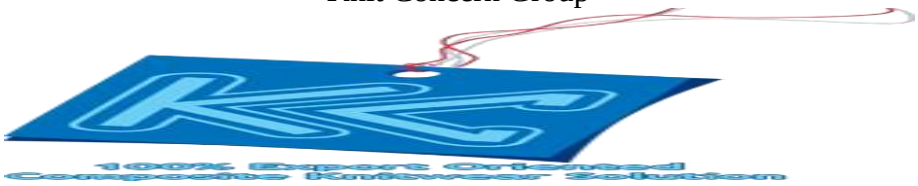
“INDUSTRIAL TRAINING REPORT”

Knit Concern Group



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FALL 2014

ACKNOWLEDGEMENT

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

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 **Sumon Mazumder**, 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, and 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 **Knit Concern Group**, 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.

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EXECUTIVE SUMMARY

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EXECUTIVE SUMMARY

This report presents a conception of Textile sector especially of a knit composite industry and tries to clarify the overall processes required to complete a garment from threads. Two months long training is not enough to capture all the information related to textile but it is possible to overview of all the departments. **Knit Concern Group** is a large group in where it is impossible to gather information about all the departments. The factory has a nice system for the internship students that are the training schedule provided by the authority. There are several departments in **Knit Concern Group** of them knitting, knit dyeing, yarn dyeing, yarn printing and merchandising department are the major ones. There are also other departments those act as supporting of them. This report illustrates that how a thread or yarn is prepared for fabric manufacturing and fabric for garments. It also describes about the activities of each departments and the relation among the departments. Training schedule is prepared in such a way that helps a learner to know that to produce a garment which department works first and correspondingly which works at last. This paper includes from where order is received and to where it is supplied and how a large scale of products is produced within a very short period of time. Different types of order are running on the same time on a same floor with different types of garments from several buyers. But there is no miss match of any product except some cases which are removed by inspection. This Paper concludes by identifying some important information about different department that help the factory to grow up quickly with large amount of profit with environment friendly technologies. This report may be a guideline for other small industries to become large in size and for students or other people to learn a little about a knit composite industry without visiting. We have started our 2 months internship in 1st September 2014 and have successfully completed in 30th October 2014.

CHAPTER 02

GENERAL INFORMATION OF THE COMPANY

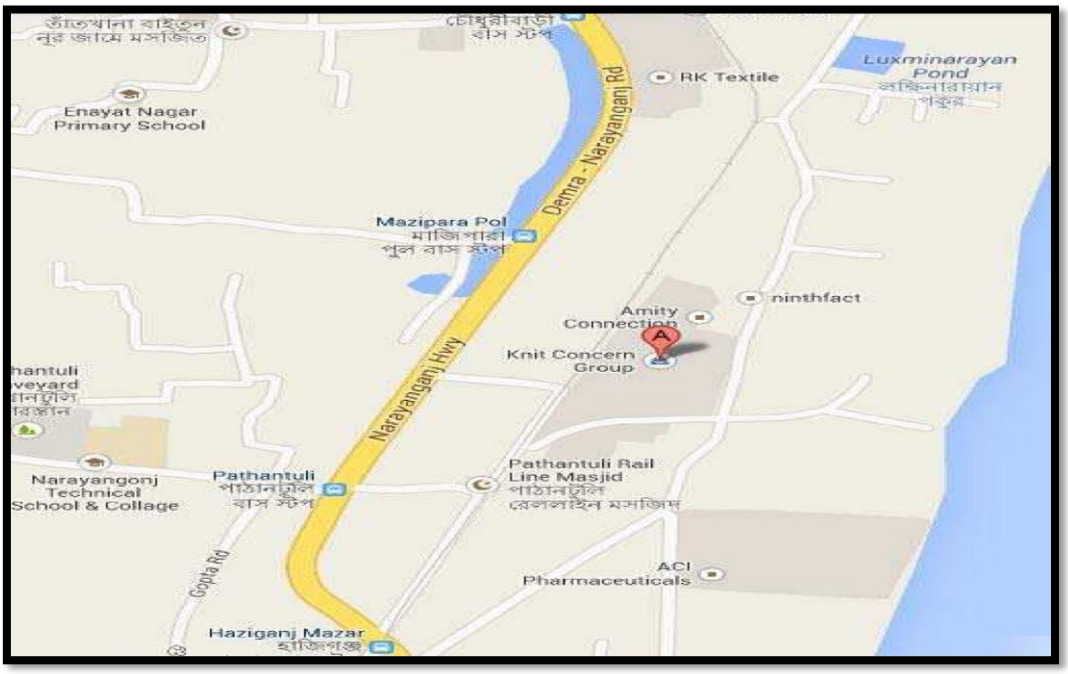
CHAPTER 02

GENERAL INFORMATION OF THE COMPANY

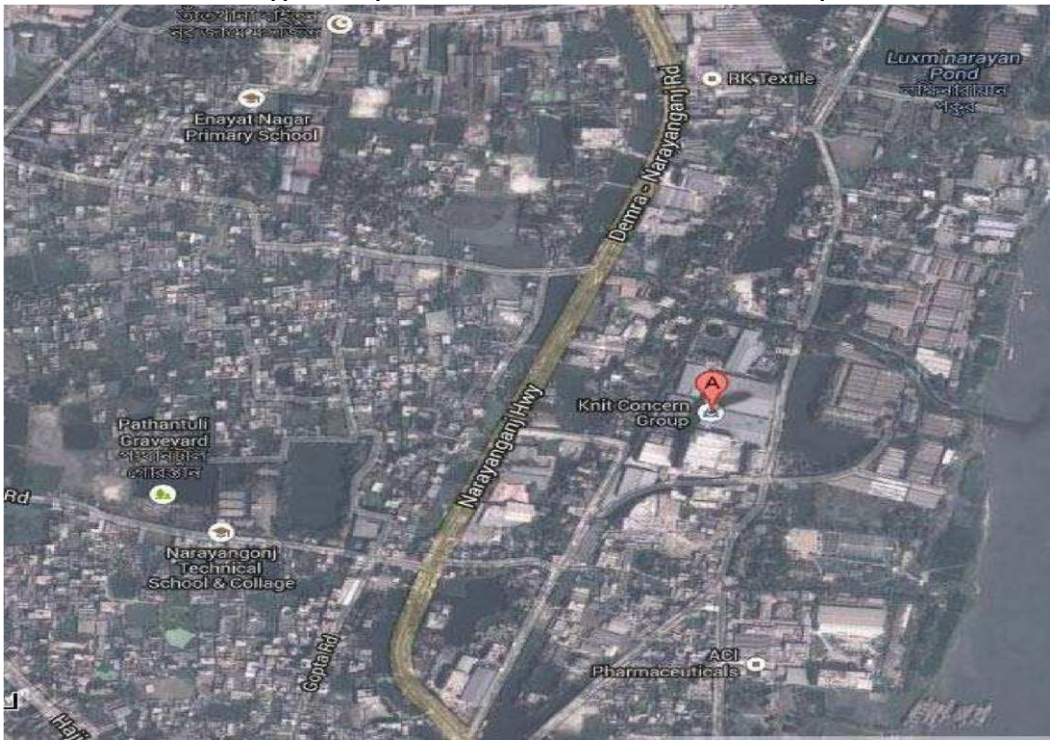
Name of the Company	Knit Concern Ltd.
Type	100 % Export Oriented Composite knitwear Industry
Factory Address:	62,Water Works Road Godnail,Narayangonj-1400 Bangladesh
Contact No	027631086, 027645641
Fax	027641087
E-mail Address	info@knitconcern.com
URL	http://www.knitconcern.com
Person to be contact	Mr. Jahangir Alam (Managing Director)
Year of Establishment	1990
Business	100% export oriented knit fabrics manufacture & readymade knit garments exporter
Products	Knit Fabrics & Knit Garments
Production capacity	Knitting: 35 tons/day Dyeing & Finishing: 35 tons/day
No. Of employees	350
No. Of workers	3000
Legal Form of Company	Private Limited Company.

2.1.Location Of KCL

Knit Concern Limited is located at Godnail, in Narayanganj about 18 km from the EPZ.



Google Maps View of Knit Concern Group



Satellite View of Knit Concern Group

Knitting Section:

Production capacity: approximately 3**5 ton/day**

Knit Dyeing Section:

It has two section of knit dyeing floor – KCL (old floor) & KCA (new floor). Each contains around 100 thousands square ft area.

Production capacity: approximately **50 ton/day**

Yarn dyeing section:

AREA: 100 thousands sq. fit.

Floor: MULTI-STORED FLOOR (25,000 sq.ft/floor).

PRODUCTION: **25 Tons/day**

2.2.Different Departments

Production Oriented Department:

- Yarn store
- Planning & Control
- Batching
- Chemical store
- Winding section
- Dyeing Section
- Finishing Section
- Dyeing lab section
- Wet lab
- Quality Control
- Maintenance
- Utility
- Water treatment plant
- Effluent treatment plant

Supporting department:

- Prochurement
- Merchandising
- Marketing
- IT
- HRD

- Finance & accounting
- Medical
- Personnel Administration
- Security

2.3 Other Facilities

Staff canteen:
The canteen is capable to accommodate about 250 persons at a time.

Mosque:
The mosque is capable to accommodate about 500 persons at a time.

Medical:
Available Facilities with a Air Conditioned Ambulance.

Lighting:
Sufficient lighting arrangement is there with proper lighting shade fixed along with overhead channel

Cleanness:
The factory premise are kept clean, removing the dirt & refuges, cleaners sweep the floor at regular interval effective arrangement are made to dispose of the waste to the nearby dustbin.

Water:
Sufficient water is supplied from in house deep-tube-well to all production lines including toilet. Moreover, each floor provided with tank for portable water.

Toilet:

Sufficient numbers of toilets are available for male & female workers as per requirements. Soaps & towels are also supplied.

Emergency Electricity Supply:
During the electricity failure, available generators can fulfill requirement of the whole complex.

2.4 Achievement

Knit Concern now is having Oeko Sustainable Textile, i.e., Oeko-Tex Standard 100, which, as you know, entrusts it to produce apparels using organic cottons cultivated and traded conforming to eco-friendly standards all through.

On May 1, 2010, the Ministry of Labor, Government of Bangladesh, has honored Knit Concern with the May Day Award 2010 for the top order ranking as a labor-friendly knit factory in the country.

Besides numerous local and overseas top order business as well as CSR awards and recognitions, many of those - such as the 'Premium Quality Supplier' etc - being offered by its valued buyers and some business and financial publication houses highly noted in the country, the government also has awarded Knit Concern the national trophies several times for performing as the top and the best exporter of knit apparels.

On its way towards success, **Knit Concern** implemented ISO- 9001:2008 Quality Management System back in 2002.

Knit Concern is also certified by CONTROL UNION.INDIA to manufacture garments using organic cotton yarn under the prestigious coverage of scope CERTIFICATE.

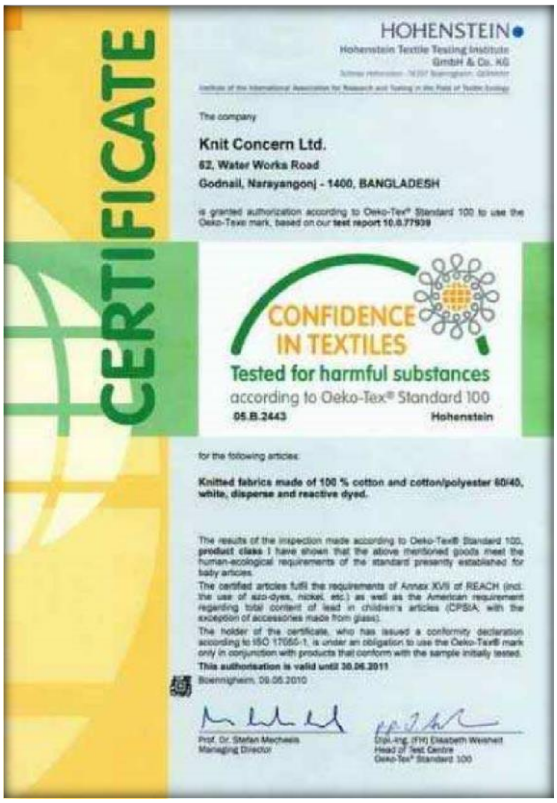
BGMEA	
BKMEA	
OEKO-TEX	

CERTIFICATE


Orion Registrar, Inc., USA
Certificate of Registration
This is to certify the Quality Management System of
Knit Concern Ltd.
62 Water Works Road
Godnail, Narayanganj-1400
Bangladesh
Has been assessed by Orion Registrar and found to be in compliance with the following Quality Standard
ISO 9001:2008
The Quality Management System is Applicable to:
Designing and Manufacturing of Composite Garments
The Registration period is from September 30, 2009 to November 17, 2011
This registration is subject to the company maintaining its system to the required standard, and applicable exceptions, which will be monitored by Orion.
Client ID 00390-60001 Certificate ID 10006476-4
ANAB ACCREDITED
President
Date
IAF
Orion Registrar, Inc. ★ Arvada, Colorado ★ PO Box 745070 ★ 303-456-6010 ★ FAX 303-456-6681


CERTIFICATE
Knit Concern Ltd.
Narayanganj, RANGLADESH
Project in: BANGLADESH
Valid until: 08 July 2010
CONTROL UNION CERTIFICATIONS

ISO Certificate **Organic Certificate**


CERTIFICATE
HOHENSTEIN
Hohenstein Textile Testing Institute GmbH & Co. KG
The company
Knit Concern Ltd.
62, Water Works Road
Godnail, Narayangonj - 1400, BANGLADESH
is granted authorization according to Oeko-Tex® Standard 100 to use the Oeko-Tex® mark, based on our test report 10.0.77939
CONFIDENCE IN TEXTILES
Tested for harmful substances
according to Oeko-Tex® Standard 100
05.B.2443 Hohenstein
for the following articles:
Knitted fabrics made of 100 % cotton and cotton/polyester 60/40, white, disperse and reactive dyed.
The results of the inspection made according to Oeko-Tex® Standard 100, product class I have shown that the above mentioned goods meet the human-ecological requirements of the standard presently established for baby articles.
The certified articles fulfil the requirements of Annex XVII of REACH (incl. the use of azo-dyes, nickel, etc.) as well as the American requirement regarding total content of lead in children's articles (CPSIA; with the exception of accessories made from glass).
The holder of the certificate, who has issued a conformity declaration according to ISO 17050-1, is under an obligation to use the Oeko-Tex® mark only in conjunction with products that conform with the sample initially tested.
This authorisation is valid until 30.06.2011
Boennigheim, 09.06.2010
Prof. Dr. Stefan Mecheels
Managing Director
Dipl.-Ing. (FH) Elisabeth Wesnet
Head of Test Centre
Oeko-Tex® Standard 100


Certificate of Appreciation
Knit Concern Ltd.
a Member of Bangladesh Knitwear Manufacturers & Exporters Association (BKMEA)
has achieved the award of a "Best Workers' Friendly Knitwear Industry 2010"
(Md. Fazlul Hoque)
President
Bangladesh Knitwear Manufacturers & Exporters Association
(Md. Nurul Haque)
Secretary In-charge
Ministry of Labour and Employment

Oeko -Tex Certificate **1st May Fair Certificate**

2.5 List of Major Buyers

Buyers Name	Sign
H & M	
Okaidi	
Jules	
CAMAIEU	
KLiNGEL	

Carrefour	
Sayan	
K & L	
A M S	
Phildar	
W E	

CHAPTER 03

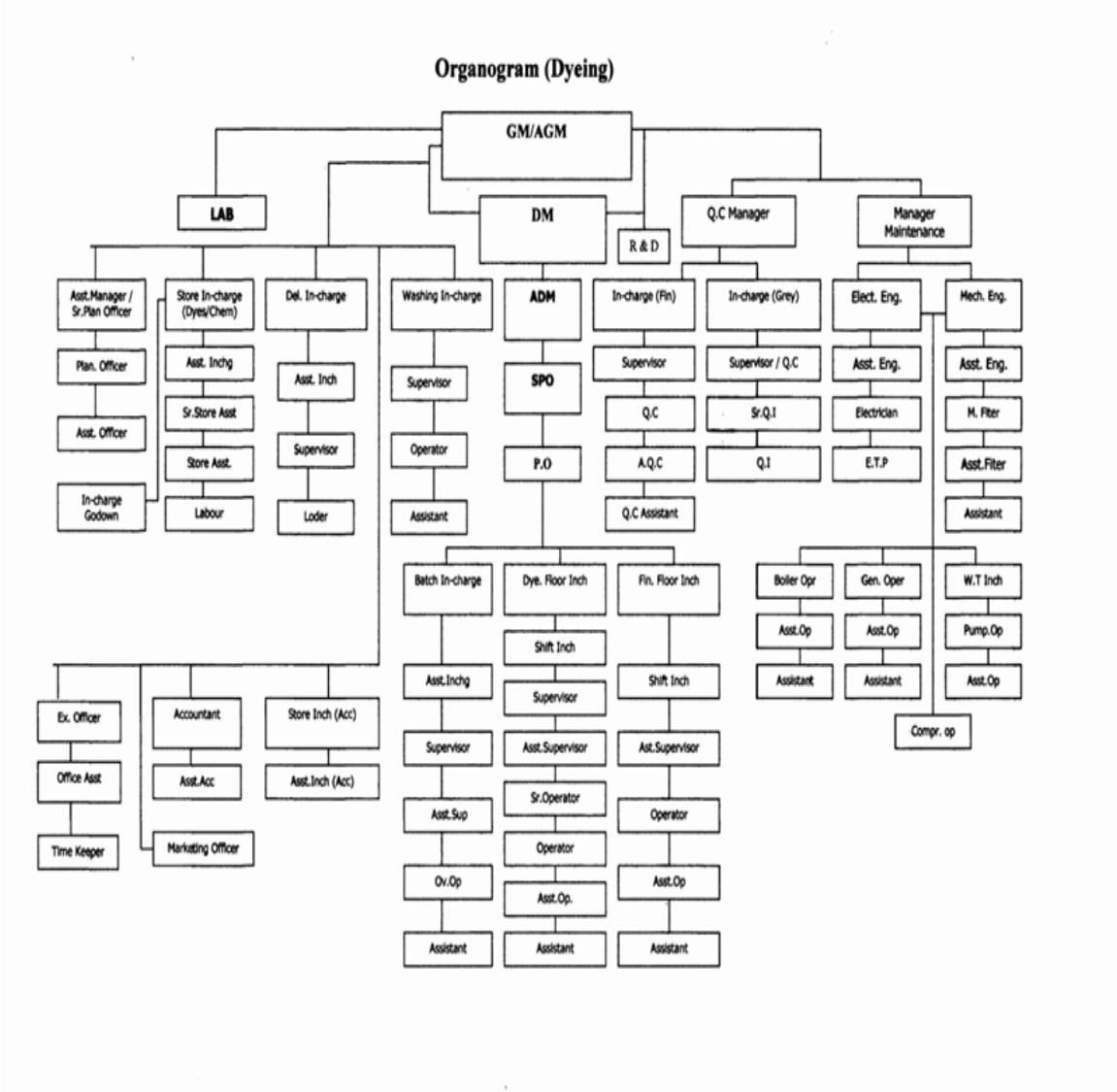
DETAILS OF THE COMPANY

CHAPTER 03

DETAILS OF THE COMPANY

3.1.Human Resource Management

3.1.1. Organogram Of Man Power In Dyeing Section



3.1.2. Management System

→Buyer sample is send to G.M.

→Matching is done by lab in charge.

→Sample is prepared by asst. dyeing master.

→Sample is send to the buyer for approval.

→Approved sample is returned and taken as standard. Sample for bulk production.

→Asst. dyeing master gives responsibilities to production officer.

→Then production officer, with the supervisors start bulk production.

→On line and off line quality check is done by lab in charge and asst. dyeing master.

→After dyeing finishing in charge controls the finishing process with the supervision of production officer.

→After finishing, the material is checked by asst. dyeing master.

→Finally G.M. checks the result with asst. dyeing master and decision is taken for delivery.

Shift Change:

Two shifts (day and night): each of 12 hrs
Day shift→ 8 a.m. to 8 p.m.

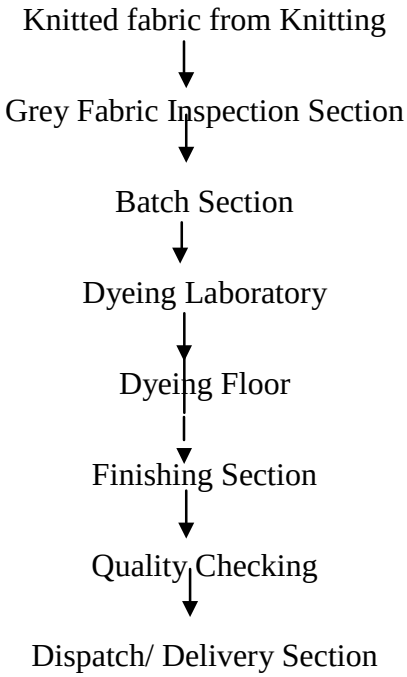
Night shift→ 8 p.m. to 8 a.m.

Manpower List (Dyeing Department):

DEPARTMENT	**MANPOWER**
knitting	733
Knit Dyeing	813
Yarn Dyeing	288
Washing	45
Finishing	7112
Garments & Printing	50
Merchandising	117
Maintenance	56
Administration	47

Utility	96
Security	88
Total	**9445**

3.1.3. Flow of Operation

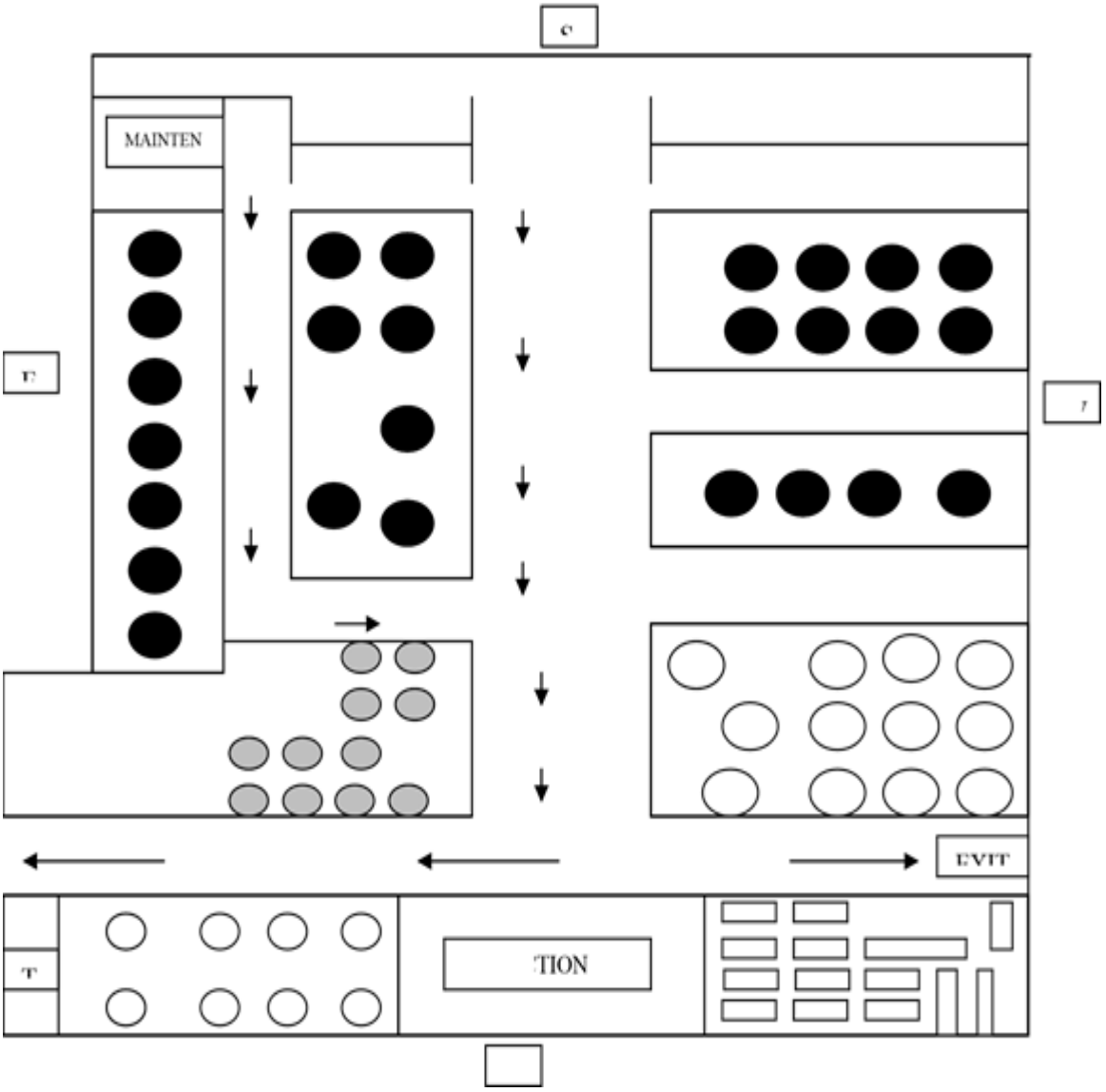


3.1.4. Supporting Section

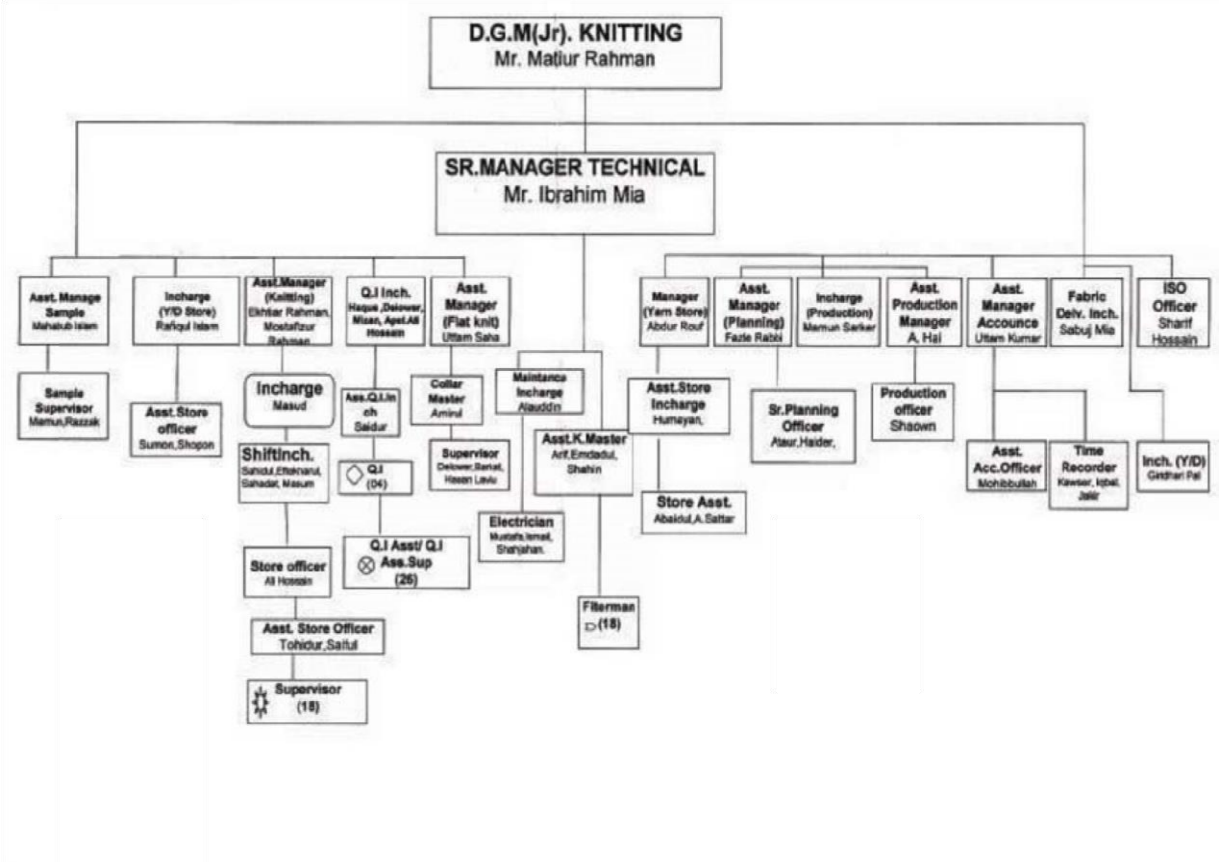
- ✓ Planning
- ✓ Chemical store
- ✓ Utilities Sections – water, power, boiler, compressor, waste water management system.
- ✓ Maintenance Section

3.2.Knitting Section

3.2.1. Knitting Layout



3.2.2. Organogram



3.2.3. Machine Description

Single jersey

m/c no.	Diameter	Brand	Origin	Type	Gauge	Feeder	Quantity	Lycra-Attachment
1	15	Orzio	Italy	S/J	24	45	1	No
2	16	Fukuhara	Japan	S/J	24	48	1	No
3	17	Orzio	Italy	S/J	24	51	1	No
4	18	Fukuhara	Japan	S/J	24	54	1	No
5	19	Orzio	Italy	S/J	24	57	1	No
6	20	Fukuhara	Japan	S/J	20/24	60	1	No
7	21	Fukuhara	Japan	S/J	20/24	63	1	No

8	22	Fukuhara	Japan	S/J	20/24	64	1	No
9	23	Fukuhara	Japan	S/J	20/24	69	1	No
10	24	Fukuhara	Japan	S/J	20/24	72	1	No
11	26	Fukuhara	Japan	S/J	20/24	78	1	Yes
12	28	Fukuhara	Japan	S/J	20/24	84	1	Yes
13	30	Fukuhara	Japan	S/J	20/24/ 82	90	1	Yes
14	30	Fukuhara	Japan	S/J	20/24/ 28	90	1	Yes
15	30	Fukuhara	Japan	S/J slitting	20/24/ 28	90	1	Yes
16	30	Fukuhara	Japan	S/J slitting	20/24/ 28	90	1	Yes
17	32	Fukuhara	Japan	S/J slitting	20/24/ 28	96	1	Yes
18	32	Fukuhara	Japan	S/J slitting	20/24/ 28	96	1	Yes
19	34	Fukuhara	Japan	S/J slitting	20/24/ 28	102	1	Yes
20	34	Fukuhara	Japan	S/J	20/24/ 28	102	1	Yes
21	36	Fukuhara	Japan	S/J	20/24/ 28	118/108	1	Yes
22	36	Fukuhara	Japan	S/J	20/24/ 28	118/108	1	Yes
23	38	Fukuhara	Japan	S/J	20/24/ 28	114/122	1	Yes
24	38	Fukuhara	Japan	S/J	20/24/ 28	114/122	1	Yes

25	38	Fukuhara	Japan	S/J	20/24/28	114/122	1	Yes
26	40	Fukuhara	Japan	S/J	20/24	120	1	Yes
27	42	Fukuhara	Japan	S/J	20/24	120	1	Yes
28	34	Fukuhara	Japan	S/J slitting	24/28	110	1	Yes
29	25	Fukuhara	Japan	S/J	20/24	75	1	No
30	26	Fukuhara	Japan	S/J	20/24	78	1	No
31	30	Mayer & Cffi	Germany	S/J slitting	20/24/28	96	1	Yes

Fleece

252/253	28	Fukuhara	Japan	3-Thread fleece	16/20	84	2	Yes
254/255	30	Fukuhara	Japan	3 Thread fleece	16/20	90	2	Yes

Rib/Interlock

101	30	Well	Taiwan	Rib	18	52	1	Yes
102	30	Fukuhara	Japan	Rib/Interlock	18/22	60	1	Yes
103	33	Fukuhara	Japan	Rib/Interlock	18	60	1	Yes
104	33	Fukuhara	Japan	Rib/Interlock	16/18/22	60	1	Yes
105/106	34	Fukuhara	Japan	Rib/Interlock	18/22	60/62	2	Yes
107	36	Fukuhara	Japan	Rib/Interlock	18/22	60	1	Yes
108	36	Fukuhara	Japan	Slock	16/18/22	60	1	Yes
109	38	Fukuhara	Japan	Slock	18/22	64	1	Yes

110/111	38	Fukuhara	Japan	Rib/Interlock	18/22	68	2	Yes
112/113	40	Fukuhara	Japan	Slock	14/16/18	68	2	Yes
114/115	42	Fukuhara	Japan	Rib/Interlock	18/22	72	2	Yes

Interlock

151	30	Fukuhara	Japan	Interlock	22	108	1	No
152/153/154	36	Fukuhara	Japan	Interlock	22	120	3	No
155 to 158	38	Fukuhara	Japan	Interlock	22	126	4	No
159	50	Lisky	Taiwan	Interlock	18/22	180	1	No

Single Jersey Auto Striper

201/202/203	30	Fukuhara	Japan	Auto Striper 4 Color	16/20	48	3	No
205	30	Fukuhara	Japan	Auto Striper 6Color	20/24	42	1	Yes
204	34	Fukuhara	Japan	Auto Striper 4 Color	20	48	1	No

Rib/Interlock Auto Striper

226	33	Fukuhara	Japan	Auto Striper 4 Color	18/24	48	1	Yes
227		Fukuhara	Japan	Auto Striper 4 Color	18/24	48	1	Yes

Rib Eyelet

251	30	Jinhar	Taiwan	Rib Eyelet	16	32	1	No

Flat Knit m/c

Serial No.	Brand	Gauge	Type	Origin	Quantity	Lycra Attachment
1	Flying Tiger	14	Full Jacquard	Taiwan	1	No
2-3	Stoll	14	Semi Jacquard	German	2	Yes
4-8	Sffima Seki	14	Computerized	Japan	5	No

3.2.4. Raw Materials

The basic yarns used here are-

1. Cotton
2. Polyester
3. P/C blend
4. CVC
5. Organic cotton
6. Lycra
7. Grey melange
8. Ecro melange
9. Nylon

Suppliers of yarn:

1. India
2. Delta Spinning
3. Hanif Spinning
4. Nahid Spinning
5. Square Textile

3.2.5. Types of Fabric

The following types of fabric are available in knit concern group

1. Single jersey
2. Double jersey
3. Pique
4. Pique lycra
5. 1x1 Rib

6. 2x2 Rib
7. Single jersey with lycra
8. Interlock
9. 92 Drop rib
10. Waffle
11. Terry
12. Fancy Terry
13. Rib with lycra
14. And many more

3.2.6. Passes Of Yarn In Circular Machine

Creel
↓
Cone
↓
Tube
↓
Knot Catcher
↓
Magnet Pressure
↓
Sensor
↓
NX-Ceramic Eye Pot
↓
Yarn Wheel
↓
Guide
↓
Sensor Guide
↓
Ceramic eye pot (Feeder ring)
↓
Feeder

3.2.7. Some Fabric Sample

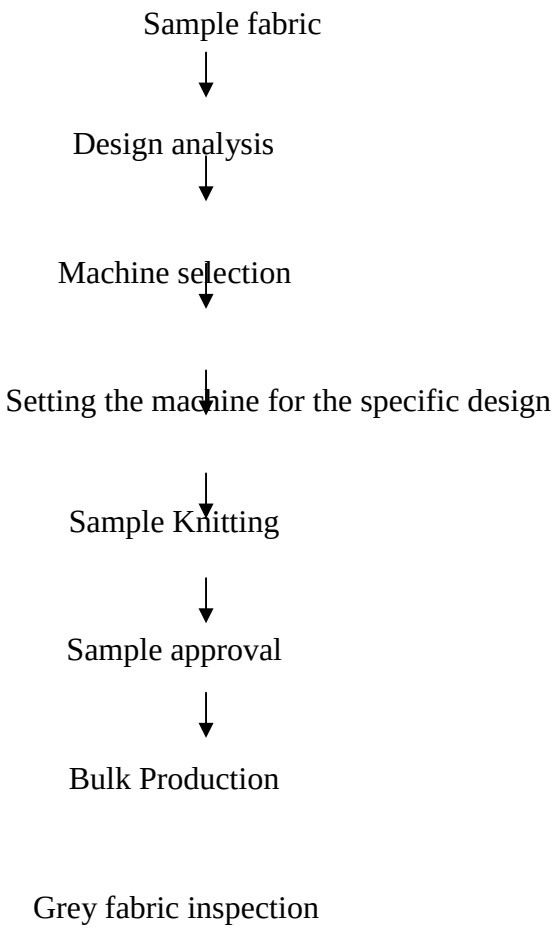
Single jersey	2×2 rib	Interlock (all over print)
Reversible	Terry	Fleece
Single lacoste	Double Lacoste	Waffle
Single jersey (slub)	Single jersey yarn dyed	Single jersey with lycra

3.2.8. Production and Calculation

Production parameters:

- Machine diameter
- Machine RPM
- No. of feeds or feeders in use
- Machine Gauge
- Count of yarn
- Required time
- Machine running efficiency

Production flow chart of knitting section:



Monthly Average Report:

Daily production is approximately 7000KG.

So, it is seen that monthly average production of this factory is 7000*30=210000 KG.

Monthly Efficiency:

Daily Production= 7000 kg

Approximate daily production capacity= 10000 Kg

So, monthly production= 7000*30 kg

Monthly production capacity= 10000*30 kg

Then, monthly production efficiency= (7000*30*100)/ (10000*30) = 70%

Fabric GSM Calculation:

Formula-1: 590.5 x Type of fabric/ S.L. / Yarn count

Formula-2: GSM= (CPI x WPI x Tex x S.L.)/100

3.2.9. Knitting Faults

- Spirality
  - Course spirality caused by multiple feeds on a circular knitting machine.
  - Wales spirality caused by the use of yarn hat is twist lively.
- Crease Mark / Edge Mark
  - Yarn tension variation
  - Lower GSM of fabric
  - Foully fabric takes up etc.
- Patta
  - Yarns come from different lot
  - Faulty cam use in the machine.
- Hole Mark
  - Holes are the result of the crack of yarn breakages.
  - Broken needles.
- Sinker Mark

- Faulty sinker use in the machine.

- Star Mark
  - Low GSM.
  - Bucking of the needle latch.
  - Yarn tension variation during production.

- Drop Stitches
  - Drop stitches are the result of a defective needle.
  - They also occur when a yarn is not properly fed during loop formation.

- Oil mark
  - Due to dirty machine and improper lubrication
  - Excess oil use

- Pin hole
- Grease mark

3.3.Grey Fabric Inspection Section

This is the section of dyeing in which the gray fabrics are checked by inspection machine. The fabrics faults are identified for grading the fabric for future steps qualified.

Machine specification of fabric inspection:

Brand Name: UZU Model: U2-90031 Country of origin: Thailand Serial no.: 0095172 Motor: 210HP Power:220V	Brand Name: HSING CHENG Model: HC-TIM-1500mm Country of origin: Thailand No of motor: 02 Motor: 210HP Power: 220v Year of Manufacture: 2005

3.4.Grey Fabric Store

This is a place of fabrics store where the fabrics are arranged by type of fabrics & buyer order after completing fabric grey fabric inspection.

Fabrics are separated by rolls or lot. Every face of lot or rolls contains -

- Fabric types
- Yarn count
- Fabric GSM
- Fabric faults name
- Lot number
- Roll number

This section has introduced card for every lots which contains the information about fabrics.

3.5.Batch Section

- Batching: Batching means separation of fabric according to specification, Dyeing machine capacity & availability, urgency of the order.

- Two types of Batching: 1. Solid 2. Assorted

- Batch contains body of garments as well as collar-cuffs according to the design.

$$\text{Batch Quantity} = \frac{\text{Total required quantity X Dia Quantity}}{\text{Total quantity}}$$

Batch distribution: - Batch is distributed according to nozzle capacity.

- During distribution maximum equilibrium of different parts is taken into consideration.
- Lycra fabrics are slit-cut to heat-set. That's why before dyeing they need to re-sewn. This is done by 'Bag-sewing' machine.
- Tubular fabrics are turned into their backside by turning machine.

List of machines in Batch Section:

Batch Section	Bag sewing m/cManufacture: MTG MECCANICA SNC Country Of Origin : Italy	03
	Turning m/c Brand Name: HSING CHENG Model: HC-TFM-1500 mm Country Of Origin : Thailand No of motor: 02 Motor: 210 HP Power: 220 V Year of Manufacture : 2005	02
	Plaiting m/c	02

3.6.Planning Section

Objectives:To follow-up total lead-time of any order & maintain schedule. After getting every order all planning required from yarn to dyeing is done by planning section.

Activities:

- Order for yarn.
- Give time limit to knitting.
- Machine & nozzle distribution after getting the fabrics fro knitting.
- Light shades are generally planned to dofirst.
- In case of critical color small batch is planned first.

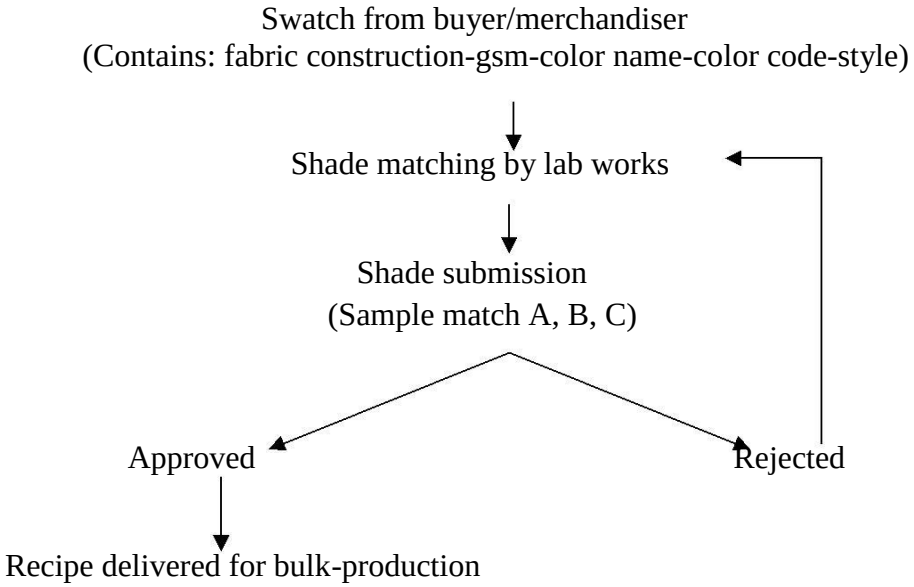
3.7.Central Laboratory

Knit concern has a '**Central Lab**' including three major sections – Knit-Dyeing lab, Yarn-Dyeing lab & Physical Lab.

3.7.1. Main Responsibility

- Accepting the 'Swatch' from the buyer and analyze the color & Dyes.
- Preparing the Recipe accurately matching the required color.
- Storing & maintain the dyes to be used for dyeing.
- Producing self-shades & storing it into the computer.
- Record & analysis of chemicals & dyes quality.
- Making plans for bulk dyeing.
- Following the color coding system given by the distinctive buyer & also prepare own color bank.
- Testing the dyed goods.

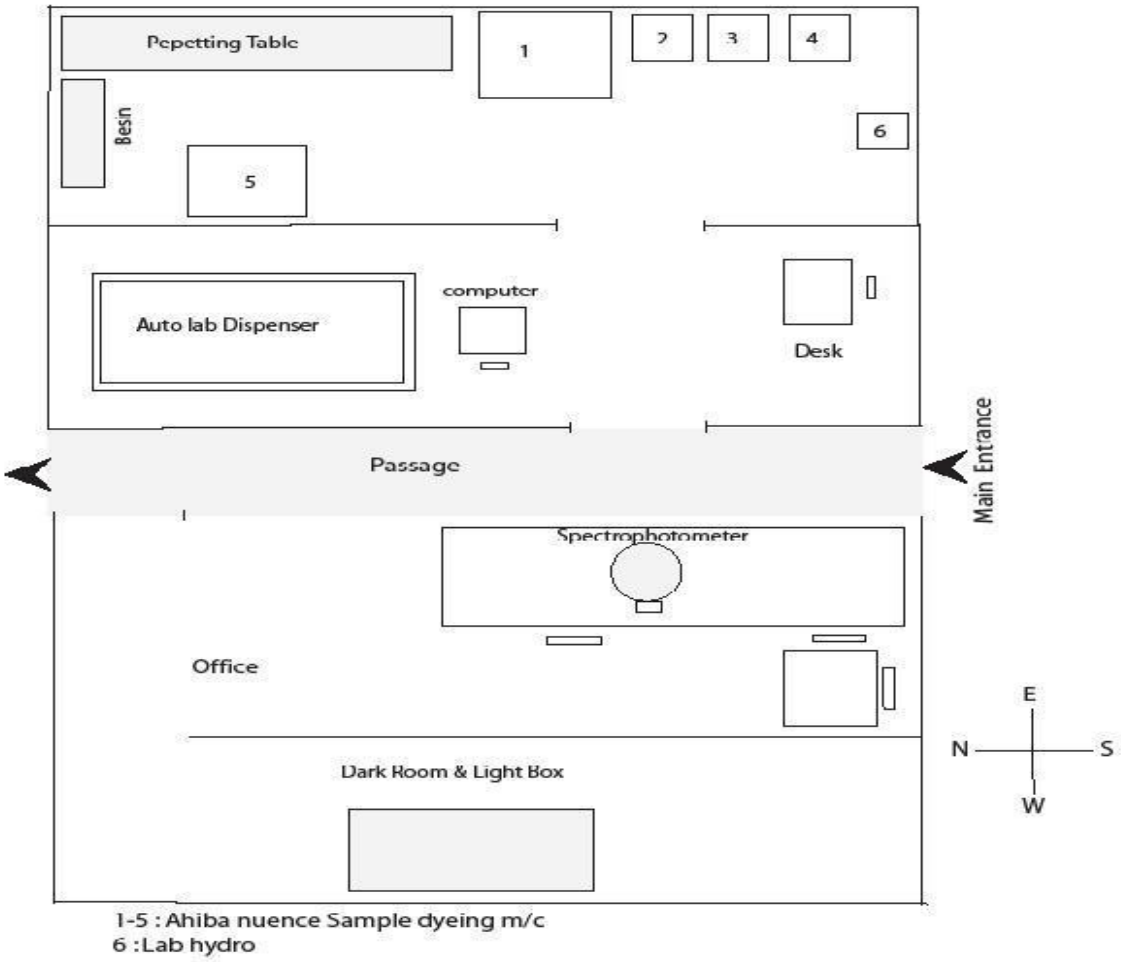
3.7.2. Flow of Work



3.7.3. Pantone Book

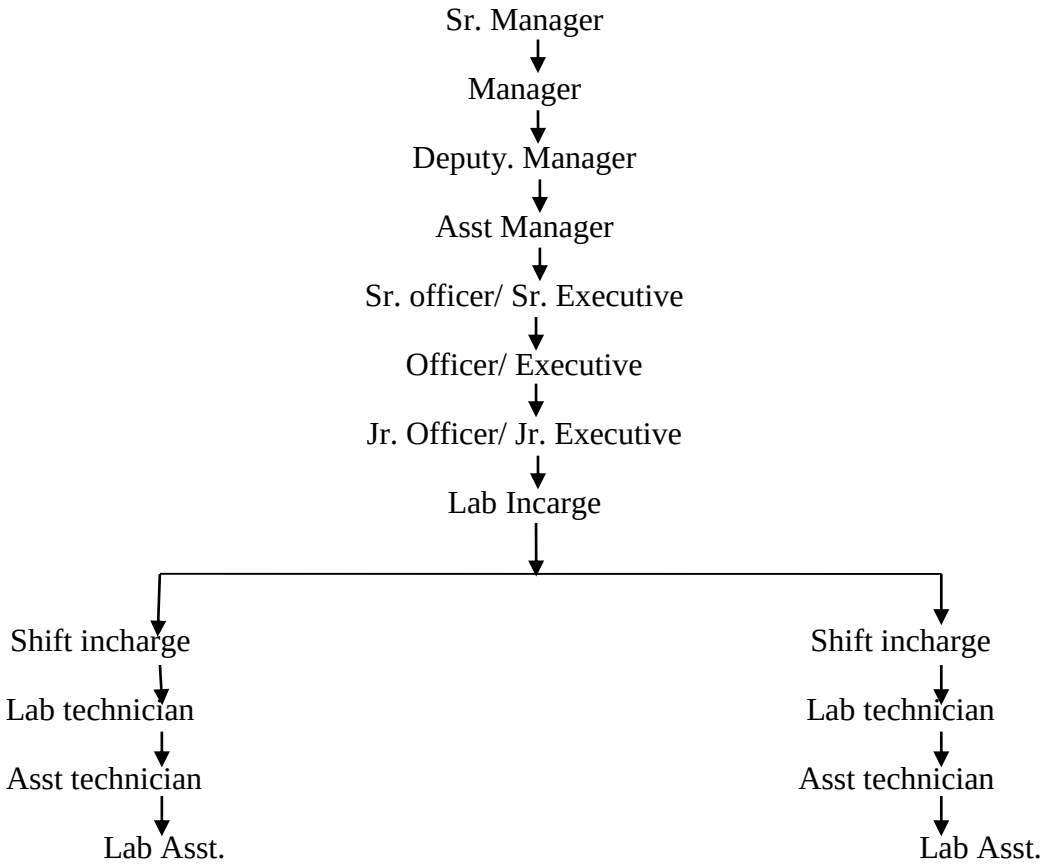
- Buyer's Swatch: may be pieceof fabric or C.I. number of any specified **'Pantone book'.**
- There are 4 types of pantone book is available:
    1. TP ----- textile paper
    2. TC ----- textile cotton
    3. TPX --- textile paper for bright
    4. TCX --- textile cotton for bright
- The given swatch is measured bythe 'Spectrophotometer', which is prepared by reach memory of different dyestuff self-shades.
- Also the matching may be done by previous working record.

3.7.4. Lay Out Of Knit-Dyeing Lab

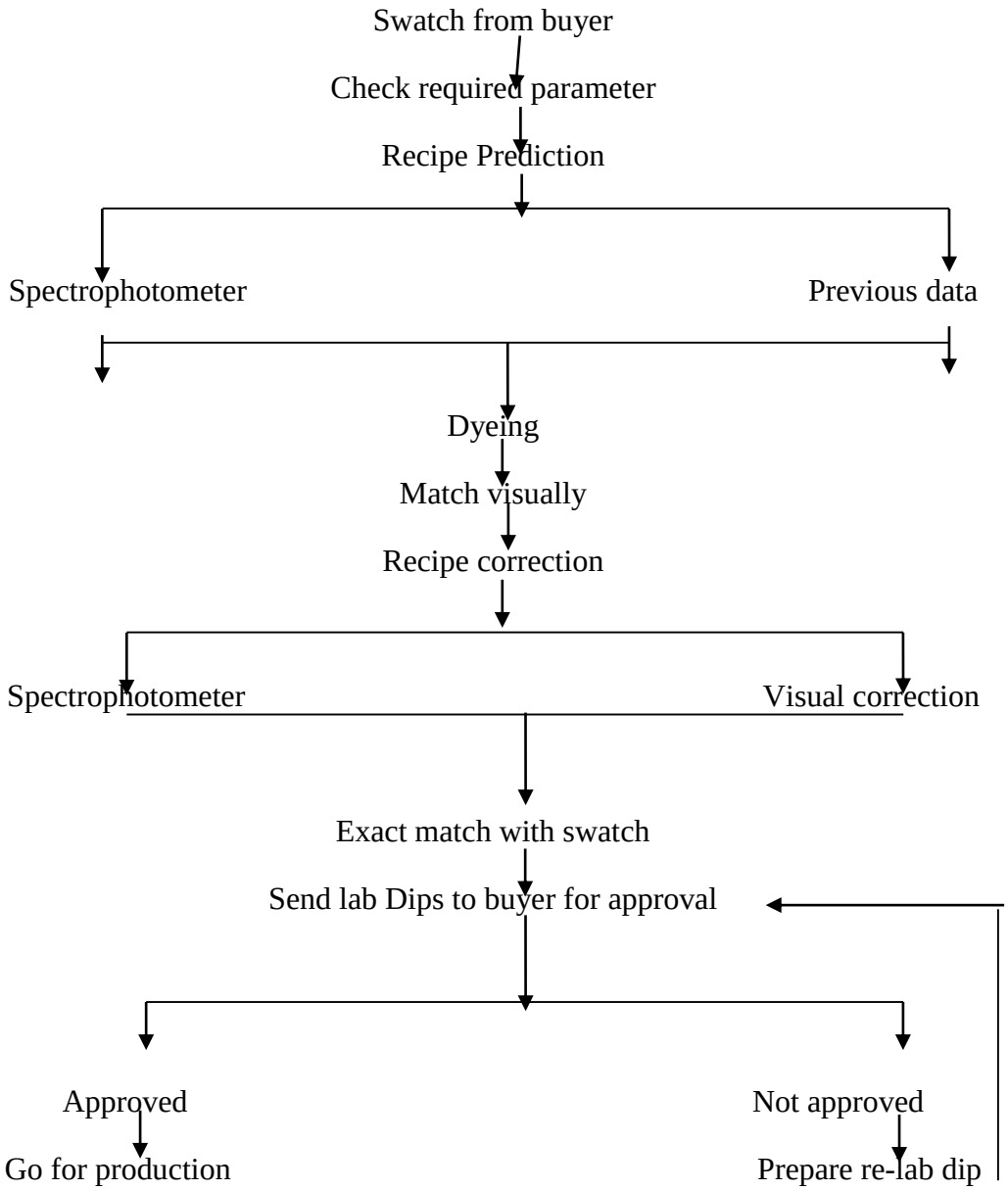


1-5 : Ahiba nuence Sample dyeing m/c
6 :Lab hydro

3.7.5. Organogram Of A Dye Lab



3.7.6. Process Flow Chart Of A Dyeing Lab



3.7.7. Machine Specification

Sample dyeing machine:

SANDOLAB (1,2,3):

Model Number : SUPERMATE

Manufacturer : CO-POWER

Origin :Taiwan

Function :Sample dyeing

Capacity :24 pot/Batch

Rotation Speed :60 rpm

Hydro extractor:

Model Number : SUPERMATE

Manufacturer : SDL Atlas

Origin : England

Function : To extract water from fabric

Air dryer machine:

Model Number : G209A

Manufacturer : SDL Atlas

Origin :England

Function :To dry fabric

Light Box:

Model Number : CAC 120-5

Manufacturer : VERIVDE

Serial Number : 110054702

Supplier : SDL ATLAS

Origin : England

Lights : TL 83, P15, D65, TL 8, F, UV

Auto Lab:

Model Number : TO-LAB V34

Manufacturer : LAWER

Origin : ITALY

Software version : V.3.9.0

Function : i. To Stock solution preparation

ii. Auto Dispensing of Given Recipe

Serial Number : 2709

Year : 2011

Capacity : 172 Bottles

Spectro Photometer:

Model Number : 650

Origin : USA

Software : i. Data color

ii. Data color Tools Plus

Function : Measuring color difference, reff%, Strength etc

3.7.8. Sample Dyeing Programmes (In Lab)

Programme 1 : ISO (60^{o}x60′)

Programme 2: HOT (80^{o}x60′)

Programme 3: WHITE (98^{o}x45′)

Programme 4 : 135^{o}x45′(100% PE)

Programme 5 : 130^{o}x45′(PE + Lyc)

Programme 6 :130^{o}x30′(PE + Lyc)

Programme 7 :R/C (80^{o}x20′)

Programme 8 : 100^{o}x30′(PA for light color)

Programme 9: 110^{o}x30′(PA for med/Black color)

Programme 10 : 80^{o}x20′ (PA-F1)

Programme 11:45°x20´ (PA-F2)

Programme 12: 110°x30´(PA-Flu)

Programme 13 : Migration

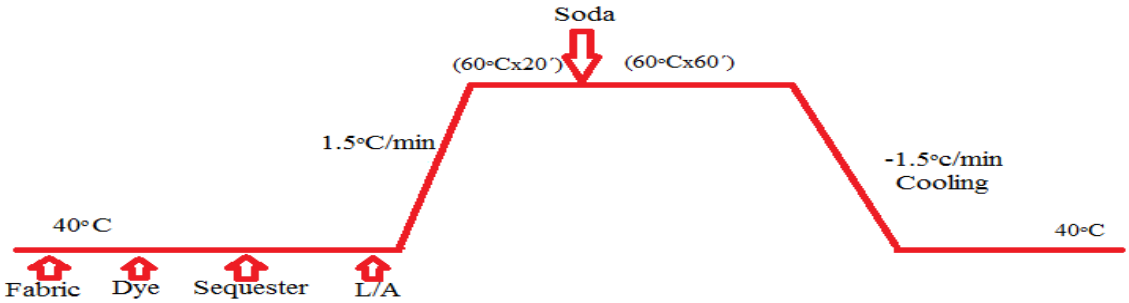
Programme 14 : Direct Dyeing (95°x40´)

Programme 15 : Bezakiv GO/GF

Programme 01

Process Name: ISO

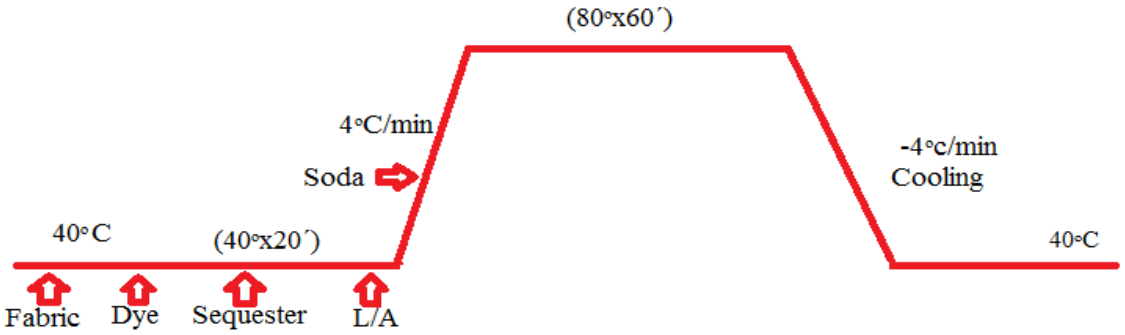
Applied on: Cotton



Programme 2

Process Name: HOT

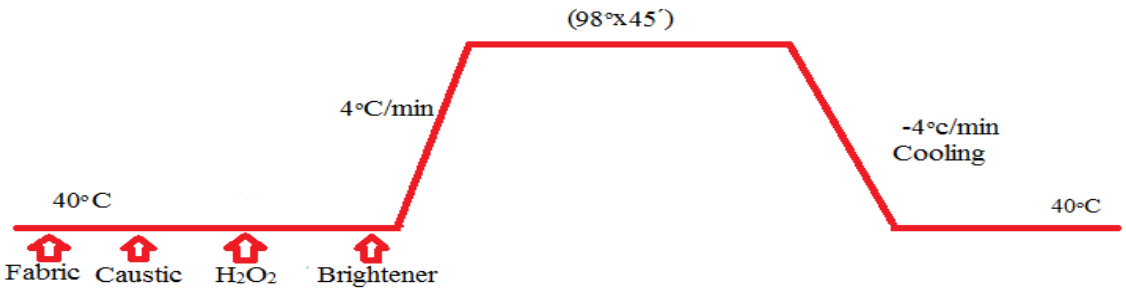
Applied on: Cotton



Programme 3

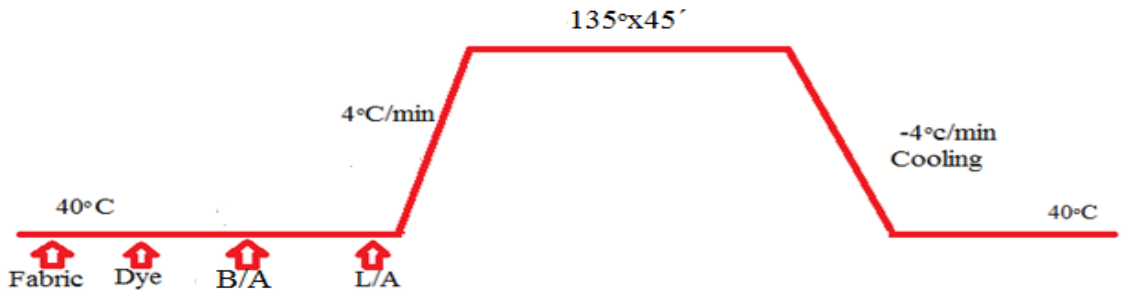
Process Name: White

Applied on: Cotton & cotton melange



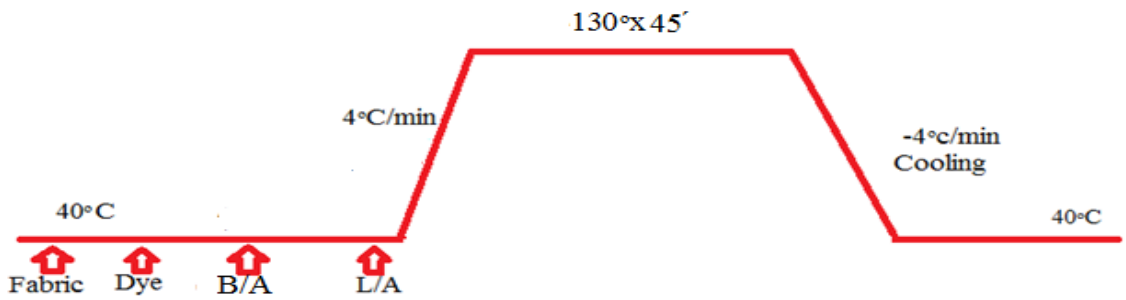
Programme 4

Applied on: Polyester (Disperse)



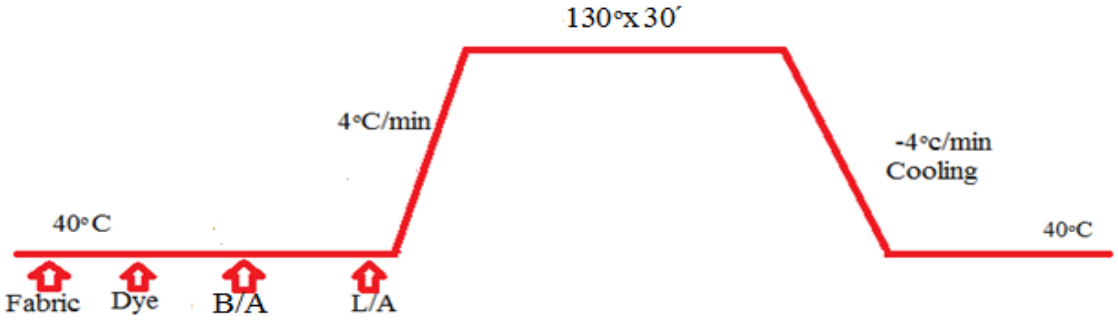
Programme 5

Applied on: Polyester Lycra (Disperse)



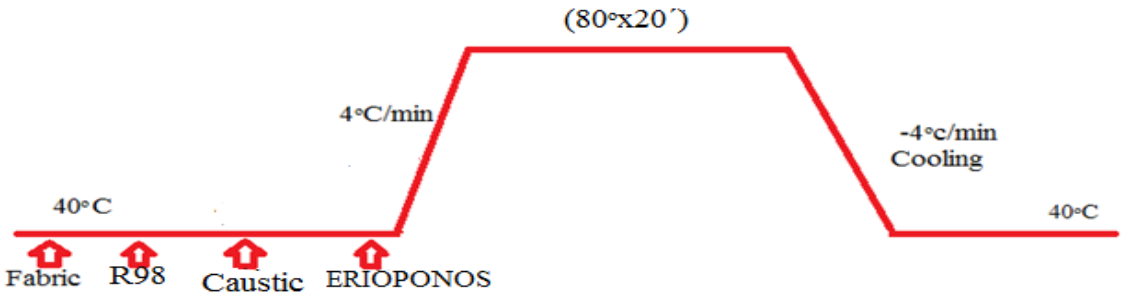
Programme 6

Applied on: Polyester Lycra (Disperse)



Programme 7

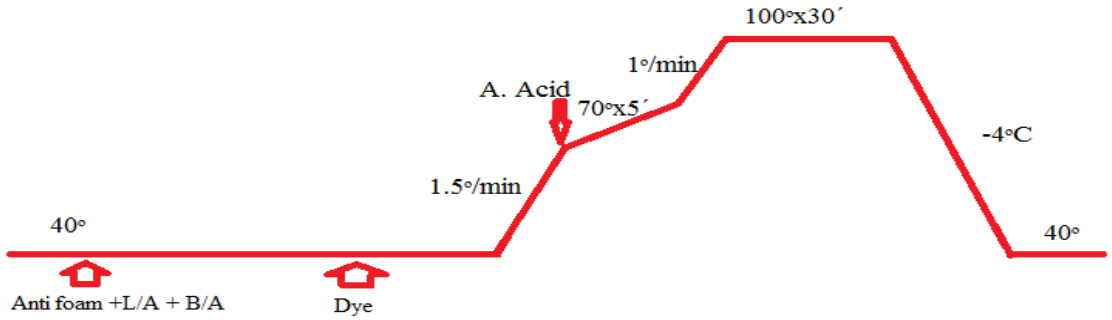
Applied on: Polyester & Polyester Lycra



Programme 8

Applied on: Polyester & Polyester Lycra

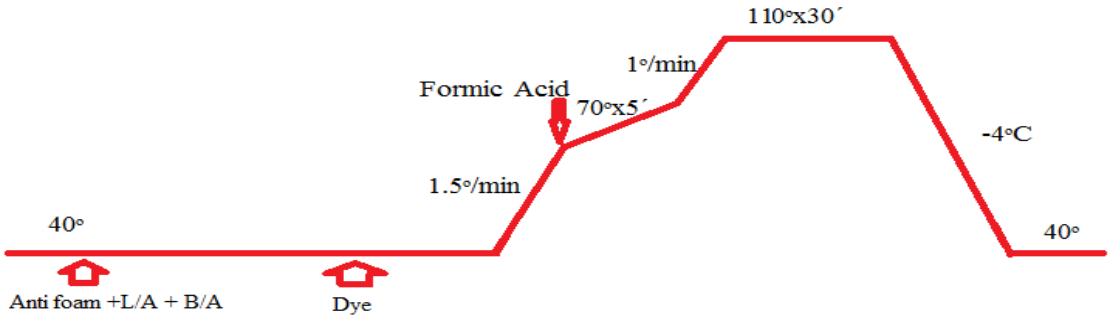
(for light color)



Programme 9

Applied on: Polyester & Polyester Lycra

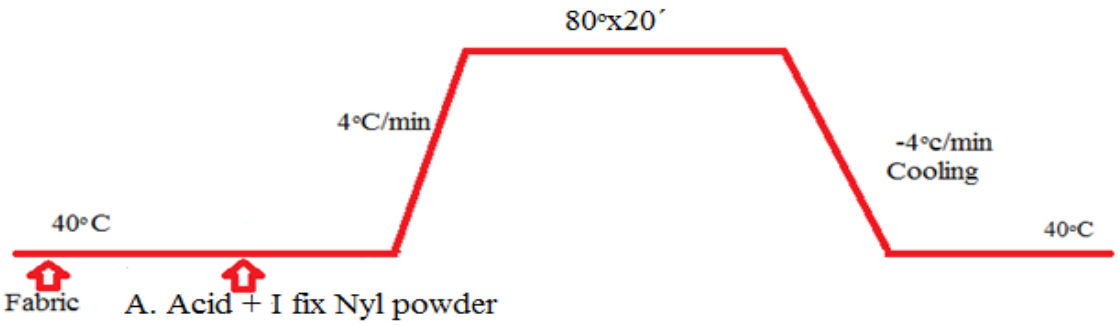
(for med/Dark color)



Programme 10

Process Name: PA Fixing -01

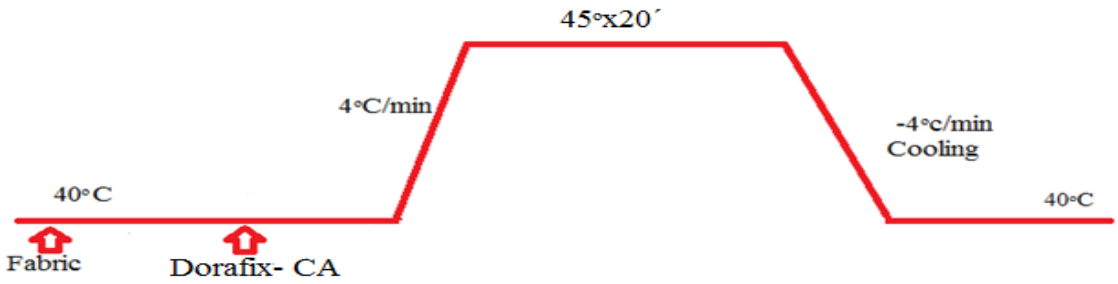
Applied on: PA / PA Lyc



Programme 11

Process Name: PA Fixing -01

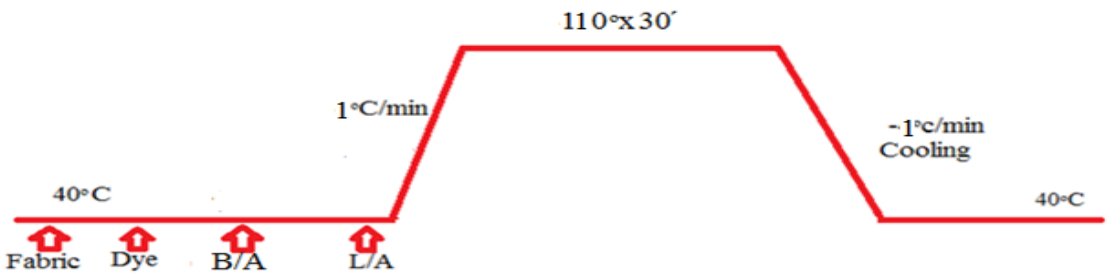
Applied on: PA / PA Lyc



Programme 12

Process Name: Luminous

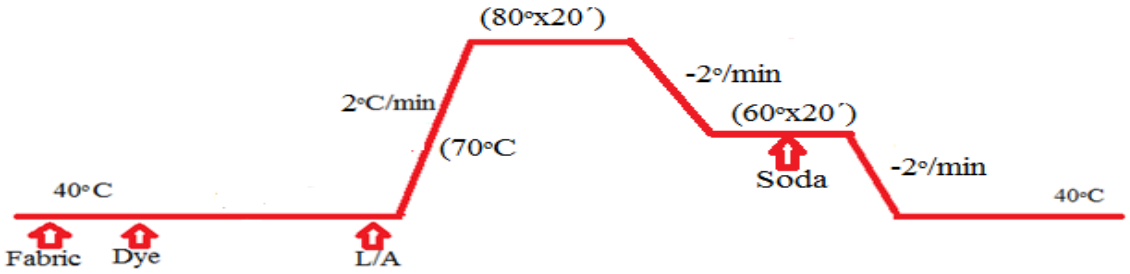
Applied on: PA / PA Lyc



Programme 13

Process Name: Migration

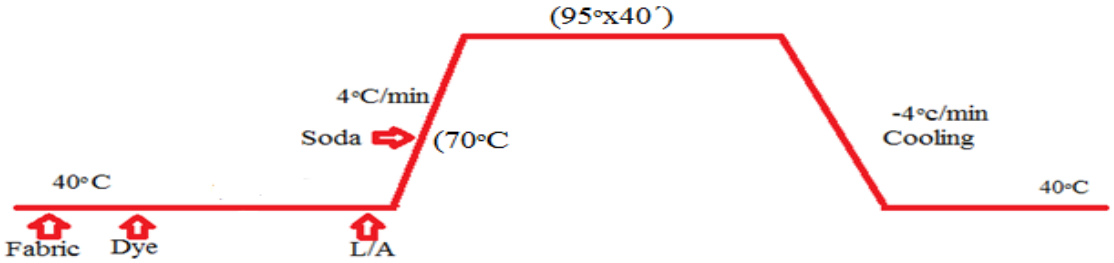
Applied on: Cotton



Programme 14

Process Name: Direct Dye

Applied on: Cotton

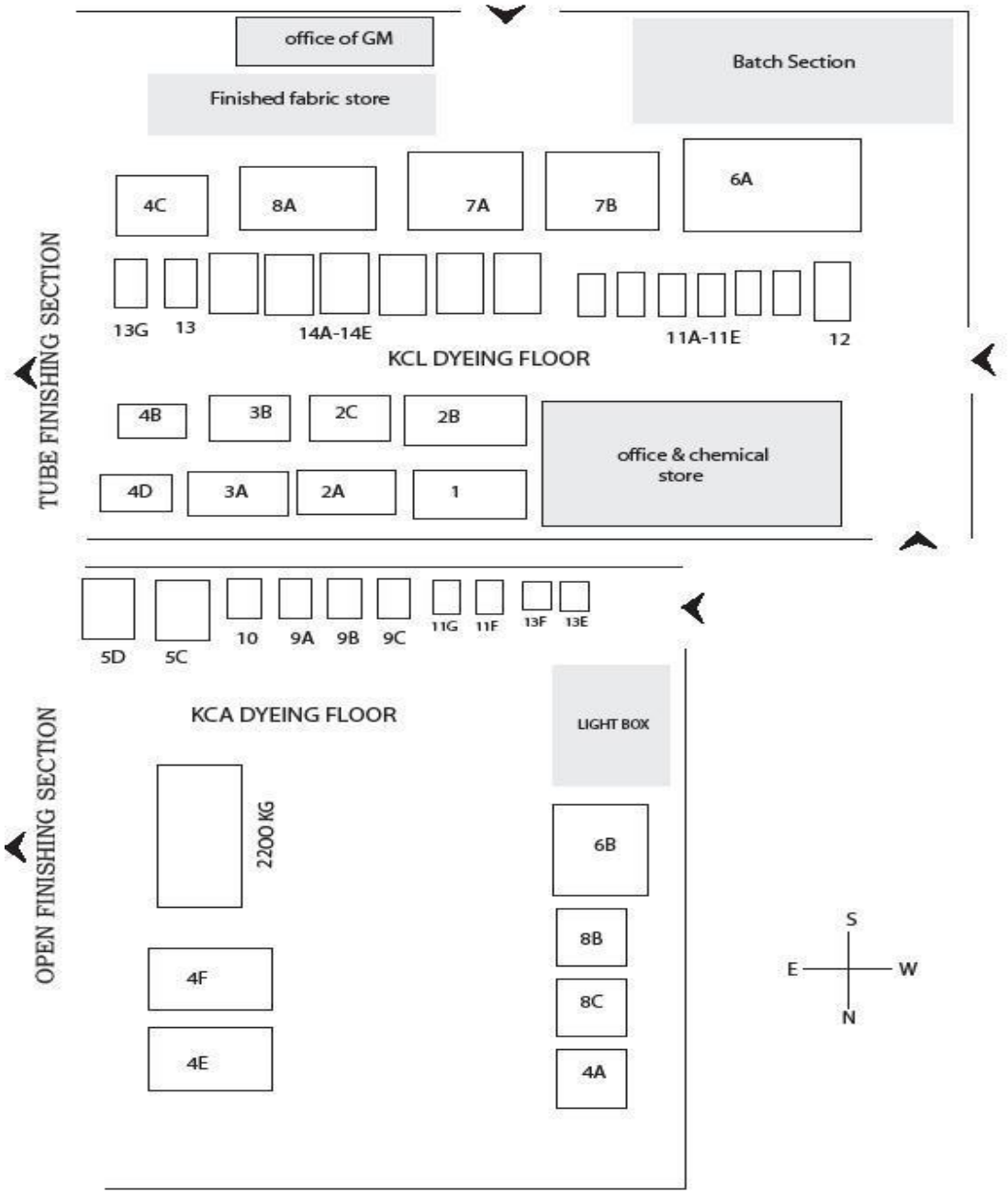


Programme 15

Bezakiv GO/GF

3.8.Dyeing Section

3.8.1. Layout Of Dyeing Floor



3.8.2. Dyeing Machine Specification

Knit concern Dyeing floor consists of two separate floors – KCL & KCA.
The Dyeing Machines are all **Winch dyeing m/c** of both atmospheric & high temperature types.

In KCL there are mainly three types of dyeing machine ---

1. Atmospheric machine: these runs in atmospheric pressure.
2. High temperature & High Pressure (HTHP)
3. Then Airflow Dyeing machine

Mac ine h No.	Brand name	Coun try	Year Built	Capacity (KG)	Temperat ure (°C)	No zle No. z
01	FONGS	Chin a	2002	1200	140	06
2A	FONGS	Chin a	2002	800	140	04
3A	FONGS	Chin a	2002	600	140	03
4D	FONGS	Chin a	2003	450	140	02
5B	FONGS	Chin a	1998	200	140	01
5A	FONGS	Chin a	1998	200	140	01
4E	FONGS	Chin a	2006	500	140	02
4F	FONGS	Chin a	2007	500	140	02
SPA	FONGS	Chin a	2006	300	98	01
4P	FONGS	Chin a	2006		98	02
4A	FONGS	Chin a	2006	300	98	02
8B	FONGS	Chin a	2006	750	98	03
8C	FONGS	Chin a	2006	750	98	03

6A	FONGS	Chin a	2003	1200	98	06
4B	FONGS	Chin a	1998	400	98	02
3B	FONGS	Chin a	2000	600	98	03
2C	FONGS	Chin a	2000	800	98	04
2B	FONGS	Chin a	2001	800	98	04
4C	FONGS	Chin a	2003	400	98	02
8A	FONGS	Chin a	1998	750	98	03
7B	FONGS	Chin a	2003	1000	98	04
7C	FONGS	Chin a	2003	1000	98	04
6A	FO NGS	Chin a	2003	1500	98	06

3.8.3. High Temperature- High Pressure Machine

Main Parts of Dyeing Machine:

1. Main Vessel or Chamber
2. Winch roller or Reel
3. Heat Exchanger
4. Nozzle
5. Reserve Tank
6. Chemical dossing tank
7. Utility lines i.e. water line, drain line, steam inlet etc.
8. Controlling unit or Processor
9. Fabric Plaiter
10. Different types of motors & Valves

Working Principle of Winch dyeing machine:

Winch Dyeing machines are most suitable for knit fabric dyeing. Here fabric is dyed in tubular from where fabric runs in endless circular path. Inside the m/c the upper part of the fabric runs through a nozzle & the lower part is immersed into liquor, in the nozzle the liquor is sprayed onto the fabric. The fabric and liquor both circulated by a high pressure pump.

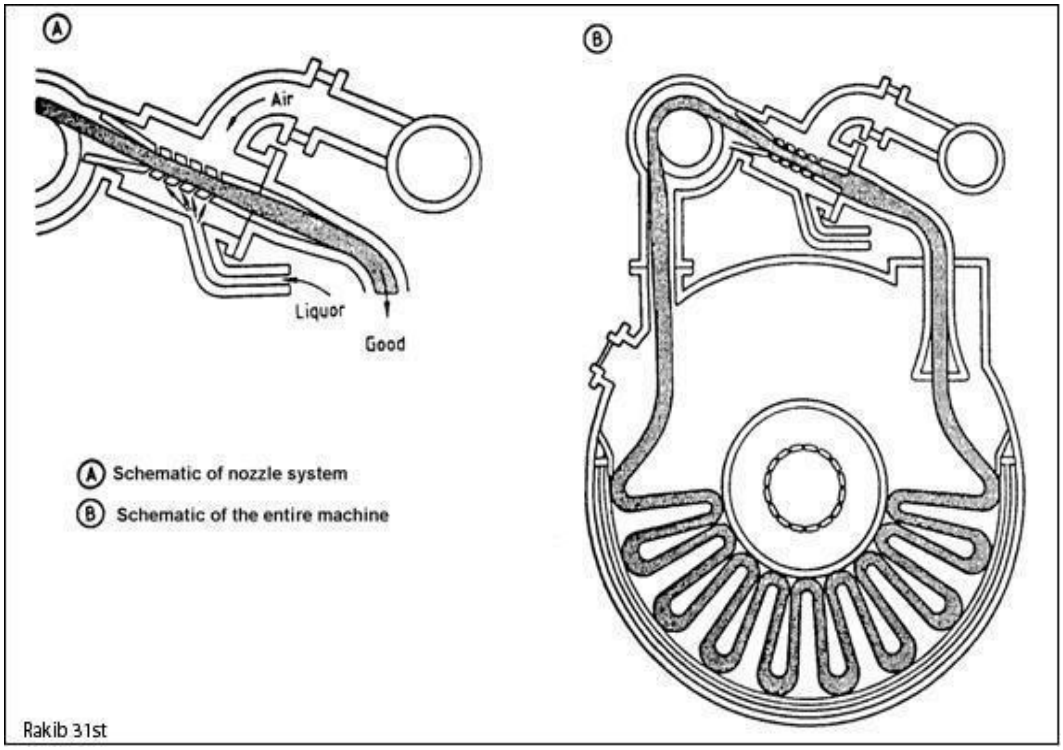


Fig: cross-sectional diagram showing fabric path & nozzle in the high pressure winch d/m

The main pump draws the liquor from the bottom of the vessel & passed this liquor through the heat exchanger to the top of vessel into the Nozzle. The winch roller or the reel also helps running the fabric smoothly. The liquor gets heated or cooled by exchanging temperature in the heat-exchanger.

3.8.4. Airflow Dyeing M/C

This is another development of the very popular jet dyeing machines. The main difference between the Air Flow Machine and Jet Dyeing machine is that the airflow machine utilizes an air jet instead of the water jet for keeping the fabric in circulation. Typically the fabric is allowed to pass into the storage area that has a very small amount of free liquor. This results in a reduction in consumption of water, energy and chemicals. The figure below shows how in an Airflow Machine the bath level is always under the level of the processed textile. Here the fabric does not remain in touch with the liquor (the bath used is below the basket that holds the fabric in circulation). This invariably means that the bath conditions can be altered without having any impact on the process phase of the substrate.

Standard Equipment For Dyeing Machine:

1. Main tank made of supreme stainless steel SUS. (SS 316L)
2. The bottom of main tank is covered with fine Teflon Pipes.
3. Special stainless steel fan with inverter control.
4. Cloth lift and laying up synchronous adjustment with inverter control.
5. Air dust filter of fabric cuttings and fluffs.
6. Filter of fabric cuttings and fluffs before pump.
7. Full automatic program, computer control .
8. Proportional temperature control.
9. Feed pump of dosing tank.
10. Liquor atomizing and jetting device.
11. Proportional dozing device.
12. High efficient steam heat exchanger.
13. Analog water level control system.
14. High temperature discharge system.
15. Delivery device.
16. Double-inlet drain-select system.
17. Cloth end detection device.

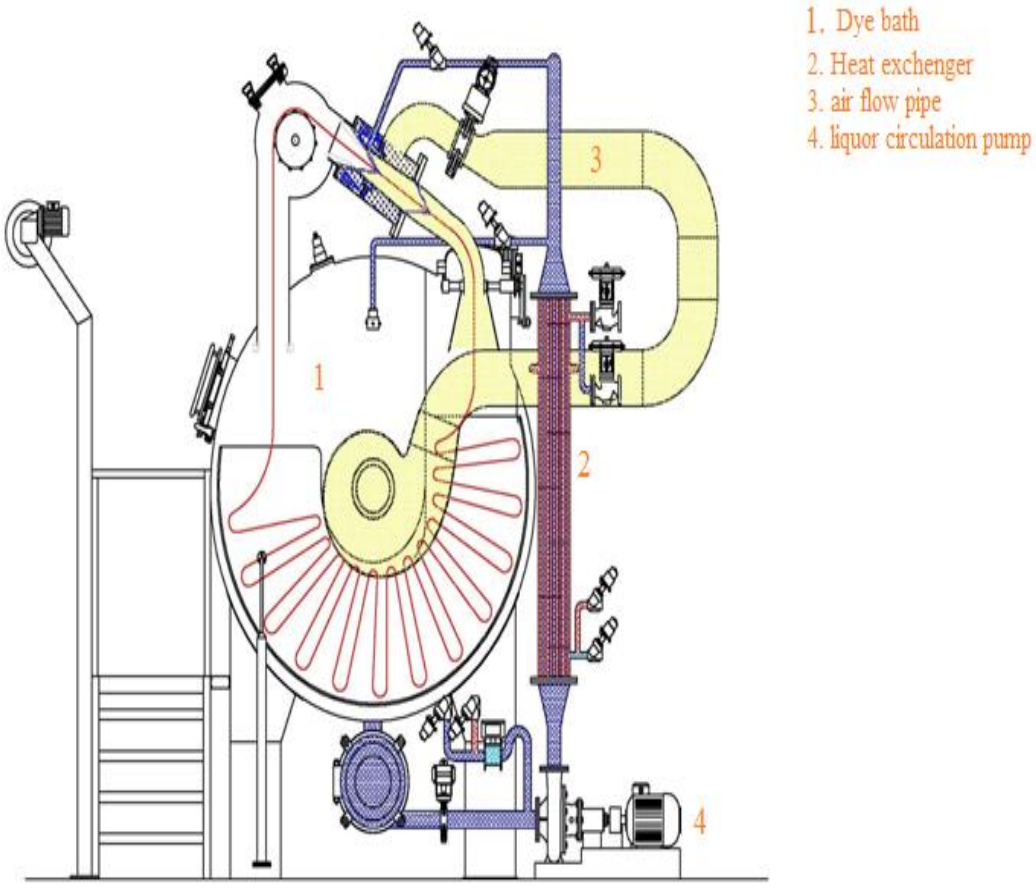
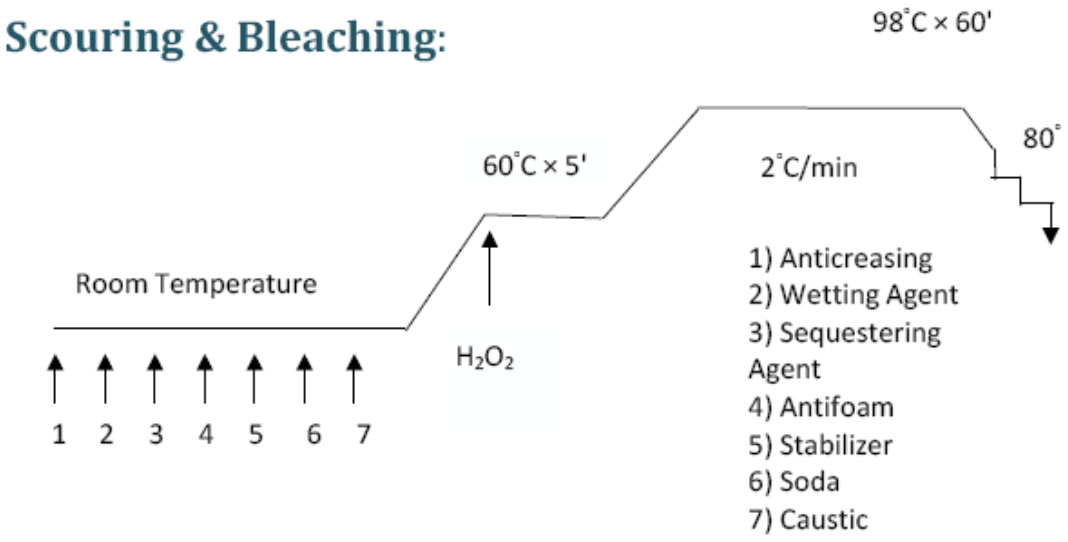
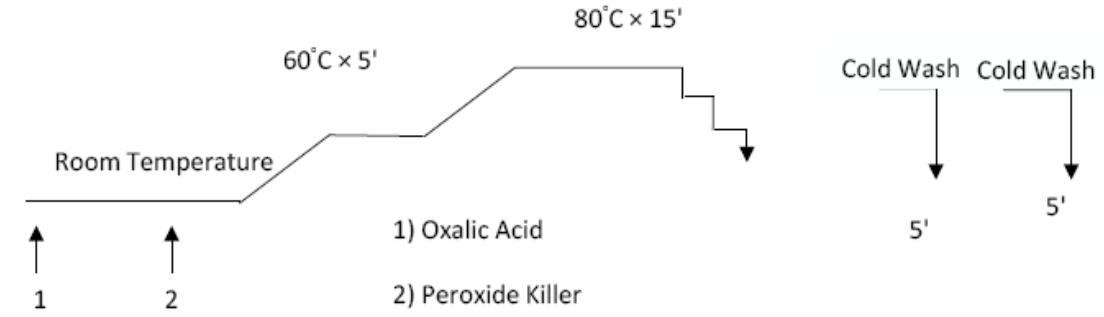


Fig: cross-sectional diagram showing fabric path & nozzle in the air flow dyeing m/c

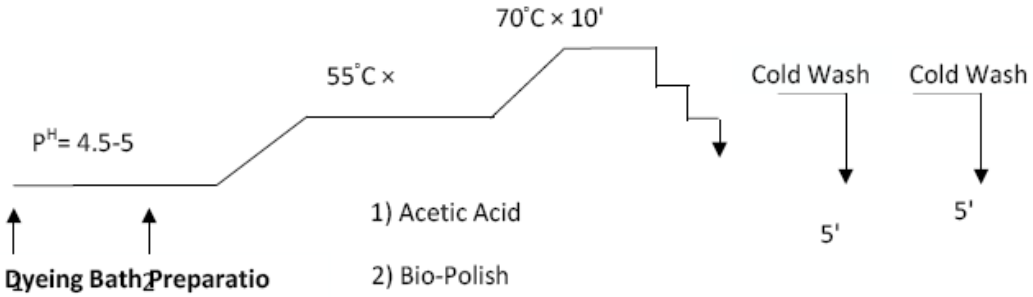
3.8.5. General Pretreatment Program



Chemical Wash:

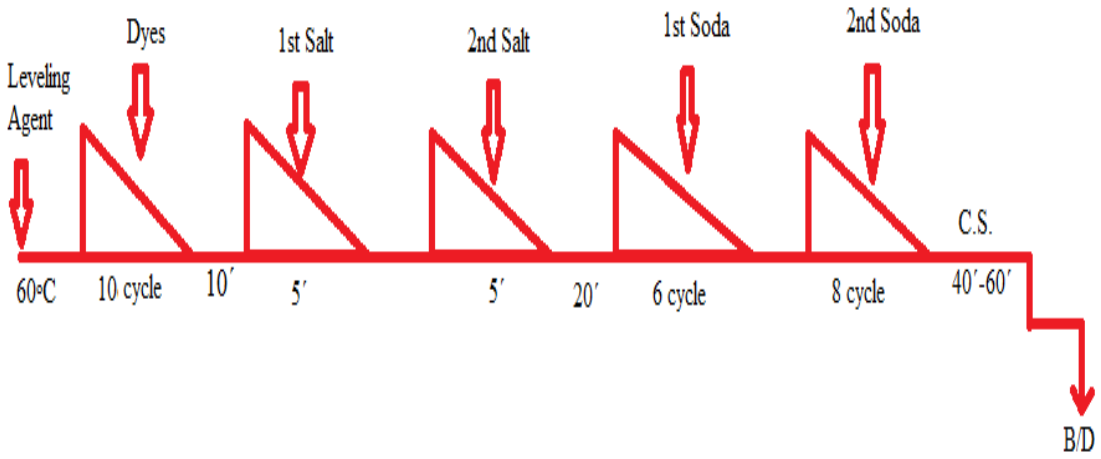


Bio Polishing/Enzyme Wash:

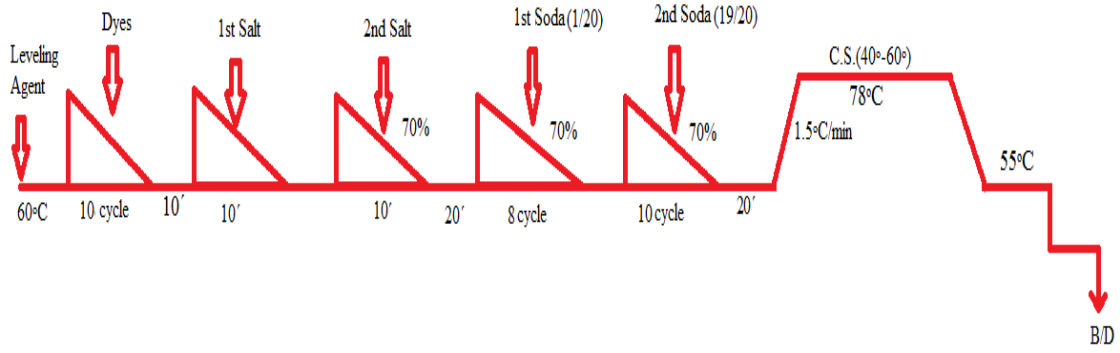


3.8.6. Dyeing Program

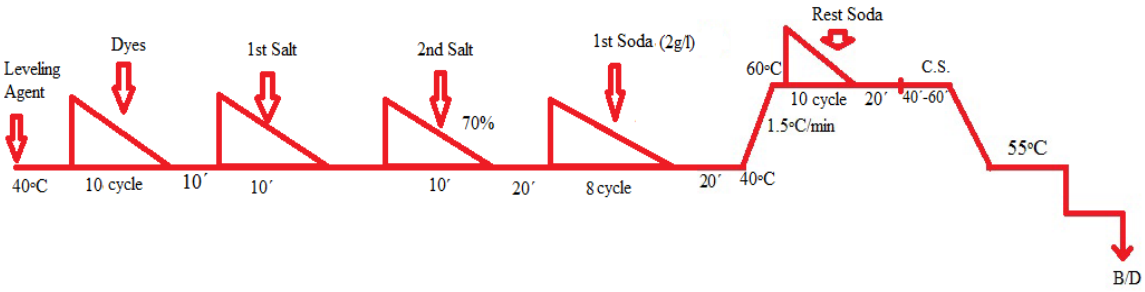
ISO Process



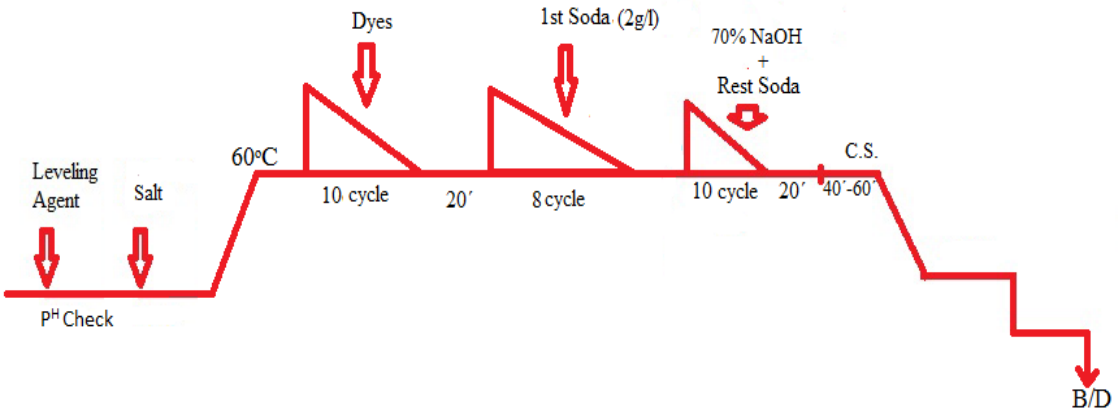
G-ISO Process



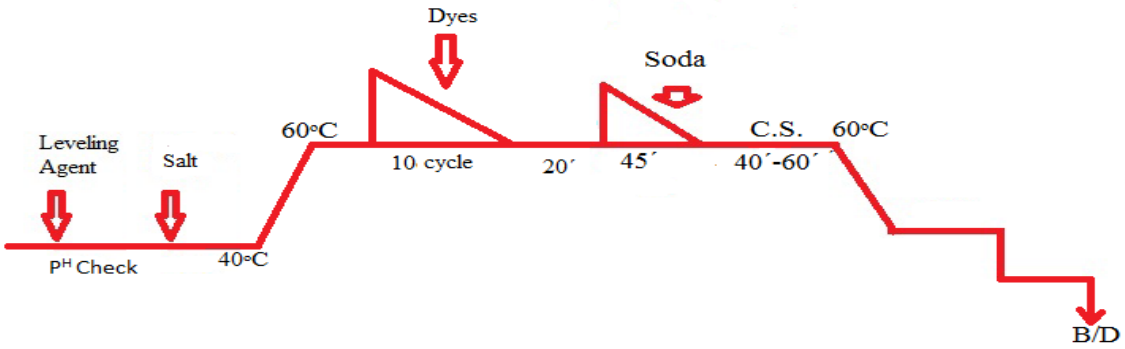
RSPL Process



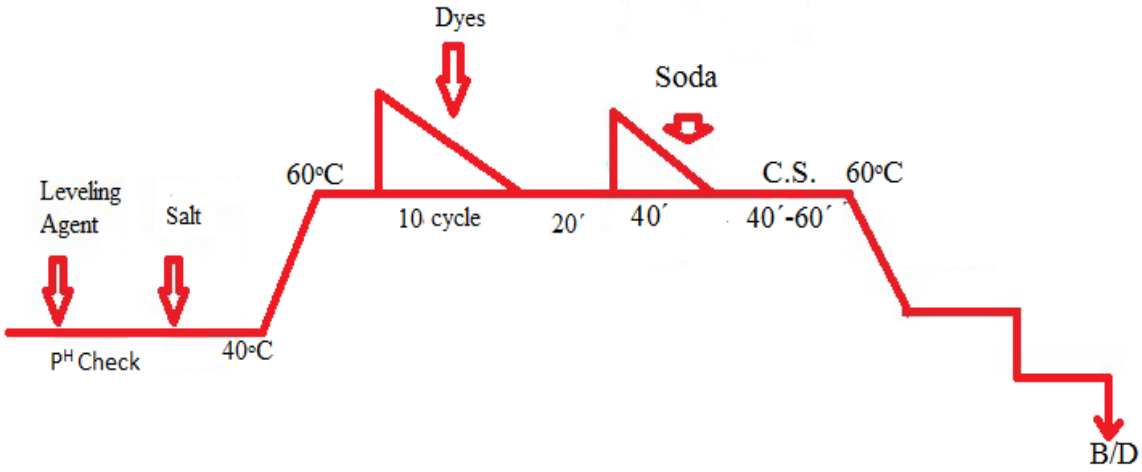
Amron / Starfix process



R.G.B. Process



R.R. Series (Remazol)



3.8.7. Production Sequences & Operations

Lab dip approved

▼

Grey fabricinspection

▼

Batching

▼

Scouring & Bleaching

▼

Enzyming (Ifrequired)

▼

Dyeing

▼

Bath Drain

▼

Cold Wash

▼

Neutral With Acetic Acid

▼

Soaping

▼

Fixing (If required)

▼

Softening

Dyeing Process For Lab

Cotton Dyeing

Leveling

▼

Dyestuff

▼

Glauber Salt

▼

Acetic Acid

▼

Sample

▼

30 min runtime with temp graduating to 60°c

▼

At 40°c Soda Addition

▼

60 min runtime at 60°c

▼

Cooling

▼

Washing hot & Cold

▼

Neutralizing by acid wash

▼

Soap wash

▼

Drying

Polyester Dyeing in Lab

Sample

▼

Neutralizing (by acetic at 50°c)

▼

Cooling

▼

Dispersing agent + Buffer + acetic + Dyestuff

▼

45 min Run at 135□c

▼

Reduction cleaning (Hydrose + Eriopon OS + Caustic)
At 80°c for 45 min

▼

Wash

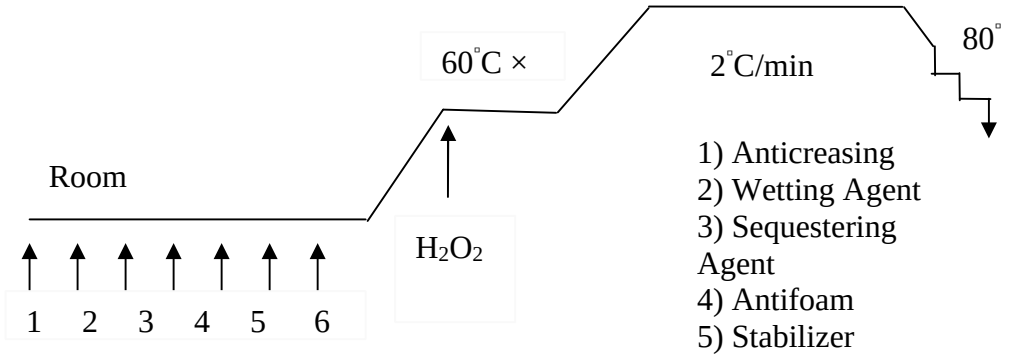
▼

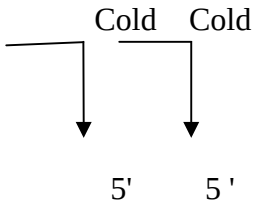
Chemical Wash

Process	Temp(▫C)	pH	Time min	M : L ratio
Scouring Bleaching	98	11.5-12	60'	1:6 or 1:8
Enzyme Wash	55	4.5-5	60'	1:8
Enzyme Deactivation	70	--	10'	--
Reactive Dyeing (Light Shade)	60	10.2-10.8	60'	1:8
Reactive Dyeing (Dark Shade)	60	10.9-12	60'	1:8
White Shade	98	10.5-11.5	20'	1:8
Turquish color dyeing	80-90	10.9-12	90'	1:8
Polyester dyeing	130	4-4.5	45'	1:8

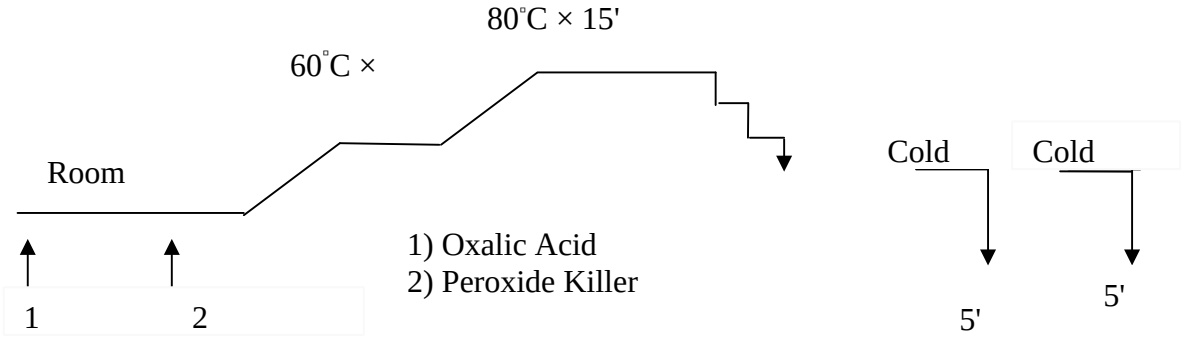
3.8.8. General Process For Pre-Treatment

Scouring & Bleaching: 98°C × 60'

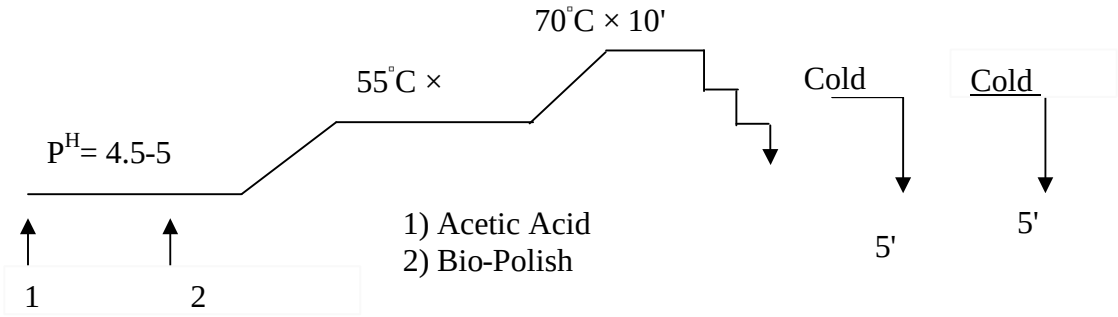




Chemical Wash:



Bio Polishing/Enzyme Wash:



3.8.9. General Process For Dyeing

- Auxiliaries are added at 50° C
-Salt added by dosing system (time : 10-20 ')

- pH maintained at 6.5-7
-Color dosing at 6O° C for 20'

Exhaustion & Fixation:
-After 30' soda ash added by dosing for 30-35'

-pH checked & maintained at 10.5

-Dye bath is kept at 60° C for 40-60'

-After every 10' the sample is checked fixation occurs during this time. -Rinse for 10' & the bath is drained.

Neutralization:
-The material should be neutralized to remove alkaline condition at room temperature by acid wash for 15 min & rinsing will be carried on for 10 min.

Soaping:
-Then soaping agent is added & temperture raised to 90°-100°C for 10 min.

-The bath is cooled 7 rinsed for 10 min.

-Dye bath temperature then cooled to 60° C.

Softening:
Softener is applied to soften the fabric as well as it improves the hand feel. The material is treated at 60°C for 20 mins. Then rinsing again & material unload.

Procedure:

At first the bath is set at 50° C & take the right volume of water in the dye bath.

▼

Required amount of wetting agent is added.

▼

Caustic soda is added & second heat command 60°C & stabilizer is added also.

▼

H_20_2 is dosed & 10' runs.

▼

Temperture raised to 100° C & run the material for 30'

▼

Cooling the bath at 75°C & bath is drained .
At 90° C the material is run for 15 mins

▼

Cooling the bath to 75°C to darin

▼

Add Acetic Acid to neutralize the whole bath of fabric & run time is 20'

▼

Rinse the fabric for 5' & bath is drained .

▼

New water from reserver is taken & pH should be 4.5-5 .

▼

Enzyme is injected to the bath . Run time is 60' at 55°C

▼

Temp. raised to 70° C & run time 10' & then drain

▼

Again new water is taken & dosing of glaubar salt for 20' & pH should be check (pH =7)

▼

Color dosing for 30' at 50°C

▼

Soda is added by dosing for 40'at 50°C

▼

Then raise the temp. & run the fabric for 35-60 '.At this time after every 10' the sample is checked.

▼

Rinse the material for 10' & bath is drained.

▼

At room temp. acid treatment is done for 20'& rinse the material for 5'

▼

Soaping is done at 90°C for 10 min & bath is drained.

▼

Fixing agent is added at 50° C & run time is 20' & bath is drained

▼

Softening is done at 60° C for 20'& bath is drained.

▼

Finally the fabric is unloaded.

Process for White Shade:

At first Scouring bleaching chemicals are added to the bath & they are treated at 98°C for 60'

▼

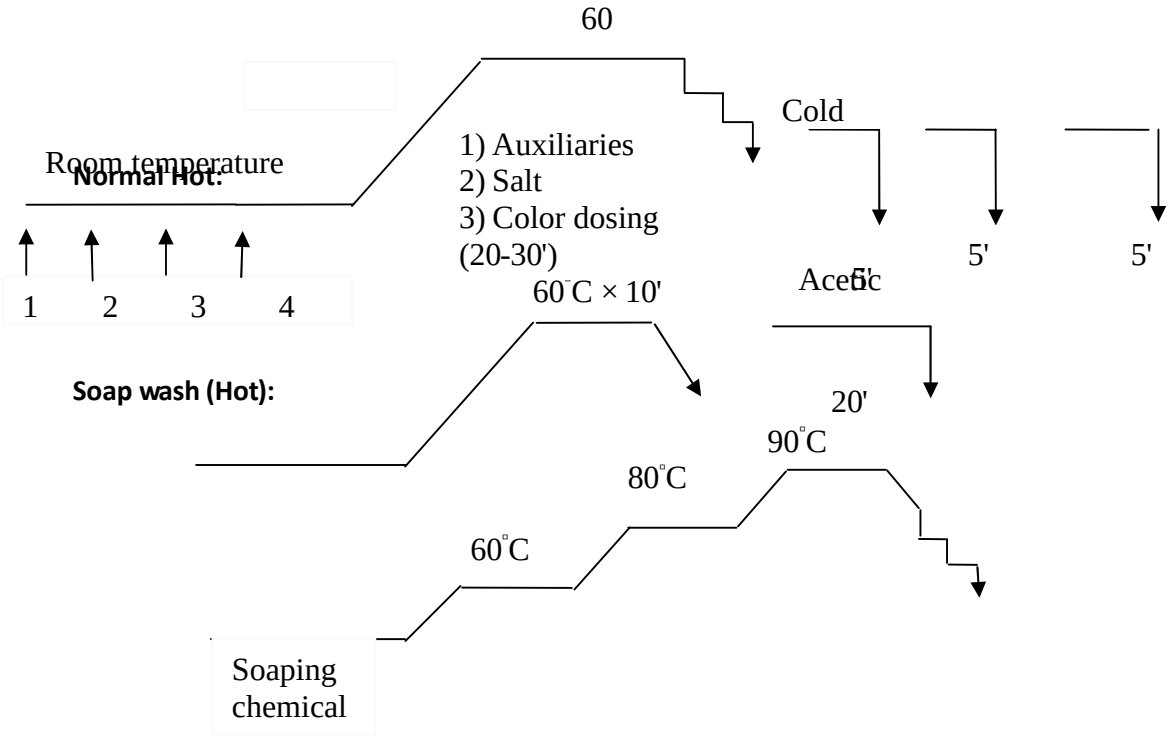
Temp. lowered at 80°C & OBA is added.Run time is 10'.

▼

Temp. raised to 98° C & Run time is 20'.

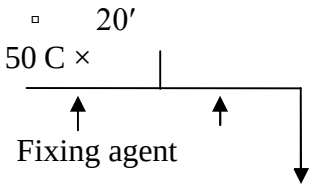
▼

Then enzyme treatment is applied & then softening occurs

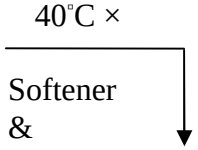


Dyeing Curve: ▫C × 60'

Fixing (if dark shade):



Softening:



3.8.10. Some Dyeing Recipe Used In Bulk Dyeing Process

Knit Dyeing Recipe#1
Color : 10-100-White
M: L : 1:8
Material Type : 100 % Cotton
Sample:

Auxiliaries/Chemicals	Amount (g/l)	Amount (%)
SCOURING & BLE ACHING		
Kappasol AF -2000 (Antifoam)	0.15	-
Polymer ECO (Anticreasing)	0.50	-
Tino Wine (Multi-Functional)	3.00	-
Caustic	2.00	-
H_2O_2 (50%)	8.00	-
PHYSICAL BLEACHI NG		
Bluton BVB (OBA)	-	0.23
NEUTRALIZATION		
Oxalic Acid	1.00	-
Denquest HYN (Sequestering)	0.20	-
ENZYMATIC CLEANI NG		
Acetic Acid	0.80	-
Unizyme 1000L (Enzyme)	0.60	-
FINISHING		
Softener E-31	-	10
Denquest HYN (Sequestering)	0.20	-

Knit Dyeing Recipe #2
Color :(Pink)
M: L : 1:7
Material Type : 100 % Cotton

Auxiliaries/Chemicals	Amount (g/l)	Amount (%)
SCOURING & BLEACHING		
Kappasol AF -2000 (Antifoam)	0.10	-
Kappawet BOSS (Detergent)	0.60	-
Polymer ECO (Anticreasing)	0.70	-
Denquest HYN (Sequestering)	0.40	-

Fistol AWP (Stabilizer)	0.40	-
Caustic	1.50	-
Soda	0.80	-
H_2O_2 (50%)	2.50	-
NEUTRALI ZATION		
Oxalic Acid	0.50	-
ENZYMATIC CLEANING & PEROXIDE RE MOVAL		
Antiper R (Peroxide Killer)	0.50	-
Acetic Acid	0.80	-
Polymer ECO (Anticreasing)	0.30	-
Unizyme 1000L (Enzyme)	0.60	-
DYEING BATH		
Kappasol AF -2000 (Antifoam)	0.10	-
Polymer ECO (Anticreasing)	0.50	-
Albatex – DBC (Levelling)	1.00	-
Bezactive Yellow – SMAX	-	0.182
Bezactive Red – S3B – 300%	-	0.28
Glauber Salt	30	-
Soda	10	-
NEUTRALI ZATION		
Acetic Acid	0.50	-
SOAPI NG		
Kappaquest A41 (Soaping)	0.50	-
AFTER TRE ATMENT		
Softener SA -1000	-	10
Invatex –AC (Core Neutralizer)	0.40	-

Knit Dyeing Recipe #3

Color :Gris Moyen

M: L :1:8

Material Type :100 % Cotton

Auxiliaries/Chemicals	Amount (g/l)	Amount (%)
SCOURING & BLEACH ING		
Kappasol AF -2000 (Antifoam)	0.10	-
Kappawet BOSS (Detergent)	0.50	-
Polymer ECO (Anticreasing)	0.70	-
Denquest HYN (Sequestering)	0.40	-
Fistol AWP (Stabilizer)	0.40	-
Caustic	1.50	-
Soda	0.80	-
H_2O_2 (50%)	2.50	-
NEUTRALIZATION		
Oxalic Acid	0.50	-
ENZYMATIC CLEANING & PERO XIDE REMOV AL		
Antiper R (Peroxide Killer)	0.50	-
Acetic Acid	0.80	-
Unizyme 1000L (Enzyme)	0.30	-
DYEING BATH		
Kappasol AF -2000 (Antifoam)	0.10	-
Biavin – 109 (Anticreasing)	0.50	-
Albatex – DBC (Levelling)	0.50	-
Remazol Ultra Yellow RGB	-	0.8060
Remazol Ultra Red RGB	-	0.6160
Remazol Navy RGB	-	1.060
Glauber Salt	50	-
Soda	15	-
NEUTRALIZATION		
Acetic Acid	0.50	-
SOAPING		

Kappaquest A41 (Soaping)	1.00	-
AFTER TREATMENT		
Softener SA -1000	-	1
Invatex –AC (Core Neutralizer)	0.20	-

Knit Dyeing Recipe #4

Color : 902-Noir (43517) Black
M: L :1:8
Material Type :100 % Cotton

Auxiliaries/Chemicals	Amount(g/l)	Amount(%)
SCOURING & BLEACH ING		
Kappasol AF -2000 (Antifoam)	0.10	-
Kappawet BOSS (Detergent)	0.50	-
Polymer ECO (Anticreasing)	0.30	-
Denquest HYN (Sequestering)	0.30	-
Caustic	0.30	-
H_2O_2 (50%)	2.00	-
	2.00	-
NEUTRALIZATION		
Acetic Acid	0.30	-
ENZYMATIC CLEANING		
Acetic Acid	0.80	-
Unizyme 1000L (Enzyme)	0.80	-
DYEING BATH		
Kappasol AF -2000 (Antifoam)	0.10	-
Polymer ECO (Anticreasing)	0.20	-
Albatex – DBC (Levelling)	1.00	-
Reactive Yellow 3R	-	1.10
Sunfix Red MF – 3BD	-	0.550
Reactive Starfix Black - GR	-	7.0
Glauber Salt	80	-
Soda	20	-
Caustic	2	-
NEUTRALIZATION		

Acetic Acid	1.00	-
SOAPING		
Kappaquest A41 (Soaping)	1.00	-
Kappaquest A41 (Soaping)	0.50	-
AFTER TREATMENT		
Softener SA -1000	-	10
Invatex –AC (Core Neutralizer)	0.40	-

Knit Dyeing Recipe #5
Color : Royal blue
M: L :1:8
Material Type : 100 % Cotton

Auxiliaries/Chemicals	Amount (g/l)	Amount (%)
SCOURING & BLEACH ING		
Kappasol AF -2000 (Antifoam)	0.15	-
Kappawet BOSS (Detergent)	0.70	-
Polymer ECO (Anticreasing)	0.30	-
Denquest HYN (Sequestering)	0.50	-
Fistol AWP (Stabilizer)	0.40	-
Caustic	2.00	-
Soda	1.00	-
H_2O_2 (50%)	3.00	-
NEUTRALIZATION		
Oxalic Acid	0.50	-
ENZYMATIC CLEANING & PERO XIDE REMOVA L		
Antiper R (Peroxide Killer)	0.50	-
Acetic Acid	0.30	-
Unizyme 1000L (Enzyme)	0.60	-
DYEING BATH		
Kappasol AF -2000 (Antifoam)	0.40	-
Polymer ECO (Anticreasing)	0.30	-
Denquest HYN (Sequestering)	0.40	-
Albatex – DBC (Levelling)	1.20	-
Dychufix Yellow -3R-XF 150%	-	0.02

Dychufix Red – EC	-	0.05
Remazol Brilliant Blue RSPL	-	1.60
Glauber Salt	40	-
Soda	15	-
NEUTRALIZATION		
Acetic Acid	0.80	-
SOAPING		
Fistol RS (Soaping)	0.50	-
AFTER TREATMEN T		
Softener SA -1000	-	10
Invatex –AC (Core Neutralizer)	0.40	-

Machine Wash

Recipe:

-First of all these two chemicals are taken & treated in normal temperature for 30 min.

Soda ash = 0.5 g/L Bleaching powder = 0.5 g/L

Then Direct drain is done.

for white - - -

First of all these two chemicals are taken & treated in normal temperature for 30 min.

Soda ash = 0.5 g/L Bleaching powder = 0.5 g/L

Then Direct drain is done.

-After that these two chemicals are taken & treated with fabric at 98°C for 60 min.

Hydrose = 1-2 g/L

Caustic Soda = 1-2 g/L

Add hydrose (6 g/L) & caustic Soda (6 g/L)
▼
Run 20' at 110° C
▼
Run 10' at 95° C
▼
Run 10' at 80° C
▼
Run 10' at 60° C
▼
Run 10' at 40° C
▼
Drain

3.8.11. P^H Check In Different Point In Dyeing Processes

Name		Range
Bio-Polish	==========	4.5-5.0
Leveling	==========	5.5-6.0
Salt	==========	6.0-6.5
Soda	==========	10.5-11.5

Dye bath ========== 10.5-11.5

Soaping ========== 6.0-6.5

Softener ========== 4.5-5

Fixing ========== 5.0-5.5

3.9.Raw Materials Used In Different Sections

3.9.1. Raw Material for Knitting

The raw material for knitting is the yarn. Different types of yarn of wide range of count are used. In yarn store section we had the chance to know about different yarns of different count used in knitting. We also have known different yarn manufacturer/suppliers name for this knitting section i.e. sources of yarn. Both carded and combed yarn is used for knitting.

Generally used yarn and their	
Cotton	24^S, 26^S, 28^S, 30^S, 32^S, 34^S, 40^S
Polyester	75D, 100D
Spandex yarn	20D,40D, 70D
Grey Mélange (C_	24^S, 26^S
EcruMélange (C-85% V-15%)	24^S, 26^S, 28^S
PC (65%Polyester & 35% cotton)	24^S, 26^S, 28^S, 30^S
CVC	24^S, 26^S, 28^S, 30^S

3.9.2. Raw Materials for Dyeing

In the industry the raw materials used for production are:

1. Grey fabrics
2. Dyes
3. Chemicals.

1. Grey Fabrics:

Following types of gray fabrics are dyed:

1. Single jersey
2. Single jersey withLycra
3. Polo pique
4. Single lacoste
5. Fleece
6. Interlock
7. Interlock with Lycra
8. Rib
9. Rib withLycra
10. 1X1 rib
11. 2X2 rib
12. Different types of collar & cuff

2. Dyes

The following dyes are used:

1.Reactive

2. Disperse

Name of Dyes	Origin	Supplier
Cibacron Yellow - F4G	Switzerland	Swiss color
Cibacron Yellow FN2R	Switzerland	Swiss color
Cibacron Orange – FNR	Switzerland	Swiss color
Cibacron Scarlet -F3G	Switzerland	Swiss color
Cibacron Red-FN3G	Switzerland	Swiss color
Cibacron Red-FNR	Switzerland	Swiss color
Cibacron Red-FN2BL	Switzerland	Swiss color
Cibacron Scarlet -FN6G	Switzerland	Swiss color
Cibacron Navy –WB	Switzerland	Swiss color
Cibacron Red -WB 150 %	Switzerland	Swiss color
Cibacron Red -HDN 200 %	Switzerland	Swiss color
Cibacron Turquish -HGN	Switzerland	Swiss color
Terasil Black SRL-O1	Switzerland	Swiss color
Terasil Black W-NS	Switzerland	Swiss color
Terasil Blue BGE-01	Switzerland	Swiss color
Terasil Blue WBLS	Switzerland	Swiss color
Terasil Navy GRLC	Switzerland	Swiss color
Terasil Red WRS	Switzerland	Swiss color
Terasil Violet BL-01	Switzerland	Swiss color
Terasil Yellow W-4G	Switzerland	Swiss color
Remazol Blue-RR	German	Dyester
Remazol Yellow-RR	German	Dyester
Remazol Red –RR	German	Dyester
Remazol Tarquise Blue-G	German	Dyester
Livafix Rubina CA	German	Dyester
Livafix Red CA	German	Dyester
Livafix Blue CA	German	Dyester
Livafix Yellow CA	German	Dyester

Reactive Black B	China	LC
Reactive Red 3RS	China	LC
SumifixYellowEXF	China\Indonesia\Japan	Fakir dyes
Sumifix Red EXF	China\Indoneshia\Japan	Fakir dyes
Sumifix Blue EXF	China\Indoneshia\Japan	Fakir dyes
Sumifix T. Blue GN	China\Indoneshia\Japan	Fakir dyes
Sumifix Red 3BS	China\Indoneshia\Japan	Fakir dyes
Sumifix Yellw 3RS	China\Indoneshia\Japan	Fakir dyes
Sumifix Yellw GR	China\Indoneshia\Japan	Fakir dyes
Sumifix Blue BRF	China\Indoneshia\Japan	Fakir dyes
TerasilYellow - F4G	Singapore	Swiss color
TerasilOrange – FNR	Singapore	Swiss color
TerasilScarlet -FN6G	Singapore	Swiss color
TerasilRed-FN3G	Singapore	Swiss color
Livafix Amber CA	German	Dyester
Livafix Orange CA	German	Dyester
Reactive Black GRC	China	LC

3. Chemicals:

Chemicals Name	Supplier	Price (Tk/Kg)	Mode of Action
Kappasol AF 200	Kappachem	371	Antifoam
Kappwet BOS	Kappachem	350	Wetting (Detergent)
Kappquest FE	Kappachem	147	Sequestering
Kappazone H53	Kappachem	142	Peroxide stabilizer
Kappasoft BD	Kappaachem	283	Cationic Softener
Kappasoft SM	Kappachem	284	Silicon Softener
Kappatex R98	Kappachem	345	Reducing Agent
Invatex PC	CIBA	139	Peroxide Killer
Silvatol FLN	CIBA	467	Anti Oil
Cibecel DBC	CIBA	176	Leveling gent
Anti per R	Gentec	210	Peroxide Killer
Anti per PRB	Gentec	211	Peroxide Killer
Eriopon OS	CIBA	573	Reducing agent
Invatex AC	CIBA	180	Core neutralizing
Cibafix ECO	CIBA	396	Fixing
Tinofix FRD	CIBA	316	Fixing
Irgasol DAM	CIBA	271	Fixing Remover
Cibatex AB45	CIBA	188	High Temp. pH Stabilizer
Univadine DIF	CIBA	468	DisperseLevelingAgent
Romapon 173	Dystar	88.53	Anticrease
Uni enzyme 1000	Hunan	290	Enzyme
Acetic Acid	Taiwan	89	Acid
Soda Ash	China	26	Alkali

Glaubar Salt	China	16.28	Electrolyte
Caustic Soda	China	52.34	Alkali
Hydrogen peroxide 50%	India	45.4	Bleaching Agent

3.10. Finishing Section

Textile finishing, in a restricted sense, is the term used for a series of processes to which all bleached, dyed, printed & certain grease fabrics are subjected before they are put to market. It's one of the most important operation in knit processing.

3.10.1. Objectives of Finishing

-Improving the appearance, luster, whiteness etc.

-Improving the feel, which depends on the handle of the material & its softness, suppleness, fullness etc.

-Wearing qualities, non- soiling, anti-crease, anti-shrink comfort etc .

-Special properties required for particular uses -water -proofing flame proofing etc .

-Covering of the faults in the original cloth.

-Increasing the weight of the cloth.

3.10.2. Effects of Finishing

-Easy care.

-Crease recovery.

-Dimensional stability

-Good abrasion resistance

-Improved tear strength

-Good sew ability

- Soft or stiff handle

-Shine or luster

Knit fabrics require finishing process after dyeing. During dyeing all knit fabrics are dyed in tubular form. According to buyers requirement dyed fabrics are finished in either Tubular form or Open-width form.

Depending on which Finishing sections are separated into two sections – OPEN & TUBE section

3.10.3. Open-Finish Section

Those fabrics which are to be cut in open form in garment section as per buyer requirement are finished in open form in this section.

The flow of process is as follows

Hydro extractor

↓

Slitting & dewatering

↓

Stenter

↓

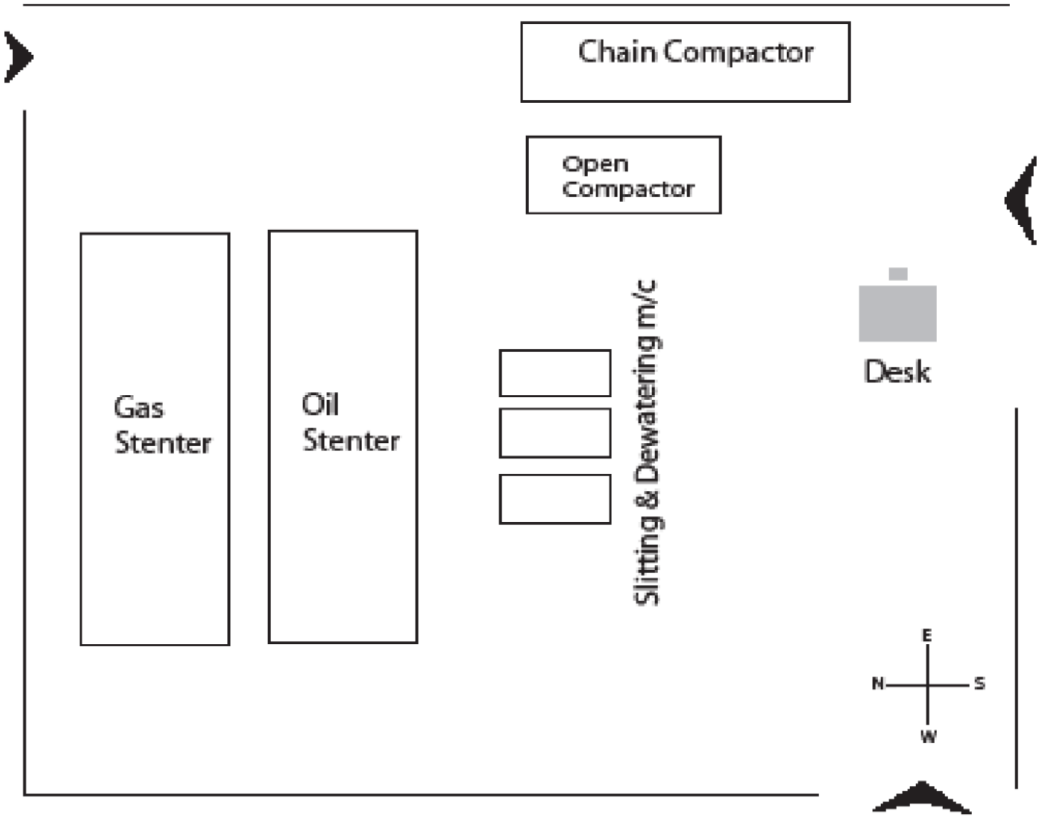
Compactor

↓

Q.C

↓

Delivery



Layout of Open-Finish Section

3.10.4. TUBULAR FABRIC FINISH SECTION

Tubular fabrics are generally used for Ladies wear & Baby dress. In KCL huge orders of tubular product are manufactured.

The Machines or Finishing Sequence for Tube-Finishing are as following –

Hydro extractor

↓

Dryer

↓

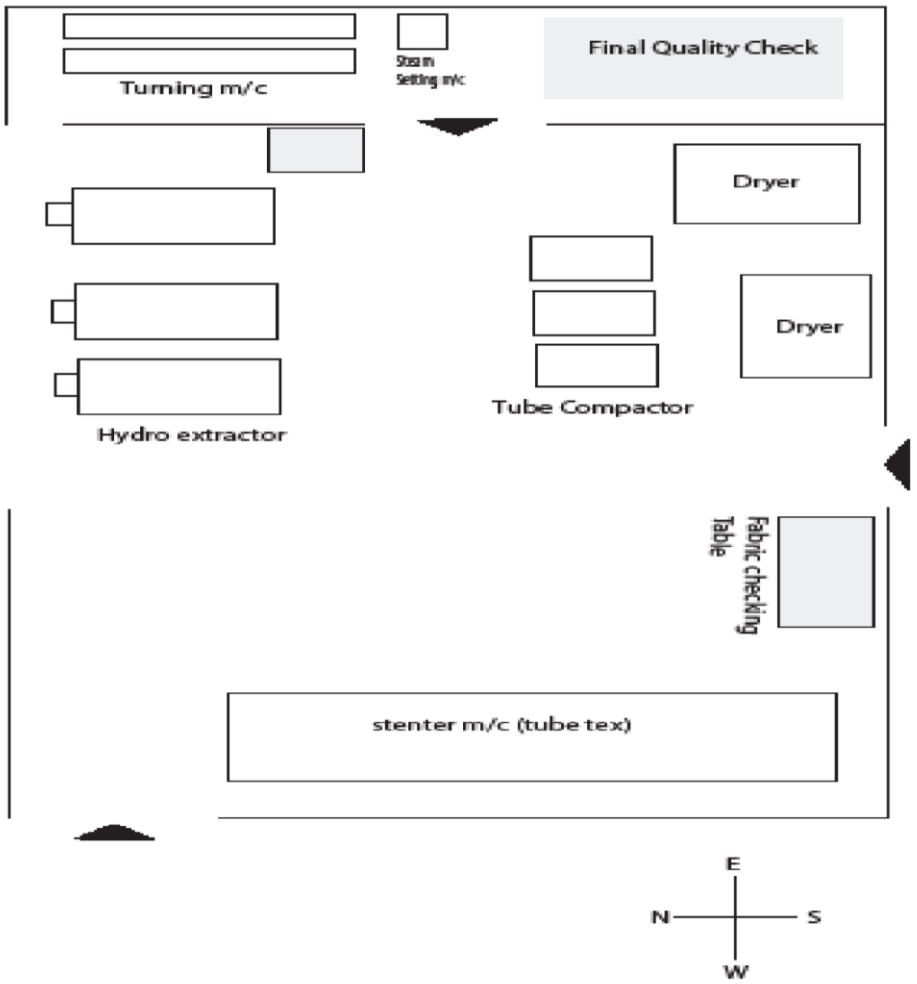
Turning m/c

↓

Plaiting m/c or Steam setting m/c

↓

Tube Compactor



Layout of Tube-Finish Section

3.10.5. HYDRO-EXTRACTOR-PADDER

Manufacturer : SANTEX, SWITZERLAND
No. of m/c : 2
Manufacturer : BIANCO, ITALY
No. of m/c : 1

Function:

- To remove the excess water inherited by the fabric during Dyeing.
- To clean any unnecessary dirt or hairs of fibers.
- To soften the fabric if required by using softening agent.
- Slight controlling of Dia of tube fabric by using 'Shaper'.

Important Parts & Zones:

- Detwiste:Un-rove the roped form fabric after dyeing by twisting & turning.
- J-Box :Overfeeding zone, which ensures tension-free movement of fabric.
- Water & Softener bath: 1st bath is only water, 2nd one is for softener.
- Padder:Two pairs of padding rollers set at the top of each bath. They squeeze the excess water from the fabric.
- Ring & Ring Pulley: Works as a guide of fabric & maintain required Dia.

3.10.6. DRYER

Manufacturer : SANTEX, SWITZERLAND.
FONG'S, HONGKONG.

Function:

→To dry the wet fabric.
→Control the shade &gsm slightly.

Main Parts:

→Feed unit; contains conveyor belt & number of rollers. →Two drying sections – i) upper level (3 chambers) ii) Lower level (3chambers)
→Heating system associated by STEAM Line & Nozzles.

→Blower, to spread the steam through-out the chambers.

→Exhaust air ventilator.

3.10.7. TUBE COMPACTOR

Manufacturer : SANTEX, SWITZERLAND

No. of m/c – 1

TUBETEX,USA

No. of m/c – 2

Function:

→To control Dimensional stability of fabric.

→Control GSM of fabric.

→Make Shiny effect on fabric surface.

Main Parts of Compactor:

→Feed section – tension control & metal detector.

→Shape – Set according to the dia of fabric →Steam zone.

→Take out &Plaiter zone

→Compacting Zone: It's a roller & shoe arrangement & the most important zone which consists of two rollers, the **Feed roller** (recarter roller) & the **Retard roller**.

They are heated by **Shoe,** into which hot thermo-oil runs through.

Cross-section of Compacting Zone

3.10.8. SLITTING MACHINE

No. of machines : 3

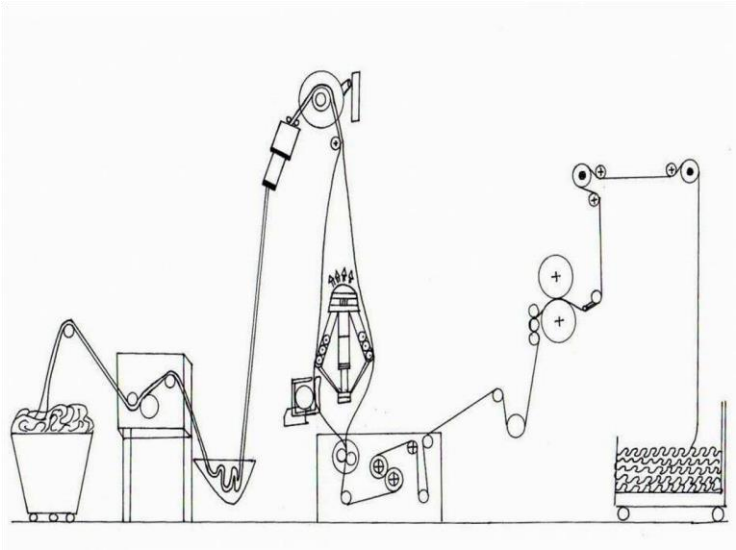
Manufacturer : BIANCO, ITALY.

Function:

→Slit-cut the tubular fabric through the needle mark.

→Remove excess water.

→Prepare the fabric for next operation.



Material Passage (Left to Right)

Main Parts:

→Squeezer

→J-box

→Detwister

→Spreader

→Rotary cutting blade

→Auto Centering system

→Conveyor &Plaiter

Technical Parameters:

→Speed	:	Varies with type of fabric
→Overfeed	:	In feed zone, cutting zone, Conveyor belt (20-30%)
→Pressure	:	In Detwister zone-0.5 bar, in Padding – 4-5 bar

Main Parts:

→Squeezer

→J-box

→Detwister

→Spreader

→Rotary cutting blade

→Auto Centering system

→Conveyor &Plaiter

3.10.9. STENTER

No. of machine : 3

Manufacturer : BRUKNER, GERMANY (2)
TUBETEX, USA (1)

Function:

→To dry the fabric.

→Heat-set the synthetic fiber fabric.

→Controlling the width of fabric or maintain dimensional stability.

→Controlling the GSM of fabric.

→Skew ness & Bowing controlling of stripe fabric.

→Spirality& Twisting control.

→Fabric hand-feel modification-like-Softening or Hardening. →Shade control.

→Gumming & Cutting.

Important Zones & Parts:

- Back Zone
- Guider
- Two Baths & Padder or Squeezer
- Auto centering →Middle Zone
- -Over feed regions
- Chain & clip system
- Chambers (Contains blower, heater, recovery)
- Front Zone
- Static electricity remover.

Technical Parameters:

- Gas (for Gas-Stenter)
  Thermo-Oil (for Oil-Stenter)
- Working Width : 600-2600 mm
- Total Length : 138 ft
- No. of Chambers : 8
- Chamber length 10 ft each
- No of Motors : 96
- Padder Pressure : Max. air Pressure – 10 bar (avg. 5-7)
  Max. Steam Pressure – 0.7 bar
- Overfeed Ratio : Back Zone – 0-5
  Master overfeed – 80% (in case of heat-set 15-20%)
  Wheel overfeed – 3%
  Feed overfeed – 3-5%
  Take-up overfeed – 15-20%
- Temperature : Normal – 130-150°c
  Heat-Set – 180-210°c

- Speed of Passing Fabric : Normally 35-40 m/min Heat set 18-22 m/min
- Width Controlling : S/j +1-2 inches
  Interlock/Rib - 1%
  Lycra +8-10%
- Padder bath capacity : 250 lit
- Types of Softener used : White, Color, Silicon Softener

Production:

Capacity: 5 tones/shift

Actual production: 3.5-4.5 tones/shift

Heating Arrangement

For Gas Stenter: Rotamatic Burner
For oil Stenter: Thermo-oil

3.10.10.OPENWIDTH COMPACTOR

M/C quantity	:	01
Brand	:	Brukner, Germany
Maxm line speed	:	60 m/min
Useable line speed	:	30 m/min Maxm dia :95 "
Workable dia	:	90"
Steam box temp.	:	80° C
Feed R/L temp.	:	105° C
Over feed (%)	:	upto 50 %
Shoe pressure	:	Max-18 Min-5
Sensor Position	:	-Shoe pressure (One shoe)

Function of the Machine:

→To compact the fabric
→To control the shrinkage
→To maintain proper width and G.S.M

Heating system: Steam

Main parts of the machine:

- ✓ Heating chamber
- ✓ Blower (2, one at the entry chain zone for uncurling and another at the entry of compacting zone)
- ✓ Synthetic blanket as a conveyor,
- ✓ Folder

- ✓ Exhaust fan
- ✓ Unpinning cylinder (-40%→+40%)
- ✓ Belt cylinder (-40%→+40%)
- ✓ Uncurling device at entry of compacting zone.
- ✓ sensor
- ✓ brush roller

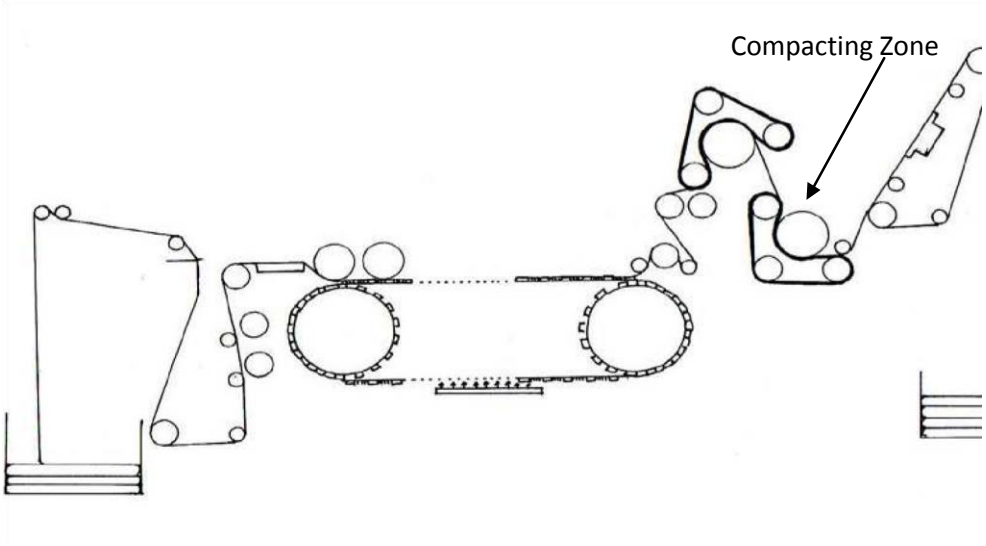


Fig. Material Passage

Production: Capacity: 5 tones/shift or 10 tons/day
Actual production: 4 tones/shift.

Utility: Steam Electricity, Compressed air.

3.11. SPECIAL FINISHING SECTION

3.11.1. SUEDING OR CARBON FINISHING OR PITCH FINISHING

No. of m/c : 2

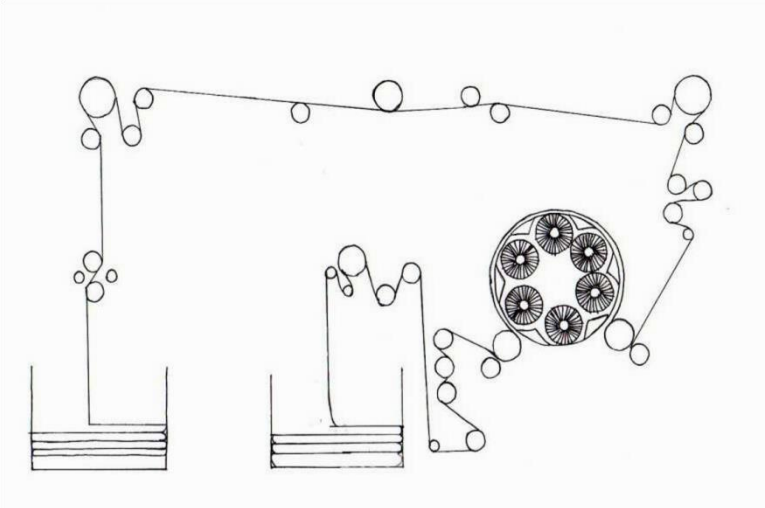
Manufacturer: LAFER, ITALY

Function :

- ✓ Make the surface of fabric Smooth Improve heat insulation properties.
- ✓ Good Hand feel.

Technical Parameters:

- ✓ Types wires – Carbon
- ✓ Fabric speed – S/J : 8-11 rpm
- ✓ Rib/Interlock: 9-10 rpm
- ✓ Terry fleece: 10-11 rpm Tension – 10-16 kg-wt
- ✓ Drum rpm – 20-25 rpm



Specification: No of motor: 08

- ✓ Winch speed: 10-30m/min
- ✓ Machine speed: 50m/min (max)
- ✓ Drum speed: 30-35-50 rpm (Max 70)
- ✓ Pile roller no: 06

- ✓ Pile made of Plastic
- ✓ Plaiter tension: 6kg
- ✓ Taker in tension: 20kg
- ✓ Fabric return driver Tension: 25kg

Material Passage

- ✓ Drum Tension: 50kg
- ✓ Speed range: 10-40 m/min
- ✓ No of cylinder/drum: 2 for double cylinder
- ✓ 1 for single cylinder
- ✓ No of pin roller: 24× 2 = 48
- ✓ 24× 1= 24
- ✓ Cylinder r.p.m (General): 100
- ✓ Tension: 3 kg

3.11.2. RAISING OR BRUSHING

- ✓ M/C quantity : 01 Brand -GEMATEX
- ✓ Model: KRM 6725
- ✓ Origin-Germany
- ✓ Year of manufacture-1999
- ✓ Voltage - 400 V
- ✓ Nominal Current -63 A
- ✓ No of Pile :12
- ✓ No of Counter-Pile :12

Function:

- ✓ To raise or tear-out the extra thread loops on the back-side of fabric Increase the warmth of fabric.

3.11.3. **SINGEING**

No. of m/c - 1

Manufacturer- OSTHOFF – SENGE, GERMANY

Function

To remove the hairs form fabric surface by burning in extremely heated flame.

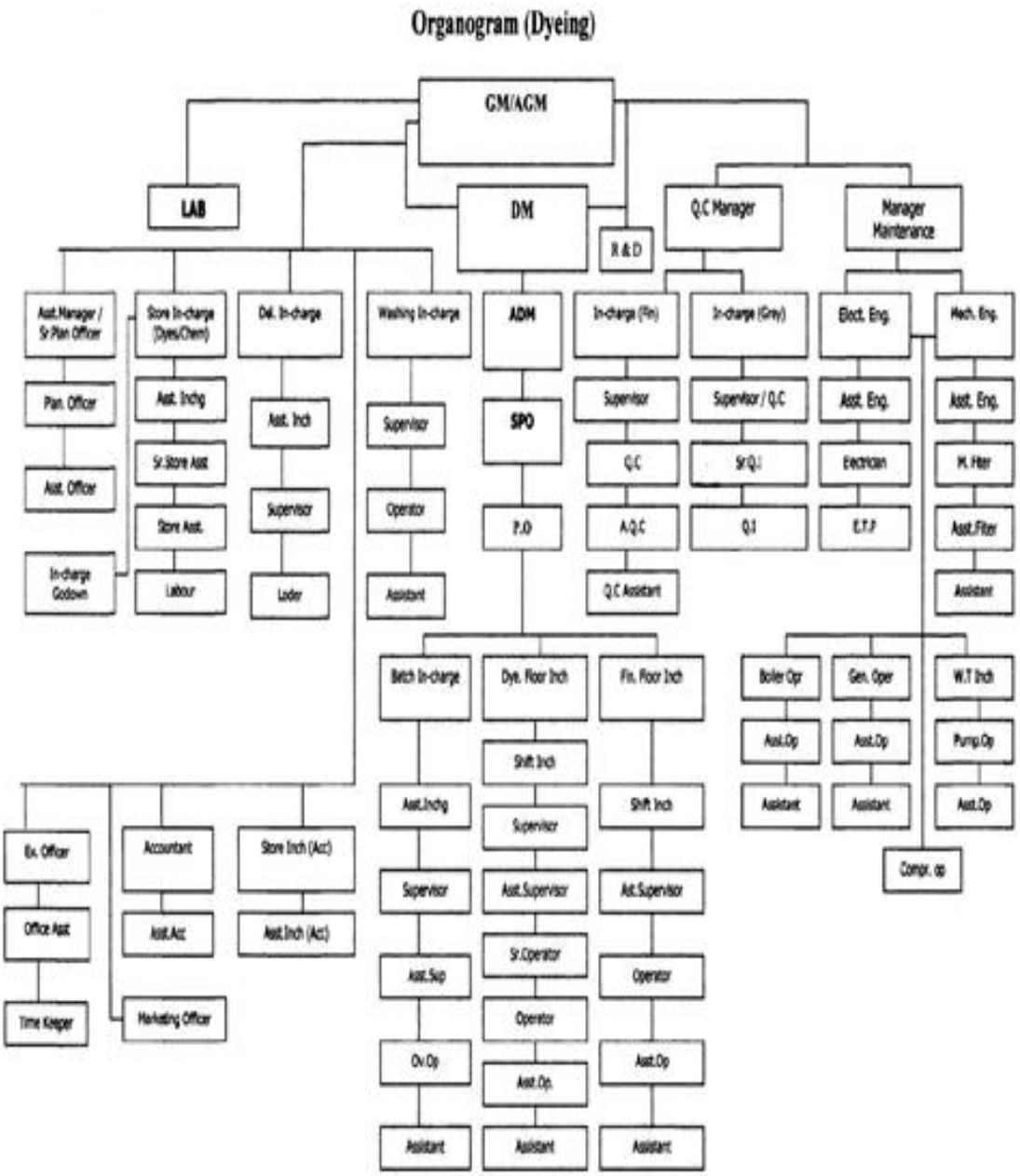
Technical parameters

Flame temperature: 100-110°c

Fabric speed : max 90 m/min

3.12. Yarn Dyeing

3.12.1. Organogram Of Yarn Dyeing



3.12.2. **Shift Change**:

Shift	From	To
A	6:00 am	2:00 pm
B	2:00 pm	10:00 pm
C	10:00 pm	6:00 am

Figure : Yarn Dyeing Unit

3.12.3. **Machine Description**

Machine Type, Brand and Origin and Machine Quantity:

TYPE	BRAND & ORIGIN	M/c QUANTITY
Yarn Dyeing Machine	FONG"S, China	21
Soft Winding Machine	SSM, Switzerland	05
Soft Winding Machine	FADIS, Italy	02
Hard Winding Machine	SSM, Switzerland	03
Hard Winding Machine	FADIS, Italy	02
Aquasplicer	MESDAN, Italy	08

Soft Thread Winding	SSM, Switzerland	01
Hydro	DETTIN, Italy	02
Dryer	STRYFIELD, England	02
Dryer	STALAM, Italy	01
Auto Dosing		
Silos-Dos	LAWER, Italy	02
Dos-Chem.	LAWER, Italy	04
Rotary Dyes Store	LAWER, Italy	01
Total		**54**

Soft Winding

Machine Specification:

Machine No: 01 Brand Name: SSM-TW2-W Type: TW2-W No of Spindle: 78 M/c No: 856.0130/06 M/A No: Year 2007 U: 400V I_{max}: 38A f: 50Hz	**Machine No: 02** Brand Name: SSM-PS6-W Type: PS6-W No of Spindle: 60 M/c No: 883.0427/06 M/A No: Year 2007 U: 400V I_{max}: 32A f: 50Hz
Machine No: 03 Brand Name: SSM-PS6-W Type: PS6-W No of Spindle: 60 M/c No: 883.0428/06 M/A No: Year 2007 U: 400V I_{max}: 32A f: 50Hz	**Machine No: 04** Brand Name: SSM-PS6-W Type: PS6-W No of Spindle: 60 M/c No: 883.04279/06 M/A No: Year 2007 U: 400V I_{max}: 32A f: 50Hz
Machine No: 05 Brand Name: SSM-PS6-W Type: PS6-W No of Spindle: 60	**Machine No: 06** Brand Name: FADIS-SINCRO T-FT P300 Type: SINCRO T-FT P300

M/c No: 8830430/06 M/A No: Year 2007 U: 400V I_{max}: 32A f: 50Hz	Plate No: G0022DX No of Spindle: 96 Year: 2008 Power KW: 12 Volts: 440 Ampere: 16

Machine No: 07
Brand Name: FADIS-SINCRO T-FT P300

Type: SINCRO T-FT P300

Plate No: G0023SX

No of Spindle: 96

Year: 2008

Power KW: 12

Volts: 440

Ampere: 16

YARN DYEING MACHINE SPECIFICATION

Sample Dyeing Machine:

Machine No: 01	**Machine No: 02**
Model: Microwin-1	Model: Microwin-1
M/c Capacity: 250 gm	M/c Capacity: 300 gm
Package Capacity: 01	Package Capacity: 01
Serial No: 32022973T	Serial No: 330242855T
Date/Year Built: 2007	Date/Year Built: 2008
Cert No: SHI 07180069/46	Cert No: SHI 0830002/118
Design Code: PD 5500 2006 CAT2	Design Code: PD 5500 2006 CAT2
Design Pressure: 520 KPa	Design Pressure: 520 KPa
Design Temperature: 140°C	Design Temperature: 140°C
Hydraulic Test Pressure: 800 KPa Safety Valve Set: 520 KPa	Hydraulic Test Pressure: 800 KPa Safety Valve Set: 520 KPa

Machine No: 03 Model: Labwin-12 M/c Capacity: 14 Kg Package Capacity: 12	**Machine No: 04** Model: Labwin-12 M/c Capacity: 14 Kg
Serial No: 31021466T Date/Year Built: 2007 Cert No: SHI 0718016/17 Design Code: PD 5500 2006 CAT2 Design Pressure: 700 KPa Design Temperature: 170°C Hydraulic Test Pressure: 1200 KPa Test Date: 2008 Safety Valve Set: 700 KPa Heating/Cooling Medium: Steam Dye liquid	Package Capacity: 12 Serial No: 31021467T Date/Year Built: 2007 Cert No: SHI 0718016/16 Design Code: PD 5500 2006 CAT2 Design Pressure: 700 KPa Design Temperature: 170°C Hydraulic Test Pressure: 1200 KPa Test Date: 2008 Safety Valve Set: 700 KPa Heating/Cooling Medium: Steam Dye liqui
Machine No: 05 Model: Labwin-6 M/c Capacity: 7 Kg Package Capacity: 6 Serial No: 31021465T Date/Year Built: 2007 Cert No: SHI 0718016/5 Design Code: PD 5500 2006 CAT2 Design Pressure: 700 KPa Design Temperature: 170°C Hydraulic Test Pressure: 1200 KPa Test Date: 2008 Safety Valve Set: 700 KPa Heating/Cooling Medium: Steam Dye liquid	Machine No: 06 Model: Labwin-6 M/c Capacity: 7 Kg Package Capacity: 6 Serial No: 31020961T Date/Year Built: 2006 Cert No: SHI 0615548/5 Design Code: PD 5500 2006 CAT2 Design Pressure: 700 KPa Design Temperature: 170°C Hydraulic Test Pressure: 1200 KPa Test Date: 2008 Safety Valve Set: 700 KPa Heating/Cooling Medium: Steam Liquid

Dyeing Machine:

Machine No: 01 Brand Name: FONG"S Model: Allwin-43 M/c Capacity: 30 Kg Liquor Ratio Capacity: 180 Liter Package Capacity: 24 No of Spindle: 04 Serial No: 31021468T	**Machine No: 02** Brand Name: FONG"S Model: Allwin-53 M/c Capacity: 50 Kg Liquor Ratio Capacity: 285 Liter Package Capacity: 36 No of Spindle: 06 Serial No: 31021469T
Cert No: SHI 0718016/7 Year Built: 2007 Design Code: PD 5500 2006 CAT2 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2007 Safety Valve Set: 520 KPa	Cert No: SHI 0718016/9 Year Built: 2007 Design Code: PD 5500 2006 CAT2 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2007 Safety Valve Set: 520 KPa
Machine No: 03 Brand Name: FONG"S Model: Allwin-53 M/c Capacity: 60 Kg Liquor Ratio Capacity: 320 Liter Package Capacity: 48 No of Spindle: 06 Serial No: 31021470T Cert No: SHI 0718016/11 Year Built: 2007 Design Code: PD 5500 2006 CAT2 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2007 Safety Valve Set: 520 KPa	**Machine No: 04** Brand Name: FONG"S Model: Allwin-70 M/c Capacity: 100 Kg Liquor Ratio Capacity: 580 Liter Package Capacity: 81 No of Spindle: 09 Serial No: 31020960T Cert No: SHI 0615548/111 Year Built: 2006 Design Code: PD 5500 2006 CAT2 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2006 Safety Valve Set: 520 KPa

Machine No: 05 Brand Name: FONG‟S Model: Allwin-85 M/c Capacity: 200Kg Liquor Ratio Capacity: 1150 Liter Package Capacity: 162 No of Spindle: 18 Serial No: 31021471T Cert No: SHI 0718016/53	**Machine No: 06** Brand Name: FONG‟S Model: Allwin-85 M/c Capacity: 200 Kg Liquor Ratio Capacity: 1150 Liter Package Capacity: 162 No of Spindle: 18 Serial No: 31021472T Cert No: SHI 0718016/70
Year Built: 2007 Design Code: PD 5500 2006 CAT2 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2007 Safety Valve Set: 520 KPa	Year Built: 2007 Design Code: PD 5500 2006 CAT2 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2007 Safety Valve Set: 520 KPa
Machine No: 07 Brand Name: FONG‟S Model: Allwin-120 M/c Capacity: 400 Kg Liquor Ratio Capacity: 2400 Liter Package Capacity: 324 No of Spindle: 36 Serial No: 32022972T Cert No: SHI 0718069/64 Year Built: 2007 Design Code: PD 5500 2006 CAT2 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2007 Safety Valve Set: 520 KPa	**Machine No: 08** Brand Name: FONG‟S Model: Allwin-120 M/c Capacity: 400 Kg Liquor Ratio Capacity: 2400 Liter Package Capacity: 324 No of Spindle: 36 Serial No: 31021473T Cert No: SHI 0718016/100 Year Built: 2007 Design Code: PD 5500 2006 CAT2 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2007 Safety Valve Set: 520 KPa
Machine No: 09 Brand Name: FONG‟S	**Machine No: 10** Brand Name: FONG‟S

Model: Allwin-145 M/c Capacity: 600 Kg Liquor Ratio Capacity: 3000 Liter Package Capacity: 486 No of Spindle: 54 Serial No: 32023066T Cert No: SHI 0718075/21 Year Built: 2007 Design Code: PD 5500 2006 CAT2	Model: Allwin-145 M/c Capacity: 600 Kg Liquor Ratio Capacity: 3000 Liter Package Capacity: 486 No of Spindle: 54 Serial No: 32023065T Cert No: SHI 0718075/19 Year Built: 2007 Design Code: PD 5500 2006 CAT2

Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2007 Safety Valve Set: 520 KPa	Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2007 Safety Valve Set: 520 KPa
Machine No: 11 Brand Name: FONG‟S Model: Allwin-145 M/c Capacity: 600 Kg Liquor Ratio Capacity: 3000 Liter Package Capacity: 486 No of Spindle: 54 Serial No: 31021474T Cert No: SHI 0718016/55 Year Built: 2007 Design Code: PD 5500 2006 CAT2 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2007 Safety Valve Set: 520 KPa	**Machine No: 12** Brand Name: FONG‟S Model: Allwin-145 M/c Capacity: 800 Kg Liquor Ratio Capacity: 4600 Liter Package Capacity: 648 No of Spindle: 54 Serial No: 31021475T Cert No: SHI 0718016/33 Year Built: 2007 Design Code: PD 5500 2006 CAT2 Design Pressure: 520 KPa Design Temperature: 140°C Hydraulic Test Pressure: 800 KPa Test Date: 2007 Safety Valve Set: 520 KPa
Machine No: 13 Brand Name: FONG‟S Model: Allwin-166 M/c Capacity: 1000 Kg Liquor Ratio Capacity: 5600 Liter Package Capacity: 788 No of Spindle: 69 Serial No: 31021476T Cert No: SHI 0718075/103 Year Built: 2007 Design Code: PD 5500 2006 CAT2 Design Pressure: 520 KPa Design Temperature: 140°C	**Machine No: 14** Brand Name: FONG‟S Model: Allwin-205 M/c Capacity: 1600 Kg Liquor Ratio Capacity: 8600 Liter Package Capacity: 1296 No of Spindle: 108 Serial No: 31021477T Cert No: SHI 0718075/111 Year Built: 2007 Design Code: PD 5500 2006 CAT2 Design Pressure: 520 KPa Design Temperature: 140°C

Supply Phase: 3
Supply KVA: 230
Supply Power Factor: 0.9
RF Power Output: 100 KW
Operating Frequency: 27 MHz
Date of Manufacturing: 2007
Country of Origin: U.K

Machine No: 03
Machine Name: Stalam
Machine Type: Textile Dryer
Model: RF 150 KW

Module No: 1/1

Module Weight: 3950 Kg

Package
Conveyor Length: 9.75 m
Conveyor Width: 1.75 m
Installed Power: 250 KVA
Maximum Current: 38 A
Short Circuit Current: 100 KA
Matriculation No: 1869/1
Voltage Supply: 400 V+/-5%
Phase: 3-Earth
Frequency: 50 Hz+/-2%
Year: 2009
Made: Italy

HARD WINDING MACHINE SPECIFICATION

Machine No: 01	**Machine No: 02**
Brand Name: SSM Type: CW2-W No of Spindle: 96 M/c No: 863.0029/07 U: 400 V I_{max}: 28 A f: 50 Hz Made: Switzerland	Brand Name: SSM Type: CW2-W No of Spindle: 96 M/c No: 863.0027/07 U: 400 V I_{max}: 28 A f: 50 Hz Made: Switzerland
Machine No: 03	**Machine No: 04**
Brand Name: SSM Type: CW2-W No of Spindle: 96 M/c No: 863.0028/07 U: 400 V I_{max}: 28 A f: 50 Hz Made: Switzerland	Brand Name: FADIS Type: SNCRO T-FT/RT P 300 Plate No: G 0024 DX No of Spindle: 96 Year: 2008 Power KW: 12 Volts: 440 Ampere: 16 Made: Italy

Machine No: 05

Brand Name: FADIS

Type: SNCRO T-FT/RT P 300

Plate No: G 0025 SX

No of Spindle: 96

Year: 2008

Power KW: 12

Volts: 440

Ampere: 16

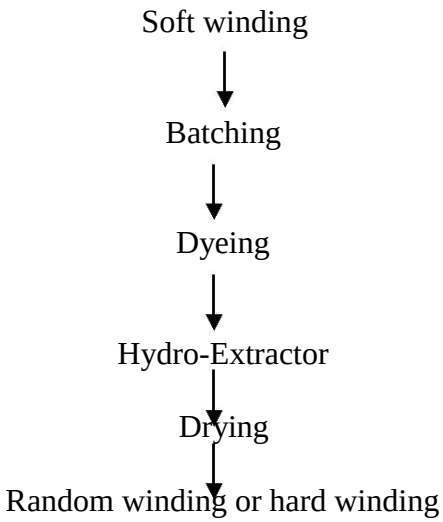
Made: Italy

3.12.4. **PRODUCTION MANAGEMENT**

Production Parameter:

Process	**Temperature (ºC)**	P^H	**Time (min)**	**M:L rato**
Scouring and Bleaching	98 ºC	11.5-12.0	60	1.8
Enzyme Wash	55 ºC	4.5-5.0	60	1.8
Enzyme Deactivation	70 ºC	10.5	10	1.8
Reactive Dyeing (Light Shade)	60 ºC	10.9-10.12	60	1.8
Reactive Dyeing(Dark Shade)	60 ºC	10.9-10.12	10.5-11.5	1.8
White Shade	98 ºC	10.9-11.5	60	1.8
Turquise Color Dyeing	80-90 ºC	10.9-10.12	90	1.8
Polyester Dyeing	130 ºC	4.5	45	1.8

3.12.5. Flow Chart Of Package Dyeing Machine



3.12.6. **Scouring & Bleaching**

Scouring and bleaching are also known as pre-treatment. The main purpose of scouring cotton fabrics is to remove natural as well as added chemicals of essentially hydrophobic character as completely a possible and leave the fabric in a high absorptive condition without undergoing chemical or physical damage significantly and also to make the goods suitable for removing the natural coloring matter of the cotton during the subsequent process.

Process:

- At first the fabric is loaded on to the bath.
- Required amount of water is taken to the bath.
- Wetting agent Anti-creasing agent added.
- Scouring agent (Caustic/Soda) and Stabilizer are added by the aid of dosing when the temperature reached at 50ºC.
- H_2O_2 is added by the aid of dosing system for 05 minute.
- Temperature is raised to 98ºC and the process is carried for 60 minute.
- The liquor is drained at 80ºC.
- After that chemical wash and enzyme wash are done.

3.12.7. **Dyeing**

The yarn package must be stable enough, to withstand the handling during loading, processing and unloading from the machine. It should withstand the temperature change and flow volume and flow direction of liquor. It should accommodate a small amount of shrinkage and swelling during processing with temperature increase as well as wetting.

Package weight and density:

The package weight and density are two important parameters which are to be standardized for uniform and trouble free dyeing .The packages may be soft or hard these should conform to the standards, when too soft liquor flowing through it will find the course of least resistance and cause channeling, which leaves some parts of the package relatively undyed or lighter. If the packages are wound too hard, a point can be reached where the flow of liquor is impeded to such an extent that poor dyeing or none may occur. The package weight and dimensions depends upon the type of the machine, its flow rate, automation, type and construction of the yarn to be dyed, dye class to be used and type of package holder to be used. The typical density norms for different type of yarns is between 350-450 gm/ltr.The most important requirement of soft package for dyeing are-

- Density of the package should be uniform throughout of the package diameter, ie the layer to layer density is controlled.
- The packages should not have the hard edges, or these must be broken or cupped by a suitable device or manually.
- The package weight must be controlled and all the packages must fall within the standard norms.
- The density variation from one package to another must be controlled statistically and CV5% should not exceed 5%

Process Sequence of Soft winding: Creel with supply package

↓

Inlet Eye

↓

Pre-tensioner

↓

Feeder

↓

Yarn Tensioner

↓

Waxing Device

↓

Yarn Sensor

↓

Yarn Tension Sensor

↓

Loop catcher

Guide Rod

↓

Winding Head

$$\text{Density, } \rho = \frac{M}{\Pi \times \{(D_1/2)^2 - (D_2/2)^2 \times h}$$

Where,

M = Total Package Weight, D_1 = Package dia, D_2 = Bobbin dia, h = Package Length or Height

- Per day production soft winding = 1.5 Tons.
- Average Density of Soft winding Package = 0.372 - 0.500 gm/cm^3.

$$\text{Per day Production Calculation} = \frac{\text{M/c rpm} \times \text{No of Spindle} \times \text{Efficiency} \times 60 \times \text{day}}{\text{Count} \times 840 \times 100} \text{ lb}$$

3.12.8. MACHINE PACKAGE DYEING

Package dyeing machines are the most widely used now a days for dyeing of almost all type of yarns, due to economical, automatic and accurate dyeing results. The term package dyeing usually denotes for dyeing of any type yarn wound on the compressible dye springs/perforated solid dyeing tubes or cones. Yarn dyeing in package form is done at high temperature and under high pressure, with the packages mounted on hollow spindles .These spindles are fixed on the dyeing carriers, which is inserted into the dyeing vessel after closing the lid of the machine, the dyeing liquor is forced through the packages in two way pattern (inside to out and outside to in) and goes on circulating throughout the vessel and yarn.

All operations from pretreatment to finishing can be performed in the same machine, without taking out the material out of the machine.

3.12.9. Main Parts of The Machines:

1. Main kier or the main vat in which the actual dyeing is being carried out.
2. Expansion or addition tank
3. Stock or preparation tank
4. Main pump
5. Injector or dosing pump
6. Dyeing carrier
7. Sampling device
8. Back cooler in fully flooded models
9. Control panel

Working principle of package dyeing machine:

The material to be dyed is wound on the dye springs, perforated plastic cheeses or steel cones and loaded in the carrier spindles, which are compressed and bolted at the top to make a uniform and homogeneous dyeing column. The liquor containing dyes chemical and auxiliaries is forced through with the help of pump, and circulated through the material from inside –out and is reversed periodically so that each and every part of the material get the same and uniform treatment. The dyeing cycle is controlled through a micro-computer and different chemicals may be added through the injector pump or color kitchen at any stage of dyeing.

In case of fully flooded machines, the liquor expands with the rise in temperature (approximately 5% volume increases from 30-130 degree centigrade temperature) is taken back in the expansion tank through a back cooler. This extra water is then again injected to the dyeing vessel through an injector pump. Expanded volume of the dye liquor is thus remains in continuous circulation in the system.

Any type of addition can be done to the machine through the injector pump, the quantity and time of injection can be controlled through the programmer.

he material after dyeing is washed and finished properly in the same machine and taken out hydro extracted or pressure extracted in the same machine and dried subsequently.

Vertical Kier Dyeing Machines:

Knit Concern Ltd machines have a vertical cylindrical dyeing kier, in which material loaded into carriers with vertical perforated spindles, is dyed .The machine could be Fully flooded or air pad type .These are high pressure machines and suitable up to 135^0 C temperature dyeing.

Material to Liquor Ratio:

Material to liquor ratio is most important feature of the package dyeing machines, typically machines with M: L from 1:6 to 1:70 are commonly used KCL. However it is always preferred a machine with lowest possible liquor ratio, without affecting the quality of dyeing. The liquor ratio of the machines is reduced by reducing length the pipelines in the system, by modifying the carrier shape, by modifying and relocating the heat exchangers, air pad system and automatic liquor ratio adjustment, and using internal pumps.

3.12.10. Dozing System

It is essential for perfect dyeing results and reproducibility of results that addition of different chemicals, dyes, auxiliaries etc is done in a controlled manner and repeated exactly in a same manner always. The machine which run through programmers can be programmed in such a way those additions can be done in a specified time by following an incremental/progressive curve, a linear curve or a regressive curve etc.

3.12.11. **Dyeing Process**

Process for White Shade

Hot Wash 80^0c x 10’

↓

Drain

↓

Demineralizing agent + Acetic Acid > 50^0c x 20’

↓

Detergent + Sequester + DE aerating + Peroxide Stabilizer + Caustic > dosing 5’ > (50^oc X5’)

↓

Liquor return to preparation tank

↓

Brightener BHV

↓

Runtime 5 min at 60□c

↓

Peroxide dosing 5 min

↓

Runtime 20 min at 120□c

↓

Cooling

↓

Sample Check

□ Process follow-up:

YARN DYEING RECIPE: #1

SHADE : 55-006 (Pink)
YARN TYPE : 40 /1, COMB
M:L : 1:7

	Auxiliaries/Chemicals	Amount (g/L)	Amount (%)
P R E T	Demineralizati on		
	Sirrix 2UD (Sequestering)	1.0	-
	Acetic Acid	0.3	-
	Scouring & Bleac hing		
	Kappawet BOS (Detergent)	1.5	-
	Kappaquest FE (Sequestering)	0.5	-
R E A TM E N T	Parmagen NF (Deaerating)	0.2	-
	Kappazon H53 (Stabilizer)	1.0	-
	Caustic Soda	2.0	-
	H_2O_2 (50%)	3.0	-
	Hot wash with Peroxi de Killer		
	Chromalese PQ	0.3	-
	Neutralization after B leaching		
	Acetic Acid	0.5	-
	Dyeing		

DYE ING	Cibacell DBC (Levelling)	1.5	-
	Kappaquest FE (Sequestering)	0.5	-
	Parmagen NF (Deaerating)	0.25	-
	Imcozin Red E3BF	-	0.52716
	Imcozin Orange E2R	-	0.05344
	Imcozin Blue ENR	-	0.0057
	Glauber Salt	25	-
	Soda	15	-
AFTER TREATMENT	Neutralization after dyeing		
	Acetic Acid	1.0	-
	Soaping		
	Albatex AD (Washing off)	1.0	-
	Finishing		
	Permafix RD (Fixing)	-	0.5
	Tubingal 1112 (Softener)	-	1.5
	Oiling CT-200 (Softener)	-	1.5

YARN DYEING RECIPE #2

SHADE :Grass Green

YARN TYPE : 30 /1, COTTON

M:L :1:7

	Auxiliaries/Chemicals	Amount (g/L)	Amount (%)
PRE	Demineralizatio n		
	Sirrix 2UD (Sequestering)	1.0	-
	Acetic Acid	0.3	-
	Scouring & Bleaching		
TR	Kappawet BOS (Detergent)	1.5	-
	Kappaquest FE (Sequestering)	0.5	-

E A T M E N T	Parmagen NF (Deaerating)	0.2	-
	Kappazon H53 (Stabilizer)	1.0	-
	Caustic Soda	2.0	-
	H_2O_2 (50%)	3.0	-
	Hot wash with Peroxi de Killer		
	Chromalese PQ	0.3	-
	Neutralization after Bl eaching		
	Acetic Acid	0.5	-
D Y E I N G	Dyeing		
	Cibacell DBC (Levelling)	2.0	-
	Kappaquest FE (Sequestering)	0.5	-
	Parmagen NF (Deaerating)	0.25	-
	Synozol Yellow KHL	-	0.368
	Synozol Red KHL	-	0.0215
	Synozol Blue KRL	-	0.2419
	Glauber Salt	25	-
	Soda	15	-
A F T E R T R E A T M E N T	Neutralization after dyeing		
	Acetic Acid	1.0	-
	Soaping		
	Albatex AD (Washing off)	0.3	-
	Finishing		
	Permafix RD (Fixing)	-	0.5
	Tubingal 1112 (Softener)	-	1.5
	Oiling CT-200 (Softener)	-	1.5

YARN DYEING RECIPE #3
SHADE : 9UL Turquise
YARN TYPE : 24 /1, COMB
M:L :1:6.67

	Auxiliaries/Chemicals	Amount (g/L)	Amount (%)
	Demineralization		

PRE TREATMENT	Sirrix 2UD (Sequestering)	1.0	-
	Acetic Acid	0.3	-
	Scouring & Bleaching		
	Kappawet BOS (Detergent)	1.5	-
	Kappaquest FE (Sequestering)	0.5	-
	Parmagen NF (Deaerating)	0.2	-
	Polydye ST 1133 (Stabilizer)	1.0	-
	Caustic Soda	2.0	-
	H_2O_2 (50%)	3.0	-
	Hot wash with Peroxid e Killer		
	Chromalese PQ	0.3	-
	Neutralization after Bl eaching		
	Acetic Acid	0.5	-
DYEING	Dyeing		
	Cibacell DBC (Levelling)	2.0	-
	Kappaquest FE (Sequestering)	0.5	-
	Parmagen NF (Deaerating)	0.25	-
	Bezaktiv Yellow S3R	-	0.00288
	Bezaktiv Blue SLF	-	0.79
	Bezaktiv Turquise H-A	-	1.94
	Glauber Salt	60	-
	Soda	20	-
AFTERTREATMENT	Neutralization after dyeing		
	Acetic Acid	1.0	-
	Soaping		
	Albatex AD (Washing off)	1.0	-
	Finishing		
	Permafix RD (Fixing)	-	1.5
	Tubingal 1112 (Softener)	-	1.5
	Oiling CT-200 (Softener)	-	1.5

3.12.12. Hydro-Extractor

Hydro extraction is a very important process stage of drying process as for as the yarn quality and process cost is concerned. The main features desired from a good hydro extractor are-

To remove the maximum possible unbound moisture.

- The moisture should be evenly removed within a batch, i.e. all the packages have same moisture level%.
- Uniform removal of moisture from within a package.
- Minimum or no damage to the yarn quality, without deforming the shape of package.
- Minimum or no damage to the dye tubes, springs, cheeses and cones in long run. Low labor engagement
- Flexibility of the loading of different sizes and types of materials.

This machine is run to a maximum speed of 1400-1500 rpm and are available in fully or semi-automatic versions. The machines have a twin basket system, out of which one is under operation while other is ready for unloading and loading. Due to high speed of the basket the cycle time 5-6 min/cycle.

3.12.13.Rf Dryer

In RF driers the dielectric energy (electromagnetic) radiations are used for drying purposes. An RF drier has an electrically charged metal plate or electrode above the material, and another oppositely charged plate or electrode below the material to dry. The RF units switches the electrodes polarity at 27.12 MHz or (27.12 million times/second), whatever molecules being polar in nature try to align themselves with the electrode polarities and start oscillating with charge at the electrodes. The oscillation of the polar molecules (water molecules) thus generate internal heat due to this very high frequency oscillations and when a sufficient amount of energy is supplied ,the water is converted into steam which leaves the material and the product is dried.

3.12.14.Calculation

$$V = \frac{P \times 1.2}{M}$$

V= Conveyor speed in m/hr, P = Power available for use in kW,
And M = Moisture to
Be evaporated in kg from 1 meter Conveyor.

Let the dry of material is	= 100 kg
The weight of dyed hydro-extracted material	= 150 kg
The moisture content	= 50%
The final moisture to keep in material	= 5%
The moisture to evaporate in dryer	= 45%

Let there be a loading of 100 kg/m in the dryer

So water to be evaporated from 1 meter belt is 45 kg

$$\text{The belt Conveyor speed will be} = \frac{\text{KW of power of RF} \times 1.2}{\text{Water to be evaporated from1 meter}}$$

If the power input of the dryer is 130 kW,

The above calculation gives us a rough idea about the approximate speed; however the actual speed is finalized after actual trials on a particular quality of the yarn.

3.12.15.Hard Winding or Random Winding

Random soft package winding machines are conventional winding machines, in which a grooved drum acts as both the driving as well as the traversing element. The winding is done through indirect drive to the package, which we call the friction drive. The yarn lay formed is random, that's why is called random winding.
The main characteristics of random windings are-

Winding angle:-Since grooved drum is used for winding the winding angle remains the same.

Winding ratio:-The number of coils per turn of the package decreases as the diameter of the package increases, so the package is softer at the outer layers.

3.13. Utilities

Major Utilities Used In KCL Dyeing Are:

1. Water
2. Electricity
3. Steam
4. Compressed Air
5. Effluent treatment plant

3.13.1. WTP

Water Treatment Flow Chart:

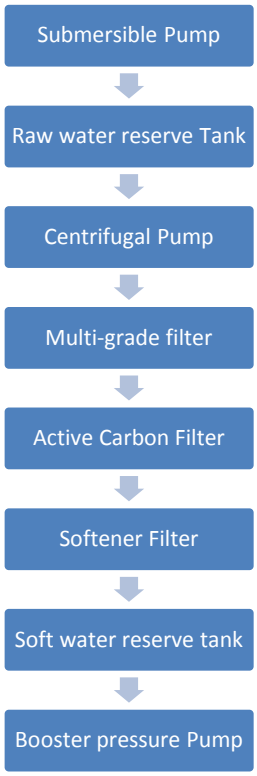
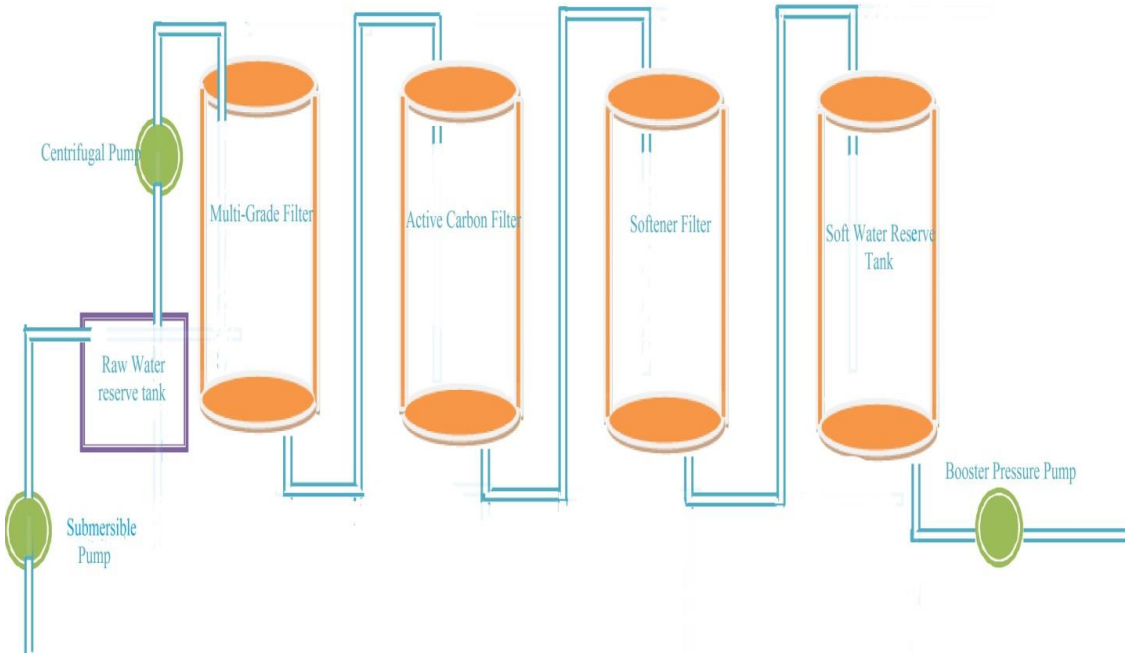


Diagram:



Parts of Water treatment system:

1. **Submersible Pump**:

   This Pump pulls water from underground.

2. **Raw water reserve Tank:**

   This tank reserves the raw water which was pulled out by Submersible Pump.

3. **Centrifugal Pump:**

   This Pump supplies the raw water from raw water reserve Tank to Multi-grade filter.

4. **Multi-grade filter:**

   This filter vessel consist:

Sand :4600kg

Gables :800kg

Pebbles-II :750kg

Pebbles-I :850kg

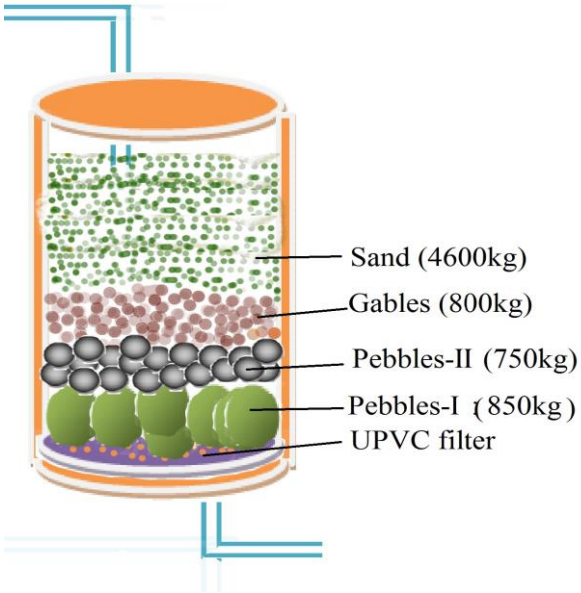


Fig: Multi-grade filter

5. Active Carbon Filter:

This filter vessel consist:

Carbon : 1200kg

Sand : 4600kg

Gables : 800kg

Pebbles-II : 750kg

Pebbles-I : 850kg

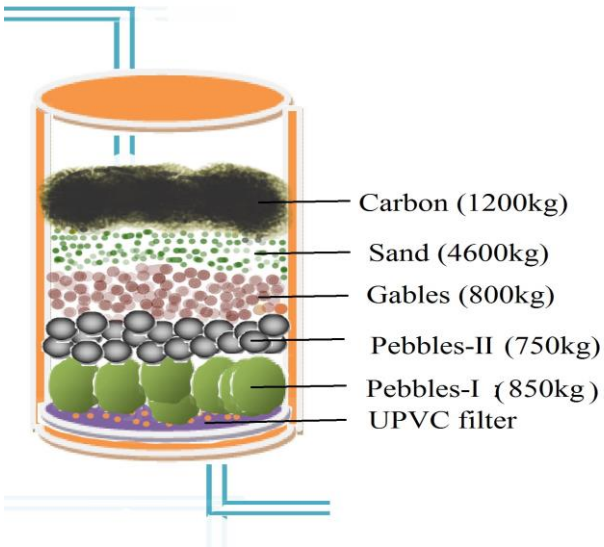


Fig: Active Carbon Filter

6. Softener Filter:

This filter vessel consist sand and 7000kg cat-ion resin.

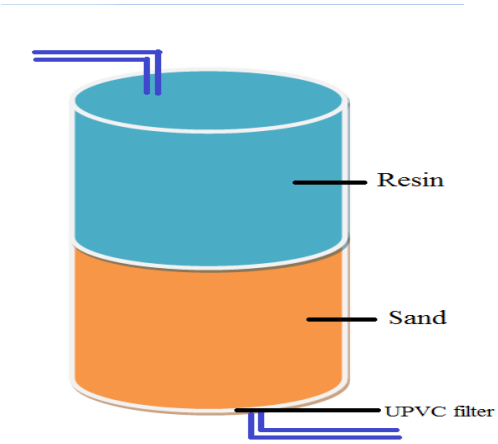


Fig: Softener Filter

7. **Soft water reserve tank:** This tank stores the soft water.

8. **Booster pressure Pump:** This Pump supplies the soft water from Soft water reserve tank to where needed with pressure.

Chemistry Involved:

Temporary hardness
$Ca(HCO_3)_2 + Na_2OZ = CaO.Z + 2NaHCO_3$
$Mg(HCO_3)_2 + Na_2OZ = MgO.Z + 2NaHCO3$

<u>Permanent hardness</u>
$CaSO4 + Na_2O.Z = CaO.Z + Na2SO4$
$MgSO4 + Na_2O.Z = MgO.Z + Na2SO4$

Where $Z = Al_2O3.SiO_2.H_2O$

In this tank after every 15 minutes around 3002kgs of salt is added to regenerate the resin by following reaction

$CaO.Z + 2NaCl = Na_2O.Z + CaCl_2$

Input & Output Quality of water:

Hour	Input water (PPM)	output water (PPM)
1st	350-400	0
2nd	350-400	0
3rd	350-400	0
4th	350-400	0
5th	350-400	5
6th	350-400	20
7th	350-400	45-50

3.13.2. Steam Boiler

Steam:

Steam is an important utility for dyeing section. Steam produced by the boiler Supply water is simply treated in the boiler section by the two softener tank Then water reserves to the feed water tank & this feed water tank warms the water then water passes to the boiler which produces steam & that steam supplies to the factory.

Main parts of the boiler:

Gas Chamber
Blower
Gauge glass
Safety valve
Burner

No of boiler	:	03
Type of boiler	:	Horizontal, Fire tube boiler
Brand	:	LOOS INTERNATIONAL (Germany)
Capacity	:	10 ton/hr
Fuel	:	Natural gas, Diesel.
Steam Consumption	:	2300 kg/hr for 1200-1500 products.
Steam pressure	:	7-8 bar
Water pressure	:	3-4 bar
Steam temp	:	180°-190°C
Boiler Temp	:	300°C
Chemical Used	:	For anticipant ,Tandex SD 15 Tandex BWS Tandex BWT
Feed water Quality	:	pH – 7-8

TDS – 430-530
Hardness - <2 ppm

Power Consumption : 40

3.13.3. Electricity/Generator

Total Generator: 4
Types : Diesel Generator – CAT (USA) – capacity – 1710 KW
Gas Generator – WAVKESHA – Capacity – 1100 KW (2) & 900 KW

- Total Requirement – 2-2.5 MW/day (3500-4000 kAmp current)
- Total Output of Three Gas generators – 2100-2500 kw
- Pressure required for Gas generators – 222 kpa for 1100 kW & 145 kpa for 900 kw.
- Line Pressure – 13 to max 145 kpa

3.13.4. Compressed Air/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 vapours are condensed & outlets drop by drop.
The moist compressed air is transferred to the dryer& a slight warm compressed air is delivered to require sections of KCL.

Source: Natural Air
M/C Name: Compressor
Brand: BOGGE (Germany)
CECATTO (ITALY)
No of m/c: 04
Capacity: 27, 0001/hr., 1800 1/hr.
Unloading pressure: 7.2 bar
Loading pressure: 5.6 bar
Chemical Used: Grease, Oil AMERI

3.13.5. ETP

Effluent Treatment Plant

- Type Of Plant – Biological
- Approximate Area – 20 katha
- Set up completed by Italian Technology

Project Description:

Tank/Unit Function

Screen Brush - Big particle & materials remover.

Lifting Pump Unit -Automatic flow lifter with level censored pumps.

Storage & Homogenizing Tank –

1. mixing by air circulation
2. reduce temperature
3. convert dissolved particles into
4. suspension
5. Storing for 24 hrs.
6. pH 11-12

Neutralization tank - to neutralize the alkalinity by
-dozing Sulphuric acid (98%)
-pH 7-9

Distributor tank - Passes & store the neutralized effluent water.
-Sludge return

Biological & Oxidation Tank –

- ✓ Different types of microorganisms are cultured.
- ✓ Sustentation of effluents
- ✓ Destroy toxic chemicals
- ✓ Separate organic, inorganic &
- ✓ synthesized particles
- ✓ Dye particles are eaten by microorganisms
- ✓ pH 7-8.5

Sedimentation feeding tank

Decolration of existing color particles & feed to sedimentation curve.

Sedimentation Curve

Three section-

- -separator
- -clarifier
- -scrapping bridge

Chemical Used In Different Section:

- Antifoam - Biological tank
- DE colorant - Sedimentation feeding tank.
- Nutrient Salt(Urea & TSP) - Biological Tank
- Polyelectrolyte - Sludge Thickener
- Sulphuric acid - Neutralization tank
- Na(OCl)Cl - Biological tank

Function of Different Chemicals

- 98% H2S04 – Neutralize the water by controlling pH
  It is auto dispensed in the neutralization tank.
- Polyelectrolyte - Used for sedimentation/sludge coagulation
  It is used auto/manually in sludge thickener tank.
- DE colorant - Used for removing color.
  It is used auto/manually in sludge thickener tank.
- Anti-foaming agent - Used for reducing/controlling foam.
  It is used auto/manually in the oxidation tank.
- Sodium hypochlorite -It is used to killing harmful bacteria/insect.
  It is used in the Biological Oxidation tank.
- Nutrients -when bacteria become weak it is added to a certain quantity
  It is added in the oxidation tank.

Standard Testing Parameters:

Parameter	Govt. Tolerance (ppm)	Inlet (before etp) (ppm)	Outlet (ppm)
BOD	50	281	23
COD	200	356	200
TDS	2100	3200	1580
TSS	150	204	36
ELECTRIC CONDUCTIVITY	1200	6430	3160
DO	4.5-8	0.1	4.6
CHLORIDE	600	-	>200
PHOSPHATE	8	2.6	2.2
NITRITE	50	0.8	0.5
pH	6-9	10.3	8.1
Temp.	40-45	50	35

3.14. Marketing

Marketing plays a vital role in the field of displaying/showing the good criteria of the products to the buyer & to communicate with the buyer .there about 30 people in the marketing section of the industry.

Marketing Strategy:

Marketing strategy is a very important factors to sale the products to the buyers If the marketing strategy Is not so developed it will be very hard to reach the goal In case of garments marketing the dealings with the buyer is a very important factor.

Mainly senior marketing officers, merchandisers & higher officials deal with the buyer there are some fixed buyers of the industry. The buyers give their orders continuously all over the year. The Marketing officers & by both side understanding the rate & the order quantity are fixed.

Duties & Responsibilities Of Marketing Officer:

Dealing with the buyer & convince the buyer is the main duty of the marketing officer. A marketing officer has some also other duties the main duties & responsibilities of a marketing officer are given below:

- To prepare cost sheet by dealing with buyer.
- To take different steps by discussing with the high officials & merchandisers.

To maintain a regular & good relationship between commercial officers & merchandisers.

- To maintain a regular communication with the buyers & buying houses.
- Communicate with the new buyers.
- Display the better criteria of the products.

Actually the responsibilities & duties of marketing officer begins from getting order of buyer. Ends after receiving goods by the buyer so he should be always smart energetic & sincere.

Importing Countries:

KNIT CONCERN *LTD.* is a 100% export oriented industry. All the goods produce in this industry are exported to various country.

- Europe Countries like UK France Germany etc.
- U.S.A.
- Japan

Product Label:

Product label differs from fabric to fabric. The product labels are prepared according to the quality & the buyer requirements.

Local Market:

KNIT CONCERN LTD is a 100% export oriented industry. All the goods produced in this industry are exported into various foreign countries. So goods are not supplied into local market.

Marketing Strategy:

Marketing strategy is a very important factors to sale the products to the buyer. If the marketing strategy is not so developed, it will be very hard to reach the goal. In case of garments marketing the dealings with the buyer is a very important factor.

In KNIT CONCERN LTD. Mainly senior marketing officers, merchandiser & higher officials deal with the buyer. There are some fixed buyers of the industry. The buyers give their orders continuously all over the year. The marketing officers & the merchandisers communicate with the buying houses to collect the orders.
By both side understanding the rate & the order quantity are fixed.

Buyer:
KCL is 100 % export oriented industry. All the goods produced in this industry are exported into various foreign countries. Name of the main buyers of this mill are given below:

- H&M
- OKAIIDI
- CAMAIEU
- CARREFOUR
- JULES
- DECATHLON
- SPRIT
- QUICK SILVER
- BIZBEE
- KNIT LINE
- S.OLIVER
- AMS INTERNATIONAL
- RIPCURL
- BETTER BARCLAY

REMARKS:

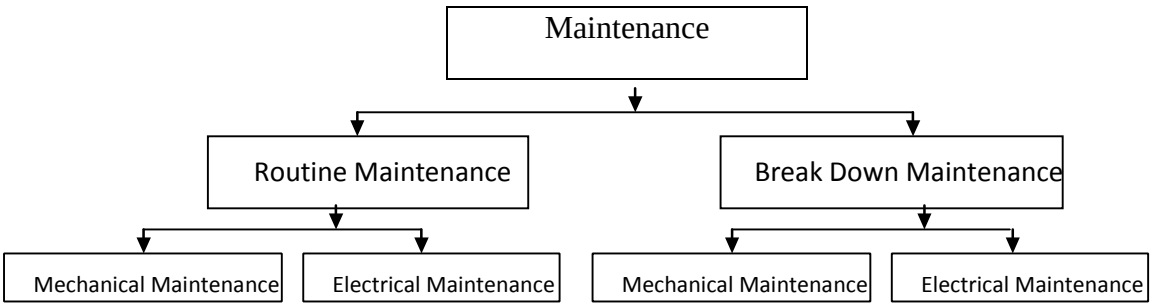
KCL has a well learned marketing & merchandising team. They always communicate with the buyers
KCL has some fixed buyers the marketing section also looks for the quality & quantity of buyers

3.15. Maintenance

Maintenance of machinery is very essential mechanical effort for achieving smooth running of different machines. Maintenance is a process by which equipment is looked after in such a way that trouble free services and increased machine life can be ensured and specific product quality required by the customers is sustained. On time maintenance increase m/c lifetime & ensures trouble free services.

2 types of maintenance are done:

1. Break down maintenance
2. Routine maintenance



1.Break down maintenance: Break down maintenance is done instantly when problem arises in machine. In this case, repairs are made after the equipment is out of order and it cannot perform its normal functions.

2.Routine maintenance: After a particular period of operation, the machines are cleaned & reordered, that is routine or schedule maintenance. The maintenance department does it once in a month. Schedule maintenance varies, time in time & also depends on situation according to types of machines, because maintenance is directly related to production. Most of the time, all the screws, nuts, bolts & levers are checked, lubrication is also done. Workers inform about the problem areas of the machines. Depending on their information maintenance is done. Maintenance engineer analyze the records and take steps according to requirement.

Routine: Maintenance is a necessary task in any industry. But the degree and interval of maintenance is dependent upon the age of the machineries. Landmark Textile Mills Ltd. has relatively new machineries, which are very modern and state-of-the-art. Due to this reason a relatively less amount of maintenance is needed to be carried out in Landmark Textile Mills Ltd. Never-the-less, routine maintenance of the machineries of the dyeing section is carried out once a week. As the dyeing section remains closed in Friday, the routine maintenance is carried out in Friday. As for break down maintenance (very few break down cases occur), proper steps are taken to rectify the problem.

Manpower Setup For Maintenance:

Post	Number of Employees
Mechanical Engineer	1
Electrical Engineer	2
Mechanical Fitter	1
Electrical Supervisor	1
Asst. Mechanic	2
Electrician	1
Asst. Electrician	2

Maintenance Procedure:

Maintenance: Mechanical
Machine: Dyeing Machines

Sl. No.	Item needed to be checked & Serviced
1.	Greasing of the winch bearing
2.	Complete cleaning of machine
3.	Cleaning of drain valves, replace seals if required
4.	Checking of air supply filter, regulators, and auto drain seals
5.	Cleaning of filter elements
6.	Greasing of unloading roller bearings
7.	Checking and cleaning (if required) of addition tank level indicator
8.	Checking the oil level of pump bearing and refill if required
9.	Checking the function of heat and cool modulating valves
10.	Checking of all belts and belt tension
11.	Check circulation, reel and other pumps

12.	Checking of all door seals

Maintenance: Mechanical
Machine: Stenter Machine

Sl. No.	Item needed to be checked & Serviced
1.	Removal of gas burnt deposits from chains
2.	Checking of gas burners
3.	Cleaning of softener application unit
5.	Checking and cleaning of steam pipe lines
4.	Checking and cleaning of gas pipe lines
5.	Grinding of fabric gripping pins
6.	Cleaning of ventilation duct
7.	Cleaning of m/c cabinet
8.	Checking of motors

Maintenance: Mechanical
Machine: Dewatering Machine

Sl. No.	Item needed to be checked & Serviced
1.	Cleaning of softener application unit
2.	Checking of rotating device of rotating trolley unit
3.	Checking of pneumatic pressure valves
4.	Checking and replacement (if necessary) of rubber pads of stretching unit
5.	Checking of plaiting device
6.	Checking of speed regulating unit

Maintenance: Mechanical
Machine: Tensionless Dryer

Sl. No.	Item needed to be checked & Serviced
1.	Checking of gas pipe lines
2.	Checking of gas burners
3.	Checking of belt conveyor system
4.	Checking of plaiting device
5.	Checking of speed regulating unit
6.	Cleaning of ventilation duct
7.	Cleaning of m/c cabinet

Maintenance: Mechanical
Machine: Compactor Machine

Sl. No.	Item needed to be checked & Serviced
1.	Checking of Steam pipe lines
2.	Checking of pneumatic pressure valves
3.	Checking of belt conveyor system
4.	Checking of plaiting device
5.	Checking of speed regulating unit
6.	Checking and replacement (if necessary) of compacting shoe
7.	Cleaning of compacting shoe

Maintenance: Mechanical
Machine: Raising Machine

Sl. No.	Item needed to be checked & Serviced
1.	Checking of Gearing system and replacement of faulty gears

2.	Cleaning of fiber deposits from the pile and counter pile rollers
3.	Grinding of pins of pile and counter pile rollers
4.	Lubrication of gearing system

Maintenance: Mechanical

Machine: Boiler

Sl. No.	Item needed to be checked & Serviced
1.	Checking of gas pressure and gas supply line
2.	Dosing of softening chemicals to supply water
3.	Checking of all steam lines
4.	Cleaning of burner tank (after six month interval)
5.	Checking and replacement of valves
6.	Cleaning of feed water tank
7.	Checking and replacement of filters
8.	Cleaning of sight glass

Maintenance: Electrical

SL NO.	Items needs to be checked & serviced
1	Check main panels
2	Check panel cooling fan & clean its filter
3	Clean main pump inverter & its cooling fan
4	Check all circuit breaker ,magnetic conductors & relays
5	Check current setting of all circuit breaker & motor over load
6	Visual checking of all power & control cables

7	Check ail motor's terminals
8	Check & clean fluff & dirt at all motor fan covers
9	Check DC drive of kneel motors
10	Check all pressure switches
11	Check calibration of main vessel & all addition tank
12	Check all signal isolators
13	Check setting & operation of lid safely switches
14	Check setting of tangle sensors
15	Check all pneumatic solenoids
16	Check all indicating lamps
17	Check calibration of heating/ cooling modulating valve
18	Check all on/off switches

Maintenance Tools And Equipment:

Sl. No.	Maintenance tools/equipment's	Functions
1.	Adjustable wrench	Used for setting nut & bolts
2.	Pipe Spanner	For pipe fitting
3.	Spanner	Fixed Spanner for nut & bolts fitting
4.	Socket spanner	Handle system for nut & bolt fitting
5.	Hammer	To apply load where required
6.	Screw driver	To release any screw
7.	Punch	Used to fit any worn out shaft
8.	Lock opener	To open the clip of bearing
9.	Hack saw	To cut any metallic thing
10.	Outside calipers	To measure outside dia
11.	Inside calipers	To measure inside dia
12.	Slide calipers	To measure very small dia
13.	Vernier scale	To measure very small dia
14.	Chain ton	To lift heavy load
15.	Welding machine	To join metallic parts
16.	Grinding machine	To make the smooth fabrics
17.	Tester	To test electric circuit
18.	Pliers	To grip anything & cut anything
19.	Avometer/Voltmeter	To measure voltage
20.	Steel tape	To measure length, width & height

21.	Chisel	To cut any metal
22.	File	To smooth the rough surface

Maintenance Schedule

Serial No.	Parts Description	Check Time
1	All pumps(bearing,coupling)	3 month
2	All belts (loose/tight)	monthly
3	All bearing(grease/sound)	monthly
4	All gear box(oil/sound)	monthly
5	All valves leak	monthly
6	Reel rubber	monthly
7	Mechanical seal	monthly
8	Steam trap	monthly
9	Handle of lid	monthly
10	LID opening stopper	monthly
11	LID glass	monthly
12	Safety valve(main kier&heat exchanger)	monthly
13	Pressure gauge	weekly / monthly
14	Water leveling scale	monthly

CHAPTER 04

CONCLUSION

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CONCLUSION

We have completed our industrial attachment successfully by the grace of Almighty Allah. Industrial attachment will give us our expected destiny of practical life .By the completion of two months of Industrial attachment at KNIT CONCERN LIMITED, we have got the impression that the factory is one of the most modern export oriented knit composite in Bangladesh. Though it was established only a few years ago, it has earned “very good reputations "for its best performance over many other export oriented textile.

Mill is settled with utility to give all convenient supports to the productions for twenty-four-hour. KCL has its own water pre-treatment plant & 26,300 cubic feet water reservoirs in its Godnail campus .The Godnail premises has its own power generation plant where 1,900 kW power generators guarantee smooth & uninterrupted power supply to its every operation.

Last of all we again give grade thanks to GOD for successfully completed our industrial attachment. Actually, Knit Concern Group is a 100% export oriented knit composite industry. During the training period we have completed our industrial attachment to a systematic routine which was provided by Knit Concern Group .We get help from different sections officers and workers which was helpful to gain very good practical knowledge. Sometimes we operate machine for various jobs during operation. Last of all we thank all the officers and workers who helped us by co-operating and giving reliable information to us.

CHAPTER 05

IMPACT OF INTERNSHIP

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IMPACT OF INTERNSHIP

We have seen different type circular and flatbed knitting machines. We have got idea about the needle and cam arrangement. Learned about different types of fabric design. We have learnt different types of calculation such as GSM calculation. Relation among yarn count, GSM and stitch length of different types of fabric introduced during internship. Different type fabric faults and their remedies. We have been introduced with different types of machine faults and their remedies. We saw machines set up.

We have got idea about different types of dying process. Different types of dyeing fault and remedies. Functions of different types of chemicals used in dying. Different types of dies such as reactive dye, disperse dye and acid dye. We have seen different types of fabric fault and remedies. We have gather knowledge about different machines used in wet processing.

Different types of yarn dyeing machine. Objects of soft and hard winding. Package density calculation. We introduced different types yarn dyeing process. We have learnt about soft and hard winding. We learnt about different types of chemicals and their functions. Different types of yarn dyeing faults and their remedies. Different types of yarn dyeing machine faults and their remedies.

We are lucky to know about yarn printing as it is single most section ever Bangladesh. The process of yarn printing. Chemicals used in yarn printing and their functions. Design created by yarn printing. Application of printed yarn.

We have learnt about different yarn dyeing, knit dyeing tests. Different types of physical tests machines. Testing procedure and their o

- Objectives of testing.