machine:**

Machine pitch (t) : Is defined as the distance between the centres of two adjacent Needle of the same needle row indicated in m.m.

$$\text{Pitch} = \frac{25.4}{\text{Gauge}(E)} \text{ m.m}$$

Machine gauge (E): Machine gauge denotes the number of needles per inch , arranged On the needle carrier and based on the nominal machine diameter.

$$\text{Gauge}(E) = \frac{25.4}{\text{Pitch}} \text{ m.m.}$$

Loops : It is a basic unit consisting of a loop of yarn meshed at its base with previously Basic unit.

Stitch : The smallest dimensionally stable unit of all knitted fabrics is the stitch . It consists of a yarn loop which is held together by being intermeshed with another stitch or other loops

Stitch is composed of:

Head

Side limbs

or shanks

Feet

Interlocking point

Stitch length: Stitch length is a length of yarn which includes the needle loop & half the sinker loop on either side of it. Generally the larger the stitch length, the more extensible & lighter the fabric & the poorer the cover, opacity & bursting strength.

Basic knitting element:

1. Needle.
2. Sinker.
3. Cam.

1. **Needle:**

Function of needles: Needle is raised to clear the old loop from the hook & to receive the new loop above it on the needle stem.

Types of needle: In general there are three types of needles.

- a. Bearded needle.
- b. Latch needle.
- c. Compound needle.

2. **CAM:**

Function of CAM: The functions of cam are as follows:

- > To produce motion to needles .
- > To drive the needles.
- > Formation of loops.

3. Sinker:

Function of sinker: It may one or more of the following functions dependent upon the machines knitting action and consequent sinker shape and movement.

The functions of cam

are:

- > Loop formation.
- > Holding down.
- > Knocking over.

Different parts of knitting machine:

Creel: Creel is used to place the cone.

Feeder: Feeder is used to feed the yarn.

Tensioning device: tensioning device is used to give proper tension to the yarn.

VDQ pulley: VDQ pulley is used to control the GSM by controlling the stitch length.

Guide: Guide is used to guide the yarn.

Sensor: Sensor is used to sense & the machine stops when any problem occurs.

Spreader: Spreader is used to spread the spread the knitted fabric before take up roller.

Take up roller: Take up roller is used to take up the fabric.

Batch Preparation process

After grey fabric inspection the grey fabric comes to the batch preparation section. It is a very important stage for production process. Batching is a process where proper planning is done for dyeing the fabric by considering the capacity of the dyeing m/c according to the sample shade. If the shade is critical than minimum amount of batching is done for an order. In batch preparation the main object is to divide the fabric weight on the machine according to the loading capacity. Another important job in this section is to reverse the fabric by **turnover** machine.

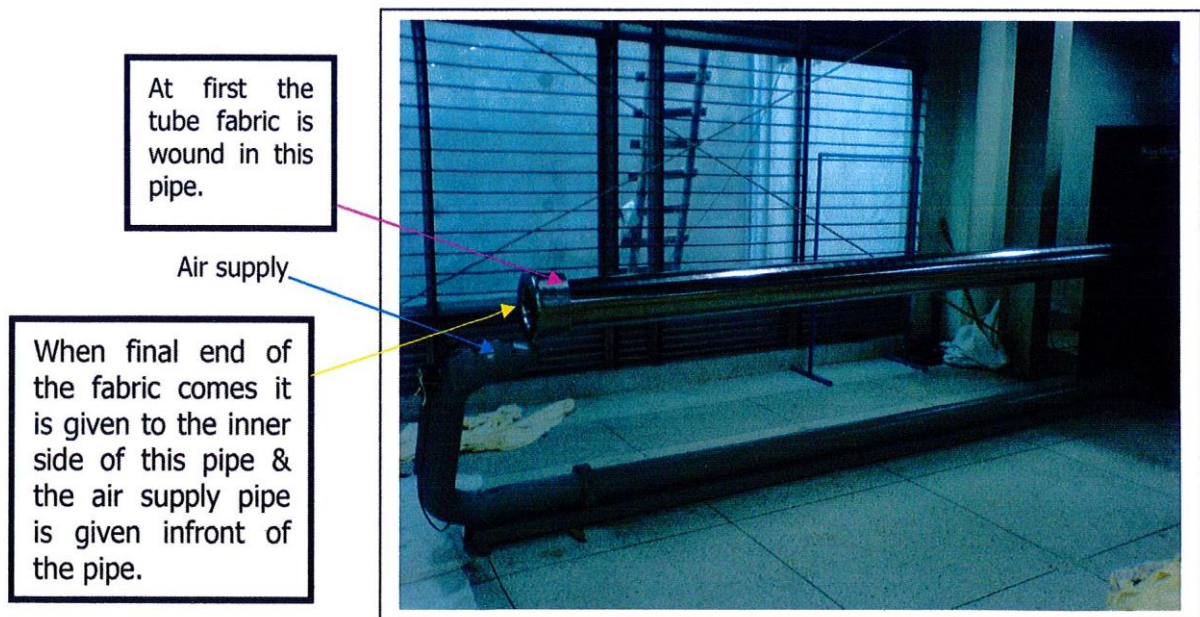
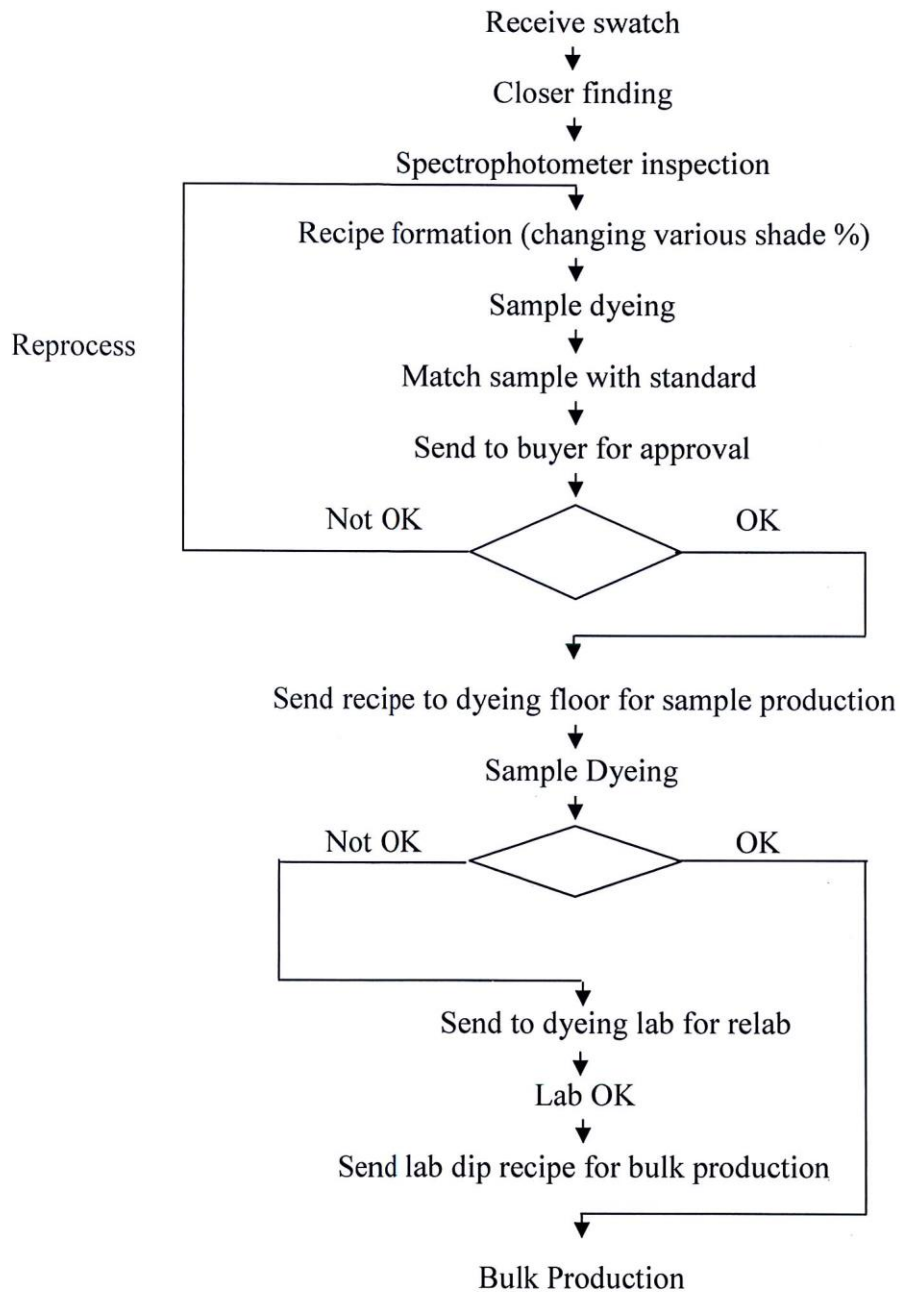


Fig: Turnover M/c

Sequence of operations in Dyeing Lab



Calculation for lab deep

For dyes the Recipe calculation formula is given below:

$$\text{Required amount of Dye} = \frac{\text{Shade \%} \times \text{Weight of the fabric in gm}}{\text{Stock solution \%}} = \frac{\text{WP}}{\text{C}}$$

Where,

W = weight of fabric, yarn,

or fiber P = shade

percentage C =

concentration of stock

solution

For auxiliaries (chemicals) the Recipe calculation formula is as below

$$\text{Required amount of solution (C.C)} = \frac{\text{g/l required} \times \text{wt of substrate} \times \text{Total liquor}}{10^x \text{ concentration (\%)} \text{ of stock solution}}$$

For addition of auxiliaries (Chemicals) in solid form the formula is given below:

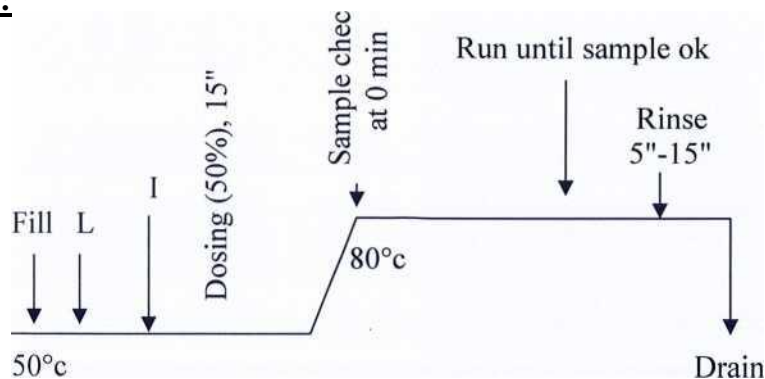
Dveina Process Flowchart **Demineralization**

SI. No.	Sqn	Chemicals	g/l
1.	X	Imerol PCLF (Wetting agent)	.250
2.		SIRRIX 2UD (Sequestering agent)	.300
3.		Green Acid	.150

Scouring & Bleaching

SI. No.	Sqn	Chemicals	g/l
1.	A	Imerol PCLF (Wetting agent)	1.0
2.	B	Geisoft CAN (Anticreasing agent)	0.5
3.		KAPPA QUEST FE (Sequestering agent)	0.5
4.	D	Geistab RS (Stabilizer)	0.5
5.	C	Caustic Soda	2-3
6.	E	Peroxide	3-8
7.	F	Green Acid	0.7

Recipe:



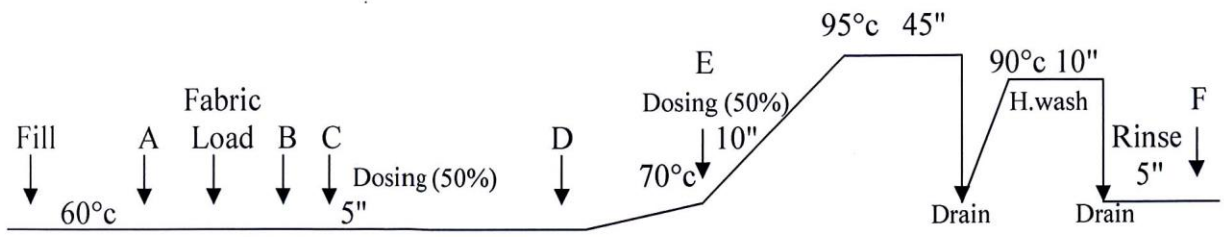
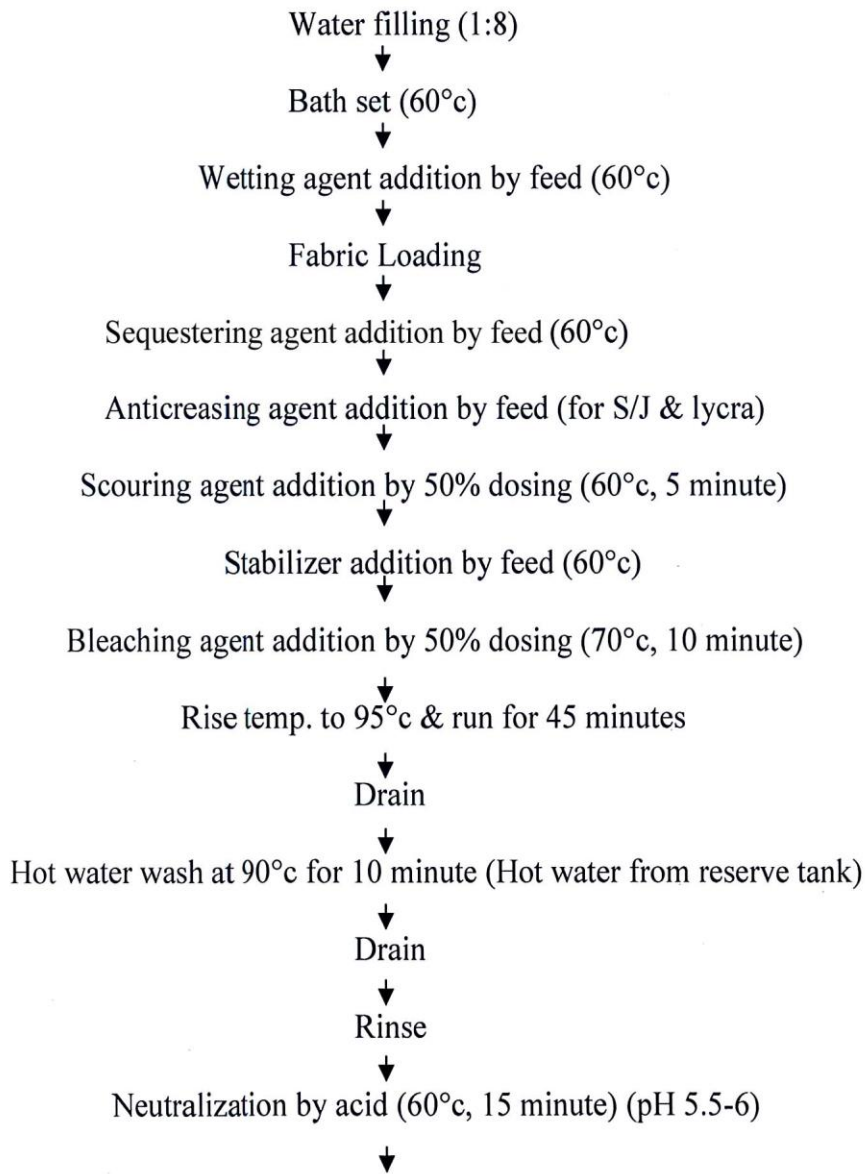


Fig: Flowchart of scouring & bleaching process

Note:

Anticreasing agent is used for S/J & lycra composed fabric. The amount of caustic & peroxide varies according to the shade variation.



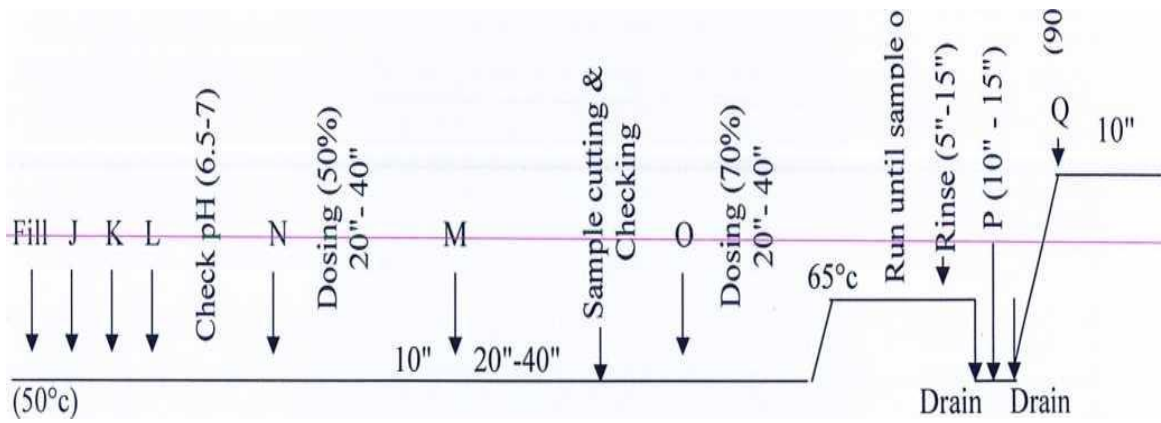


Fig: Flowchart of dyeing process (White shade)

Fig: Flowchart of Dyeing process (For Reactive color)

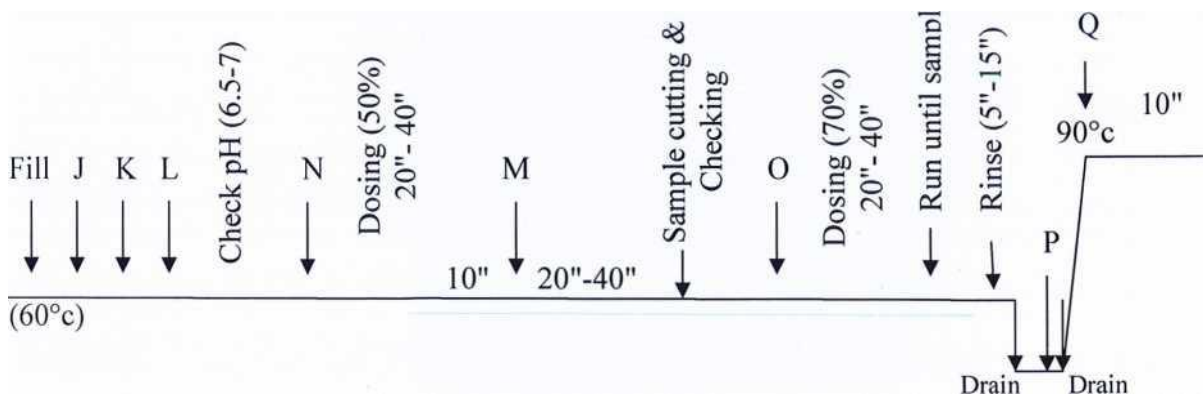
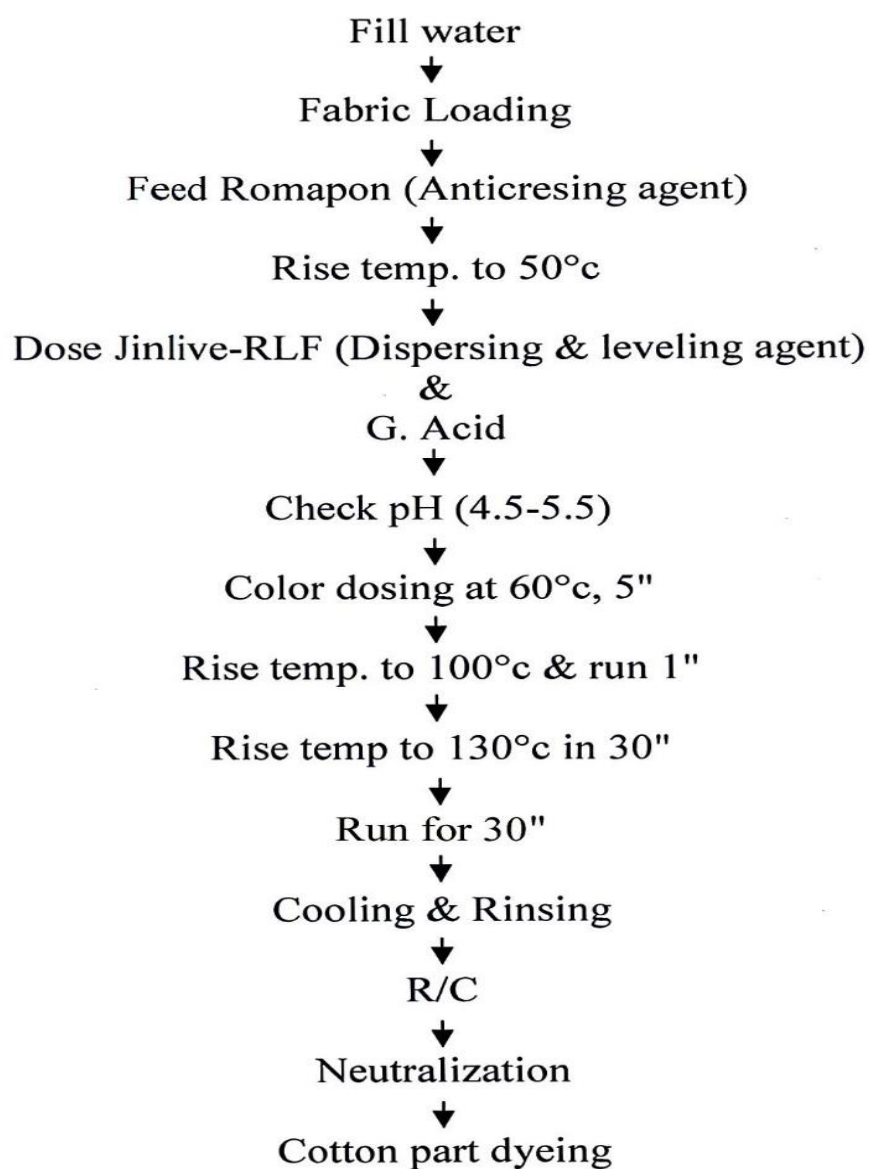


Fig: Flowchart of Dyeing process (For Drimarine color)

Flowchart of different blend dyeing process (for CVC. TC,PC etc.)



Sequence in dewatering m/c:

Dyed fabric from trolley

J box Detwister

Spreading

Fabrics pass through first padding chamber

Ballooning

Fabrics pass through second padding chamber

Spreading

Parameters in dewatering m/c:

The pressure of padding roller can be maximum 2.5 bar in J box, 5 bar in 1st padder & 4 bar in 2nd padder. The maximum r.p.m can be 80. In dewatering m/c four types of overfeed present and those are high overfeed, medium overfeed, low overfeed, diagonal overfeed.

Calculation of dewatering m/c:

GSM of fabric before J box - GSM of fabric after second padder ^{nn/}

$$\frac{\text{Total water extraction}}{\text{GSM of fabric before J box}} \times 100\%$$

Functions of drying machine:

The main function of drying machine is to dry the fabric. The temperature of the drying chamber depends on the fabric GSM & type of fabric. The m/c r.p.m of the drying m/c also depends on the fabric GSM & type of fabric.

Functions of compactor:

1. Controlling the GSM
2. Controlling the shrinkage
3. Controlling fabric diameter

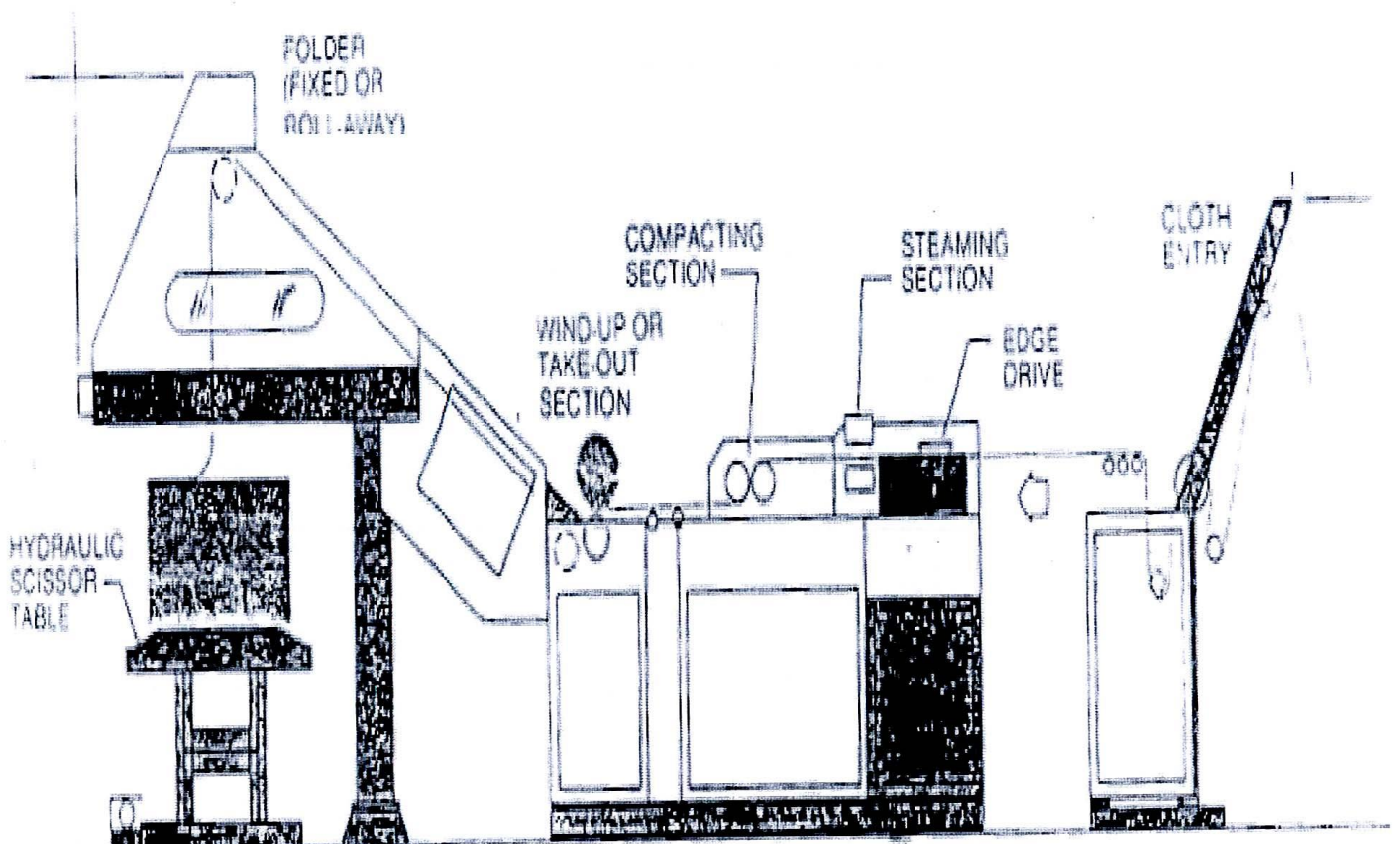


Fig: Side view of compactor m/c

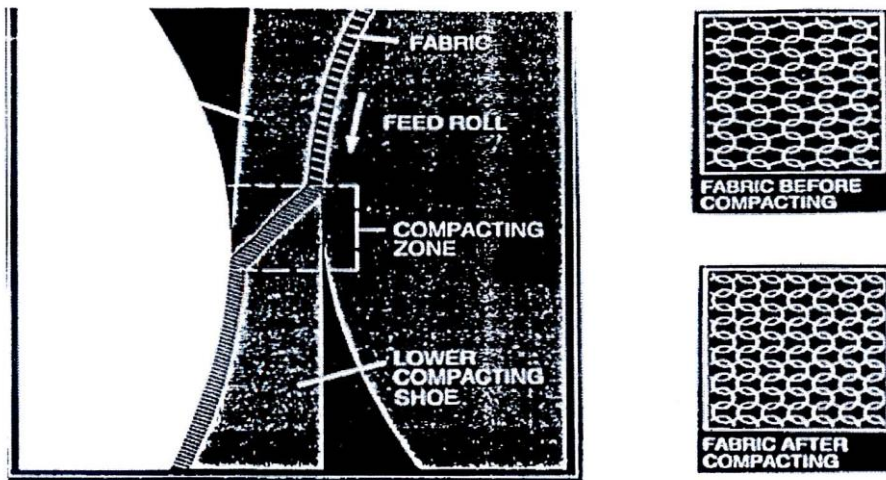


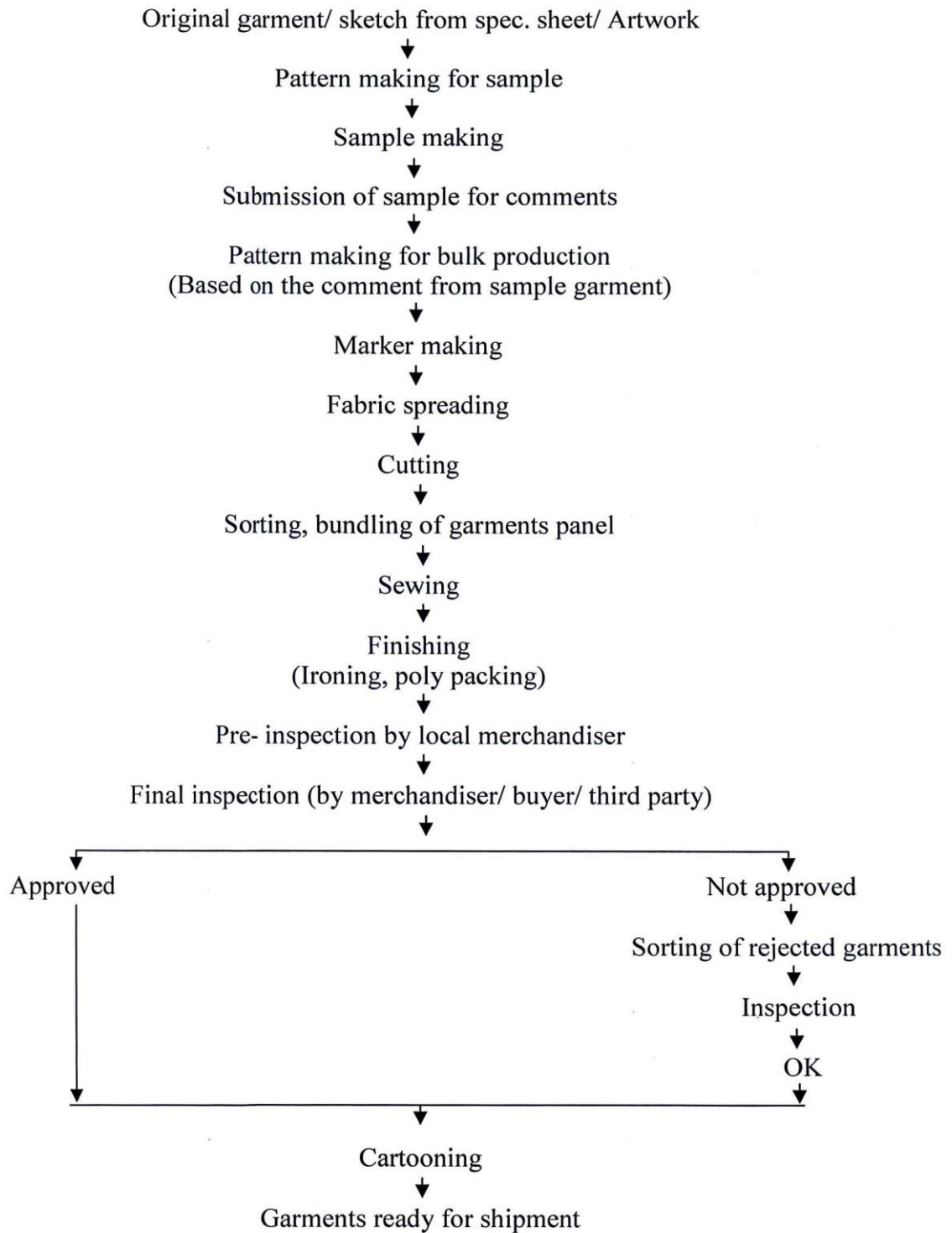
Fig: Process of compaction & the construction of fabric before & after

Calculation for controlling Shrinkage & fabric diameter in compactor:

For controlling the fabric diameter & shrinkage running diameter is set on the compactor m/c. After drying the fabric diameter is calculated & the shrinkage (length & width) is calculated.

$$\text{Running dia} = \text{After dryer dia} + \text{Width shrinkage \%} + 5\%$$

Garments process flowchart



Grey Fabric Inspection

SI. No.	Faults in fabric	SI. No.	Faults in fabric
01.	Hole	11.	Drop stitch
02.	Oil stain	12.	Dirt
03.	Grease stains	13.	Needle line
04.	Sinker line	14.	Thick Thin place
05.	Hole / Pin Hole	15.	Missing yarn
06.	Yarn contamination	16.	Barre
07.	Slub	17.	Sattap
08.	Wheel mark	18.	Broken needle
09		19	
10.	Double yarn	20.	Foreign materials

0 - 3 " = 1 Point

3" -6" = 2 Point

6" - 9" =3 Point

More than 9" = 4 Point

<40 POINTS - A

40-60 POINTS - B

Trouble shooting checklist

Probable cause

1. Bad needle.
2. Take down mechanism too tight.
3. Gating off causing needles to rub
4. High tension on the yarn
5. Bad yarn
6. Needle too tight in their slot
7. Dial height too low or high
8. Badly tight knots
9. Needle timing set wrong
10. Improper stitch setting
11. Carriers set wrong
12. Yarn threaded wrong
1. Take down mechanism too loose
2. Defective needles
3. Improperly set yarn carriers
4. Improper stitch setting
5. Fabric too loose
6. Not enough tension
7. Dial height too high
8. Positive feed slippage
9. Needle timing set wrong
10. Yarn tension too loose
11. Needle tricks clogged
12. Dial latch closing under yarn carrier
13. Dial latch closing near heel carrier

1. Defective needles
2. Dirt in needle slots
3. Bad trick walls
4. Needle too loose or tight
5. Needles not getting enough oil
6. Getting off
7. Needle getting too much oil
1. Bad yarn
2. Uneven tension
3. Positive feed yarn slippage
4. Improper stitch cam setting
5. Uneven dial & cylinder relationship
6. Uneven take down pull
1. Needle set wrong
2. Bad or old needles
3. Yarn carrier set wrong
4. Dirt in needle tricks and cam sections
5. Worn cam surface
6. Loose cam
7. Cam improperly set
8. Bad yarn running into machine
9. Wrong size yarn for needles
10. Fabrics too tight
11. Take down mechanisms too tight
12. Excessive tuck in
13. Dial too low
14. Extreme yarn tension

Finished fabric inspection

SI. No.	Inspection parameter	SI. No.	Inspection parameter
01.	Hole	11.	Running shade
02.	Oil stain	12.	Shade variation
03.	Chemical stain	13.	Needle line
04.	Sinker line	14.	Grain line
05.	Water spot	15.	Machine stoppage
06.	Yarn contamination	16.	Bar re
07.	Slub	17.	Bowing
08.	Hairiness	18.	Crease mark
09.	Dirt stain	19.	Fly yarn
10.	Color & softener spot	20.	Foreign materials

0 - 3 " = 1 Point

3" - 6" = 2 Point

6" - 9" =3 Point

More than 9" = 4 Point

<40 POINTS - A

40-60 POINTS - B

Utility Services

Etp (Effluent Treatment Plant) & Wtp (Water Treatment Plant)

Treated waste-water, thus obtained from the plant will be practically color less and will be suitable for discharge into the sewerage/main drain/agricultural field.

1. Power

System (Generator):-

Brand: Cater Pillar

(1200 KVA, 1030

KW)

2. Water Sources:-

DEEP TUBE-WEL.

3. Boiler:-

DESCRIPTION	BRAN	ORIGIN	CAPACITY	NO. OF M/C
COMPLETE STEAM BOILER	Cleave Brooks	USA	10 TONS/DAY	2 NOS.

Cost Analysis

Price list of knit fabrics

SI. No.	Fabric	Price (Per kg)
1.	Single jersey	8.00
2.	Lycra S/J	28.00
3.	Strip S/J	18.00
4.	PQ	14.00
5.	Lycra PQ	22.00
6.	Double PQ	14.00
7.	1x1 Rib	14.00
8.	1 x 1 Lycra Rib	25.00
9.	2x1 Rib	18.00
10.	2x1 Lycra Rib	30.00
11.	Place Rib	25.00
12.	Interlock	18.00
13.	Strip Rib	23.00
14.	Flat Back Rib	25.00
15.	5x5 Rib	28.00
16.	F/T	18.00
17.	Lycra Terry Fleece	30.00
18.	Lacost	14.00
19.	Double lacost	14.00

Chapter-4

Impact of Internship

Discussion

Crystal Composite Ltd. is a joint venture limited company with composite knitwear manufacturer & exporter. The Crystal Composite Ltd. is committed to the best human workplace practices. Their goal is to continuously improve their Human resource policies and procedures through education, training, communication and employees involvement. Right from inception the policy of the company has been to provide total customer satisfaction by offering quality knitwear in time. Working on new concepts in styling & content of the knitwear is a continuous activity in Crystal composite Ltd. with an objective to up the quality and the value of merchandise. To meet the commitments of quality and prompt delivery, Crystal Ltd. Decided to integrate the manufacturing process in a planned manner. Over the years the entire process has been integrated by importing sophisticated machinery from world-renowned manufacturers. For achieving their goal, Crystal composite Ltd. has recruited a high profiled human resource team. The production is controlled by technical persons. All of the decision

The goal of Crystal Composite Ltd. is to get high production & to maintain the quality of the product at a minimum cost. There is no polar fleece & auto stripe m/c in Crystal composite Ltd. so Crystal Ltd. is not able to produce all types of knit structure. There is no person to input the self shade of different types of lot everyday in the spectrophotometer but for accuracy of the recipe it is very important to input the self shade of different lot of dyes in a regular basis. In dyeing lab Crystal Ltd. is using digital system but if they use dispense type digital pipeting system I think their accuracy will increase to a maximum level. For dyeing they are using fongs m/c but if they use thies or sclabos m/c I think their product quality will be higher. In garments section for cutting they are using manual straight knife cutting m/c but if they use computerized cutting m/c their accuracy will increase & their efficiency will increase to a maximum level. I think if they improve the above things I think their product quality, their efficiency & their accuracy will be maximum.

The term is “textile” derived from the Latin *textilis* and the French *texere*, meaning “to weave,” and it originally referred only to woven fabrics. It has, however, come to include fabrics produced by other methods. Thus, threads, cords, ropes, braids, lace, embroidery, nets, and fabrics made by weaving, knitting, bonding, felting, or

tufting are textiles. Some definitions of the term textile would also include those products obtained by the papermaking principle that have many of the properties associated with conventional fabrics. In addition to clothing and home furnishings, textiles are used for such industrial products as filters to air conditioners, life rafts, conveyor belts, tents, automobile tires, swimming pools, safety helmets and mine ventilators.

From fiber to fabric, The Crystal CompositeLtd. is truly integrated undertaking. The Crystal Ltd. has the capability to offer a complete product range for the export textile markets. The goal of the Crystal group Ltd. is to become the preferred partner for sourcing high quality fabrics and clothing from Bangladesh With highly advanced technology and an emphasis on developing local human resources. The Crystal CompositeLtd. has the potential to make an important contribution to the nation's growing ready made garments export sector.

The rational behind the existing structure and future expansion of the Crystal Composite Ltd. is to capture value-added at each stage of the textile manufacturing process. Despite Bangladesh's lack of indigenous cotton production capability, Crystal CompositeLtd. has leveraged Bangladesh's labor cost advantage and export competitiveness to the maximum.

CHAPTER-5

CONCLUSION

Now-a-days Textile field becomes very competitive & the buyer wants 100% quality product. For this reason it is very important to know about the latest technologies in textile sector. To produce a quality product, as a textile engineer I must have a vast knowledge about the production parameters & how to produce a high quality product. To accommodate the theoretical study with technical and practical things industrial training (Internee) is very important. In my training period I have observed that Crystal Composite Ltd. produce high quality fabric and fulfill the special requirements from the different types of buyers by following different internationally recommended standard method. In my training period I have learned many things such as different types of machines and their functions, techniques of productions and the management system. In this training period I have also learned how the desired product is made ready for shipment from the starting to the end i.e. from merchandising to the packaging. In this training period I have got an idea about the responsibility of different departments of the factory. So I think this industrial training will help me in future.

