



Industrial Training Report

Course Code: TE 410

At



Biswas Group Ltd.

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Letter of Transmittal

Date: August 29, 2013.

To

Prof. Dr. Md. Mahbubul Haque

Head, Department of Textile Engineering, FSIT

Daffodil International University.

Subject: Letter Regarding Submission of Internship Report on Comparative Study on “Textile Engineering” Study at “Biswas Group Ltd”.

Dear Sir,

With due to respect, it is my pleasure to submit this report entitled “Comparative study on textile study at Biswas Group Ltd.” This was assigned to me a requirement for the B.Sc. in Textile Engineering program.

I have prepared this report based on my (02) two month’s works in “Biswas Group Ltd.” I have tried to my best to make a enrich report and now I am glad to submit you this for better judgment. I shall be cheerful if this report serve the purpose of my dissertation. However, I am ready to explain anything to you if feel necessary.

I would be very grateful if you kindly accept the report and evaluate property.

Yours truly,

Ribon Kumar Biswas

ID: 091-23-1426

Acknowledgement

At the very beginning we acknowledge the infinite blessing & profound kindness of "**Almighty GOD**" that we have completed our thesis successfully.

Md. Mahfuzur Rahman, Assistant Professor, Department of Textile Engineering, Daffodil International University, my supervisor, to whom I am extremely grateful for his tremendous support & guidance throughout my internee.

Being working with him I have not only earned valuable knowledge but was also inspired by his innovativeness which helped to enrich my experience to a greater extent. His ideas & way of working was truly remarkable. I believe this internee report could not be finished if he did not help me continuously.

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Introduction

The tremendous success of readymade garment exports from Bangladesh over the last two decades has surpassed the most optimistic expectations. Today the apparel export sector is a multi-billion-dollar manufacturing and export industry in the country. The overall impact of the readymade garment exports is certainly one of the most significant social and economic developments in contemporary Bangladesh. With over one and a half million women workers employed in semi-skilled and skilled jobs producing clothing for exports, the development of the apparel export industry has had far-reaching implications for the society and economy of Bangladesh.

Textile education can't be completed without industrial training. Because this industrial training minimizes the gap between theoretical and practical knowledge and make us accustomed to industrial environment. I got an opportunity to complete two month (8 Weeks) long industrial training in "**Biswas Group Ltd.**" which is a 100% export, oriented composite Textile Industry. It has well planned & equipped fabric and dyeing-finishing, garments units in addition to facilitate Knit and Woven wear manufacturing.

The industrial internship is the process, which builds understanding, skills and attitude of the performer, which improves his knowledge in boosting productivity and services. University education provides us vast theoretical knowledge as well as more practical attachment, in despite of all these industrial attachment helps us to be familiar with technical support of modern machinery, skill ness about various processing stages.

It also provides us sufficient practical knowledge about production management, work study, efficiency, industrial management, purchasing, utility and maintenance of machinery and their operation techniques etc. The above mentioned cannot be achieved successfully by means of theoretical knowledge only. This is why it should be accomplished with practical knowledge in which it is based on. Industrial attachment makes us reliable to be accustomed with the industrial atmosphere and improve courage and inspiration to take self responsibility.

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1.1 Biswas Group Ltd.

Biswas Group was established in 1985. Biswas Group deals in Apparels, Textiles' & Accessories. It is a 100% export oriented Composite Factory. Biswas Group is designed and equipped with most modern machineries in Knitting, Dyeing, Garments, Washing and Dry Finishing Division also strictly maintains the International Compliance Standards prescribed by various World known Certification Authorities. They have a team of dedicated, experienced professionals taking care of every division to meet the requirements of our valued clients along with skilled primary work force which made It exclusively a "Buyer Friendly" company.

Production Capacity:

Products	Unit	Qty/Day	Qty/Year
1) Woven - Polyester Based Micro Fabrics, Nylon Taffeta Polyester taffeta, Printed Fabrics	Meter	50000	15000000
2) Knitted Fabrics Polar Fleece, Valor, Safra Cotton Fleece, Printed Fabrics	Kg	25000	7500000
3) Tri-Coat	Meter	3000	900000
4) Woven - Cotton fabrics	Meter	3000	9000000

Monthly Capacities:

430,000 pcs woven bottoms, 300,000 pcs woven tops, 380,000 pcs pants, 600,000 pcs knit tops, 300,000 pcs knit bottoms.

Product Range

Men's, Women's, Boys, Girls , Kids and Toddlers-Shirts, Polo Shirts, Woven Women's Blouses, Men's Shirts, Pants/Shorts Casual/Denim Men's, Women's and Kids ,Jogging Suits, Swimwear, Nightwear, and Winter wear.

1.2 Mission of Biswas Group:

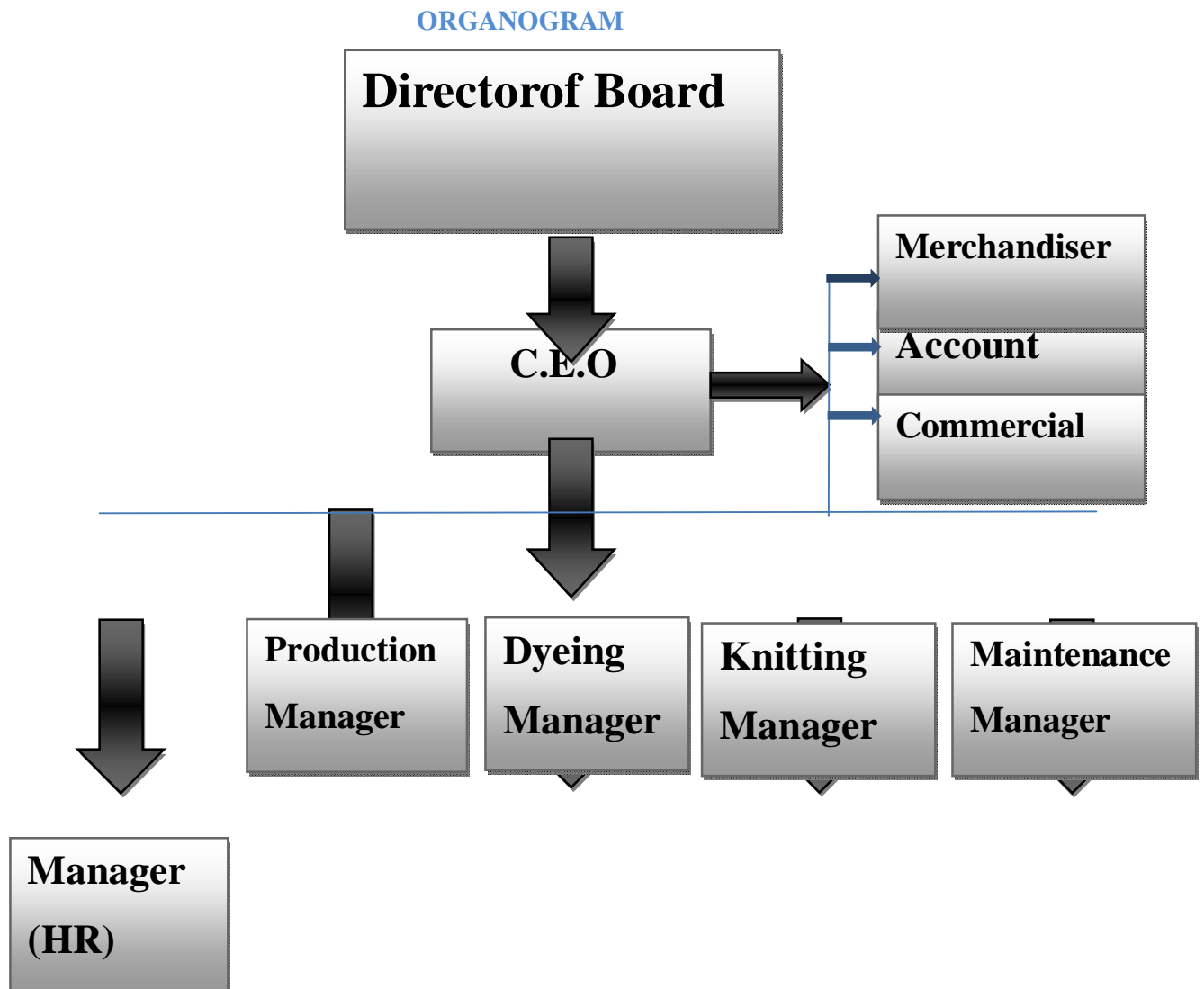
To present quality products to customers and explore new markets to promote or expand sales of the company through good governance and foster a sound and dynamic team, so as to achieve optimum prices of products of the company for sustainable and equitable growth and prosperity of the company.

1.3 Vision of Biswas Group:

Biswas group is one of the largest exporters of garments in Bangladesh to the USA and European markets, They pride themselves by building strategic alliances with their customers to better understand their needs and requirements, They are constantly changing to the demands of a moving market place and always doing research and development to offer the newest innovative products, They distinguish themselves not only by our high quality and on-time delivery, but also with their market research, creative designs and customer service.

1.4 Company Shareholder:

SI No.	Name	Designation	Share %
01	Mr. Md. Moinuddin Biswas	Chairman	70%
02	Mrs. Mahamuda Moin	Director	20%
03	Mr. Md. Meheran Biswas	Shareholder	10%



1.5 Employees, Machine, Customer List & Achievements:

Object	Qty
Work force	9000 employees
Sewing Lines	100
Sewing Machines	4567
Knitting Machines	220
Weaving Machines	300
Dying Machines	47

Customer List :

Name	Country
• Aldi	Germany
• C & A	UK
• Zara	Spain
• Calvin Klein	USA
• Carrera	Italy
• H & M	Sweden
• Tema	Turkey
• Wal- Mart	Europe
• JC Penney	USA
• Ecko	USA
• Defacto	Turkey
• Inditex	Spain
• Hurley	USA
• Lidl	Germany
• Oshkos –USA	USA
• Sol's	France
• Roca Wear	USA
• Sears/K-Mart	USA
• Kik	Germany
• Kenneth Cole	USA
• LC Waikiki	Turkey/France

Achievements:

- ❖ Best Export Performance Award from Prime Minister of Bangladesh.
- ❖ 2004 best supplier of New Wave.
- ❖ Appreciation Award for Sponsoring Biswas Friendship Tennis & Squash from Prime Minister.
- ❖ Batexpo Bangladesh Apparel Fabric & Accessories Exposition organized by BGMEA.
- ❖ Commercial important person” title given by the government of Bangladesh.
- ❖ Ex Director of Bangladesh garment manufacturer and exporters association.

1.6 Contact Information:

Corporate Head Office:

J.S. Bhaban, 95, Bir Uttam C.R. Dutta Road (New) 299/2A Sonargaon Road (Old),
Dhanmondi, Dhaka-1205, Bangladesh

TEL: 9668835-7, 8611796, 8610685, 9673065

FAX: 88028613367

Email: babu@biswasgroup.com

Web: www.biswasgroup.com

Factory Address:

Rajfulbaria, Saver, Dhaka

Fabrics Inquiry _____:

Mobile: 8801713479049, 8801713148784, 8801713423146

Email: tuhin_bfl@biswasgroup.com; biplob@biswasgroup.com

Zipper Inquiry _____:

Mobile: 8801713479129

Email : khurshid@biswasgroup.com

Accessories Inquiry:

Mobile: 8801678021700

Email: khurshid@biswasgroup.com

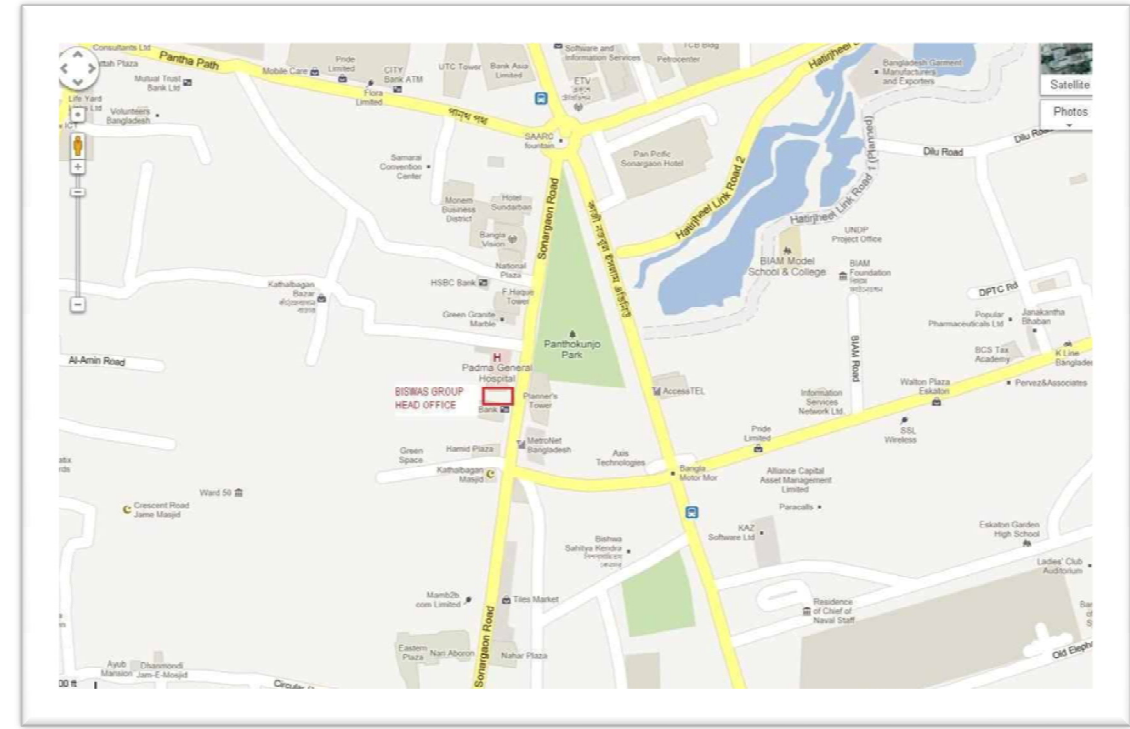
Apparel Inquiry _____:

Mobile: 8801713423115, 8801713423113, 8801713423118

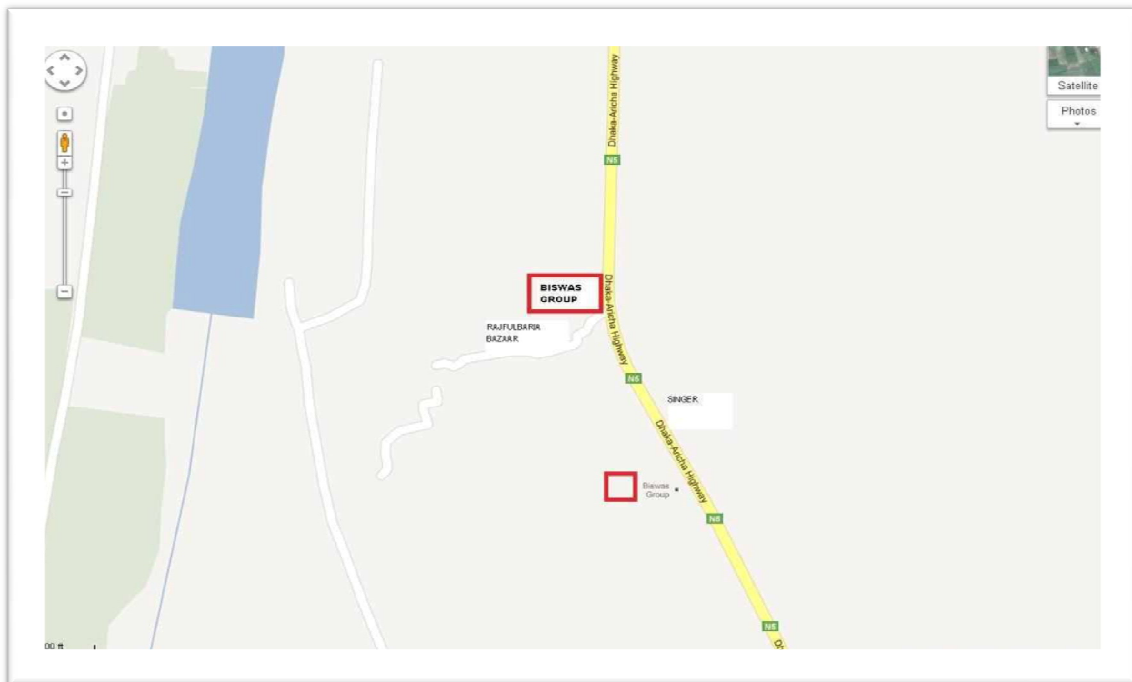
Email: hasan@biswasgroup.com;

shahjahan@biswasgroup.com;

samad@biswasgroup.com



Location Map of Corporate Head Office



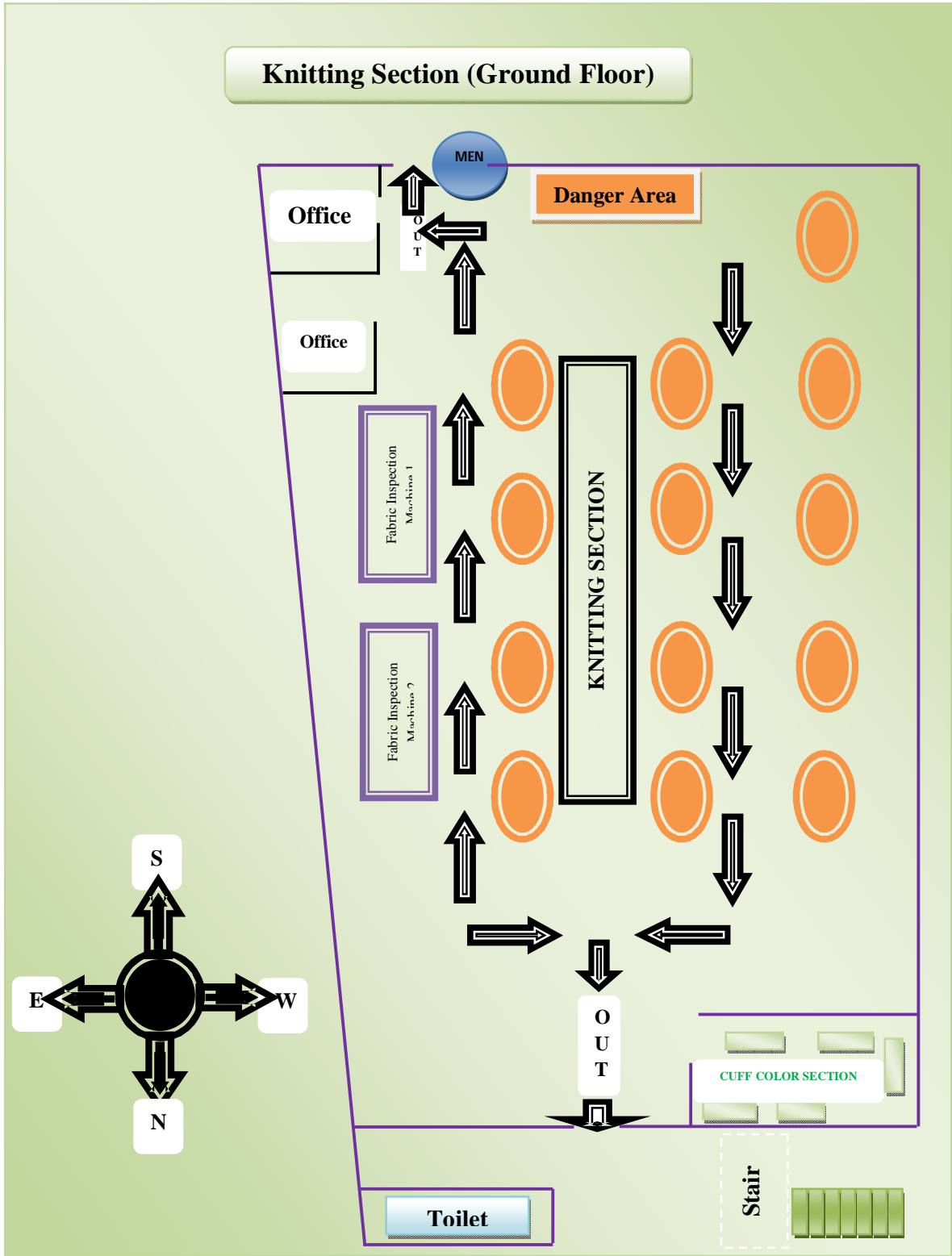
Factory Location Map Biswas Group

CHAPTER: 2

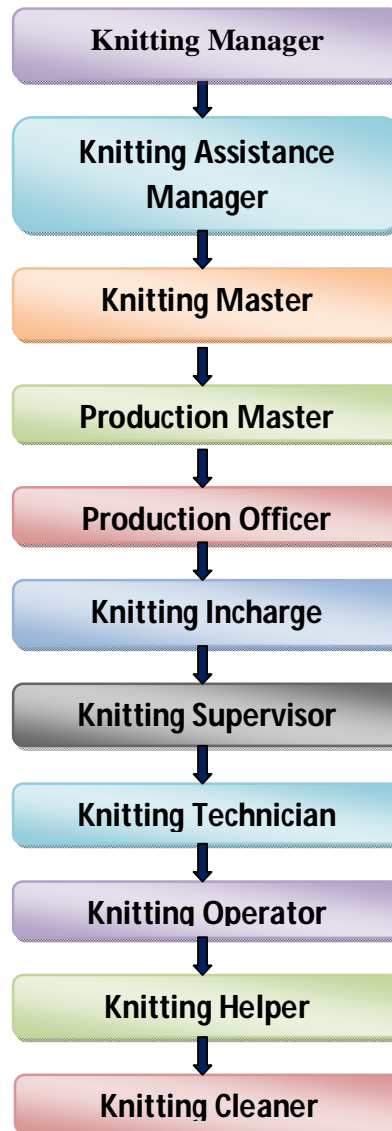


Knitting Section

2.1 Lavout of knitting floor



Organogram



2.2 Yarns:

Yarns are the most important part of a Textile industry. Yarn is a generic term for a continuous strand of textile fibers, filaments or material in a form suitable for knitting, weaving or otherwise intertwining to form a textile fabric. Yarn occurs in the following forms:

- Number of fibers twisted together.
- Number of filaments lay together without twist.
- Number of filaments lay together with a degree of twist.
- Single filament with or without twist.
- A narrow strip of material.

2.2.1 Counts of Yarns Used:

Count is an important parameter for the manufacture and processing of fabrics as it indicates the fineness of the yarn. Finer or more count yarns produce finer fabrics and coarser or less count yarns produce coarser fabrics.

Normally the counts of yarns used in the DIVINE Knitting section are given below:

Cotton: 20/1, 24/1, 26/1, 28/1, 30/1, 34/1, 40/1 Ne

PC: 20/1, 26/1, 28/1, 30/1 Ne

CVC: 26/1, 30/1, 34/1 Ne

Mélange: 20/1, 22/1, 26/1, 30/1 Ne

Spandex: 40D, 70D

Polyester: 75D, 150D

Sewing thread: 40/2, 150D etc.

2.2.2 Yarn LOT(Specification Card):

<p>YARN COUNT- 30/CARD SUPPLY-PSML LOT- 04/10 QUANTITY- 4650.0 KG YARN COUNT- 34/C. SLUB SUPPLY-PSML LOT-61/10</p> <p>Quantity-1200.0 Kg</p>
--

2.2.3 Types of yarns used in PURBANI:

There are various types of yarns used in PURBANI FABRICS LIMITED knitting section which is discussed below:

- Carded Cotton Yarn.
- Combed Cotton Yarn.
- Slub Cotton Yarn.
- 50% Cotton & 50% Modal Yarn.
- Grey Mélange.
- Lycra/Elastane/Spandex Yarn.
- CVC (60% Cotton & 40% Polyester) Yarn.
- Polyester Yarn.
- Cotton Mélange.
- Various Cotton Dyed Yarn.
- PC (60% Polyester & 40% Cotton) Yarn.
- Viscose Yarn.
- Carded Slub Yarn.

2.3 Characteristics of various types of Yarn:

There are various types of yarns which are formed of various types of fibers and demonstrate various properties. The varieties of yarns used in PURBANI are discussed below:

Carded Yarn:

A fibrous cotton yarn or cotton blend yarn made of short staple cotton fiber from which most of the impurities have been removed by various processes of carding and drawing.

Combed Yarn:

A fibrous cotton yarn which is combed and the fibers are long with small diameter is called Combed Yarn.

Slub Cotton Yarn:

The cotton yarn which contains irregularity of thick and thin places in the yarn in continuous bases is termed as Slub Cotton Yarn.

50% Cotton & 50% Modal Yarn: The yarn which is a mixture of 50% cotton fiber and 50% Modal fiber is termed as 50% Cotton & 50% Modal Yarn. Modal is mainly an artificial fiber which has a similar appearance to silk

Grey Mélange: The yarn which is a mixture of maximum 15% viscose fiber and 85% cotton fiber is known as Grey Mélange yarn.

Lycra/ Elastane/ Spandex yarn:

A yarn which shows elastic properties and which is formed of polyurethane/ polyamide fibers is known as Elastane/Lycra/Spandex yarn.

CVC yarn:

CVC yarn is a yarn which means Chief Value Cotton and consists of 55% /60% /65% of cotton fiber and 45%/ 40%/ 35% of polyester fiber.

Polyester Yarn:

Such type of yarn which is made from polymers produced from melt spinning of ethylene glycol and teriphthelic acid.

Cotton Mélange:

A yarn which consists of 15% black dyed yarn and 85% of grey cotton yarn and spanned to form a yarn is called Cotton mélange.

Viscose Yarn:

Such type of yarn which is formed of spinning of viscose rayon fiber is called Viscose Yarn.

PC (60% Polyester & 40% Cotton) Yarn:

Such yarns which are formed by blending 60% polyester fiber and 40% cotton fiber through various processes. It is also known as Anthra Mélange

2.4 Types of raw material

- ✓ Yarn: Carded Yarn
- ✓ Combed Yarn
- ✓ Cotton Modal
- ✓ Cotton + Viscose
- ✓ Cotton Yarn Cone
- ✓ Spun Yarn: 100% Polyester
- ✓ Lycra

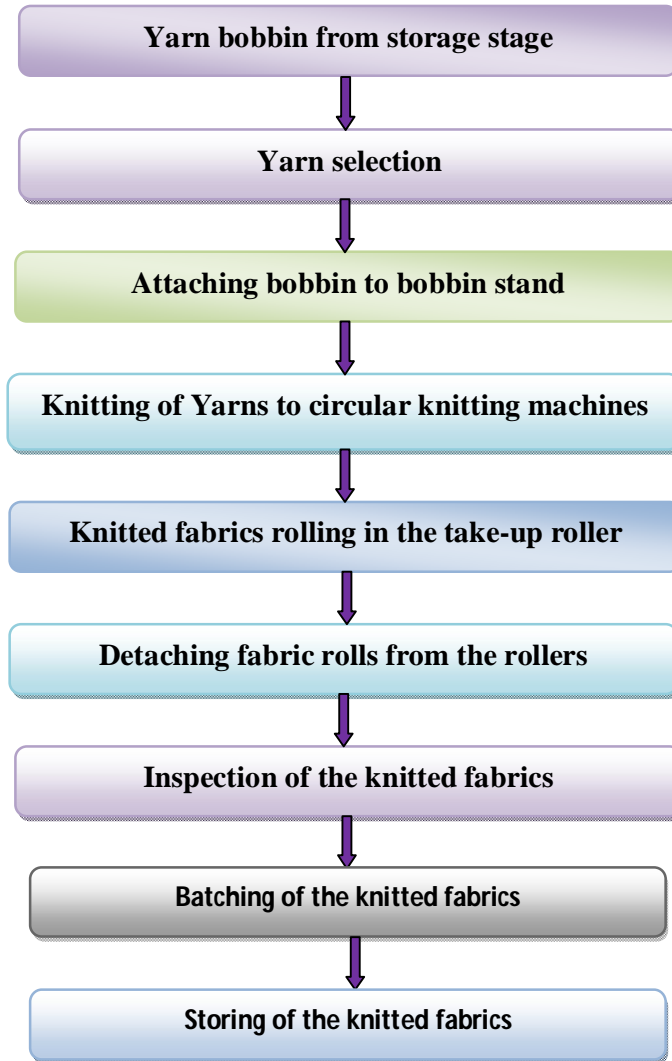
2.5 Source of yarn for knitting:

Serial No	Name of the spinning Mills
1	Karim Spinning Mills ltd.
2	Square Yarns ltd.
3	Badsha Textiles ltd.
4	Shamsuddin Spinning Mills ltd.
5	CRC Textile Mills ltd.
6	Syed Spinning and Cotton Mills ltd.
7	Amber Cotton Mills ltd.
8	Keya Spinning Mills ltd.
9	M.S.M.L
10	Rising Spinning Mills ltd.
11	Karim Spinning Mills ltd.

2.6 Fabrics Produced in Purbani Fabrics Ltd:

- Single Jersey.
- Single Lacost.
- Double Lacost.
- Double Pk.
- Heavy Jersey.
- Rib Fabrics.(1/1, 2/1)
- Lycra rib (1/1, 2/1)
- Plain Interlock.
- Single Jersey full feeder lycra.
- Single Jersey half feeder lycra.
- Single lacust half feeder lycra.
- Teri fabrics.
- Flat knit collar.
- Fleece fabric.
- Cos Fleece.
- Birds eye.
- Mini eye let.
- Eye let.
- Interlock Pk.
- Wofelet.

2.7 Flow process of knitting section:



2.8 Flat Knitting Section: Generally collar and cuff of knitted garments is produced in this section there are flat knitting machines of the same type. There specifications of the machines are given below:

Place of Origin	Taiwan
Brand Name	JY LEH
Model Number	JL-303
Knitting Style	Flat
Computerized	Yes
Available	41 pieces

Features

- Programs are stored in I/C card and can be input to other machines.
- The machine can compile the program input by keyboard without other auxiliary equipment.
- It is adjustable for knitting width without any location limit.
- Feature of single carriage can knit wide or narrow textile of best quality.

Model	JL-303
Gauge	7, 8, 10, 12, 14 and 16G
Bed Width	40"(101cm), 52"(132cm), 68"(172cm)
Carriage Speed	100-120 cm/sec
Knitting Width	Can be set freely
Yarn feeder	Single feeder
Cam Driving	Solenoid driving
Stitch Density	0-99 stepping motor
Yarn Colors	6 colors, both side changeable
Racking	1/2 P x 1 section, 1P x 5 section
Rahben	H-needle tuck, L-needle tuck, all needle tuck
Needles used	High and low butt
Take Down Roller	Automatic auxiliary roller moves with fabric take-down
Data input	Direct input from keyboard, memory by I/C card
Driving	1/2HP, 3 phase, AC motor by frequency converter control
Language	English and Chinese are available.
Power	220V, 50/60Hz, single phase

Dimension	80 x 234 x 185 (cm) / L.W.H for 52"
Specifications	Specifications and appearance may change without notices

Collar:L: 45-50 cm * W:09-10cm * T:3/4/5 ply, 35-45 pcs /Kg(Depends on count, ply of Yarn and tension of knitting.

Cuff: L: 37-39 * W:3.8-4.0cm * T:2/3/4 ply, 60-70 pcs /Kg(Depends on count, ply of yarn and tension of knitting.

Factor should be considered in production:

There should follow several factor when set the program according to buyer requirements.

- a) Ply of Yarn
- b) Width of Collar or Cuff
- c) Stitch Length
- d) Type of Collar & Cuff (e.g. - Fancy, Tripping, Solid etc.)
- e)

2.9 DIFFERENT TYPES OF KNITTING MACHINE:

- ❖ **Singlejersey Circular Knitting Machine:**
- ❖ **Double Jersey Circular knitting Machine**

Singlejersey Circular Knitting Machine:

Mac hine NO	Manufacturer	Cylinder Diameter	Feeders	Gauge	Machine Model	Needles	Safety RPM	Manufacturing Year
1	RUNSHAN (Made in China)	16"	48	24G	RS	1392	24	2008
2	RUNSHAN (Made in China)	17"	51	28G	RS	1488	24	2008
3	RUNSHAN (Made in China)	19"	55	28G	RS	1680	24	2008
4	RUNSHAN (Made in China)	18"	54	28G	RS	1584	24	2008
5	RUNSHAN	30"	30	28G	RS	2640	24	2008

	(Made in China)							
6	RUNSHAN (Made in China)	34"	102	28G	RS	2990	24	2009
7	FALMAC (Made in Singapore)	24"	72	24G	FSB 3 × SK	1810	24	1998
8	FALMAC (Made in Singapore)	21"	63	24G	FSB 3 × SK	1583	24	1999
9	FALMAC (Made in Singapore)	23"	69	24G	FSB 3 × SK	1734	24	1998
10	FALMAC (Made in Singapore)	25"	75	24G	FSB 3 × SK	1885	24	1999
11	FALMAC (Made in Singapore)	22"	66	24G	FSB 3 × SK	1659	24	1998
12	FALMAC (Made in Singapore)	20"	60	24G	FSB 3 × SK	1508	24	1999
13	FALMAC (Made in Singapore)	19"	57	24G	PN 3 × SK	1433	24	2000
14	FALMAC (Made in Singapore)	17"	51	24G	PN3SK-15	1282	24	2000
15	FALMAC (Made in Singapore)	26"	78	24G	PN 3 × SK	1960	24	2000
16	FALMAC (Made in Singapore)	20"	84	24G	PN3SK-15	1507	24	2006
17	FALMAC (Made in Singapore)	23"	69	28G	PN3SK-15	2023	24	2006
18	FALMAC (Made in Singapore)	18"	54	24G	PN3SK-15	1357	24	2006
19	Mayer & Cie	16"	51	28G	MV4-3.2	1408	24	2002

	(Made in Germany)							
20	Mayer & Cie (Made in Germany)	16''	51	28G	MV4-3.2	904	24	2002
21	Mayer & Cie (Made in Germany)	30''	96	28G	RELANIT411	2639	24	2002
22	Mayer & Cie (Made in Germany)	30''	96	28G	RELANIT411	2639	24	2002
23	Mayer & Cie (Made in Germany)	30''	96	28G	RELANIT411	2639	24	2002
24	Mayer & Cie (Made in Germany)	30''	96	28G	RELANIT411	2639	24	2002
25	Mayer & Cie (Made in Germany)	30''	96	28G	RELANIT411	2639	24	2002
26	Mayer & Cie (Made in Germany)	30''	96	28G	RELANIT411	2639	24	2002
27	JIUNN LONG Machine Co. Ltd(Taiwan)	34''	102	24G	JLS-C	2544	13	2012
28	JIUNN LONG Machine Co. Ltd(Taiwan)	34''	102	24G	JLS-C	2544	13	2012
29	JIUNN LONG Machine Co. Ltd(Taiwan)	34''	102	24G	JLS-C	2544	13	2012
30	JIUNN LONG Machine Co. Ltd(Taiwan)	36''	108	24G	JLS-2	2712	13	2012
31	JIUNN LONG Machine Co. Ltd(Taiwan)	36''	108	24G	JLS-2	2712	13	2012
32	JIUNN LONG Machine Co. Ltd(Taiwan)	36''	108	24G	JLS-2	2712	13	2012
33	Mayer & Cie (Made in Germany)	30''	96	28G	RELANIT411	2639	24	2002
34	Mayer & Cie (Made in Germany)	30''	96	28G	RELANIT411	2639	24	2002
35	Mayer & Cie (Made in Germany)	30''	96	28G	RELANIT411	2639	24	2002

	Germany)								
36	Mayer & Cie (Made in Germany)	30''	96	28G	RELANIT411	2639	24	2002	
37	Mayer & Cie (Made in Germany)	30''	192	28G	RELANIT1.6R	2639	24	2002	
38	Mayer & Cie (Made in Germany)	30''	192	28G	RELANIT1.6R	2639	24	2002	
39	Mayer & Cie (Made in Germany)	30''	96	28G	RELANIT411	2639	24	2002	

Double Jersey Circular knitting Machine:

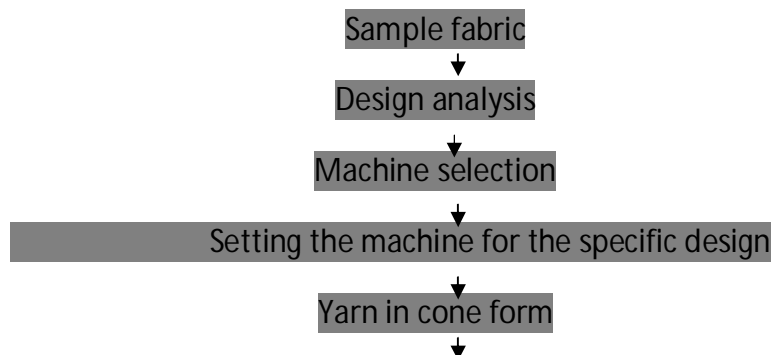
Machine NO	Manufacturer	Cylinder Diameter	Feeders	Gauge	Machine Model	Needles	Safety RPM	Manufacturing Year
01	Mayer & Cie (Made in Germany)	12''	23	18G	FV 2.0	2×684	24	2002
02	Mayer & Cie (Made in Germany)	14''	29	18G	FV 2.0	2×792	24	2002
03	Mayer & Cie (Made in Germany)	16''	33	18G	FV 2.0	2×900	24	2002
04	Mayer & Cie (Made in Germany)	16''	33	18G	FV 2.0	2×900	24	2002
05	Mayer & Cie (Made in Germany)	18''	37	18G	FV 2.0	2×1008	24	2002
06	Mayer & Cie (Made in Germany)	18''	37	18G	FV 2.0	2×1008	24	2002
07	Mayer & Cie (Made in Germany)	30''	96	24G	OV 3.2 QC	2×2268	24	2002
08	Mayer & Cie (Made in Germany)	30''	96	24G	OV 3.2 QC	2×2268	24	2002
09	Mayer & Cie	30''	96	24G	OV 3.2	2×2268	24	2000

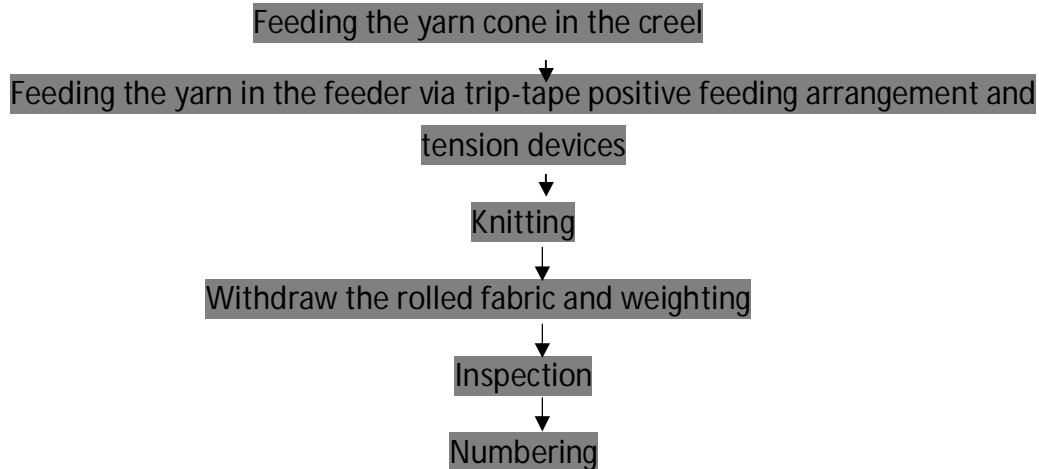
	(Made in Germany)							
10	Mayer & Cie (Made in Germany)	30''	96	24G	OV 3.2	2×2268	24	2000
11	Mayer & Cie (Made in Germany)	30''	96	24G	OV 3.2	2×2268	24	2000
12	Mayer & Cie (Made in Germany)	30''	60	18G	FHG11	2×1680	24	2002
13	Mayer & Cie (Made in Germany)	24''	54	18G	FV 2.0	2×1476	24	2002
14	Mayer & Cie (Made in Germany)	24''	50	18G	FV 2.0	2×1344	18	2002
15	Mayer & Cie (Made in Germany)	22''	45	18G	FV 2.0	2×1248	18	2002
16	Mayer & Cie (Made in Germany)	20''	41	18G	FV 2.0	2×1128	24	2002
17	Mayer & Cie (Made in Germany)	30''	96	24G	OV 3.2	2×2268	24	2002

Remarks:

Production runs with the help of mechanical fitters. For any kind of mechanical fault of any machine the fix and work under technical in charge. Production officers take account of daily production by running after the supervisor and workers so on.

2.10 Process flow chart of knitting:





2.11 Description of Production Process:

In every mill, there maintains a sequences in production processing. It is also followed in this mill where we were in industrial attachment. The process sequences are in list below:

- I. Firstly, knitting manager gets a production shit from the merchandiser as accordance as consumer requirements then he informs or orders production officer about it.
- II. Production officer informs technical in charge and knows about machine in which the production will be running.
- III. Technical in charge calls for leader of mechanical fitter troops, they two take decision about machine for production considering machine condition, production capacity, maintenance complexity, etc
- IV. Production officer with experienced mechanical fitter adjusts required stitch length and grey GSM for required final GSM.
- V. Supervisor checks daily production regularity and make operator conscious about finishing tin due time.
- VI. Operators operate machine in high attention as if there were no faults in the fabrics. If he thinks or sure about any fabric fault, then he calls for the mechanical fitters in duty. Mechanical fitter then fixes it if he can or he informs technical in charge. Then he comes in spot.
- VII. After required production and final inspection in 4-point system, they sent in dyeing section.

2.11.1 Production Parameters:

- Machine Diameter;
- Machine rpm (revolution per minute);
- No. of feeds or feeders in use;
- Machine Gauge;
- Count of yarn;

- Required time (M/C running time)
- Machine running efficiency.

2.11.2 Relationship between knitting parameters:

- Stitch length increase with the increase of GSM.
- If stitch length increase then fabric width increase and WPI decrease.
- If machine gauge increase then fabric width decrease.
- If yarn count increase (courser) then fabric width increase.
- If shrinkage increases then fabric width decrease but GSM and WPI increase.
- For finer gauge, finer count yarn should use.
- Grey GSM should be less than finish GSM.

2.11.3 Considerable points to produce knit fabric:

Before production of knitted fabric, these factors are needed to consider. These includes

- ↗ Type of Fabric or design of Fabric.
- ↗ Finished G.S.M.
- ↗ Yarn count
- ↗ Types of yarn (combed or carded)
- ↗ Diameter of the fabric.
- ↗ Stitch length
- ↗ Color depth.

2.12 G.S.M

It is technical term that indicates the weight of the fabric per square meter.

Points considered while setting grey GSM:

- ↗ Enzyme level
- ↗ Color
- ↗ Suided or non- suided

Changing of GSM:

- ↗ Major control by VDQ pulley.
- ↗ Minor control by stitch length adjustment.
- ↗ Altering the position of the tension pulley changes the G.S.M. of the fabric. If pulley moves towards the positive directive then the G.S.M. is decrease. And in the reverse direction G.S.M will increase.

Factors that should be changed in case of fabric design:

- ↗ Cam setting
- ↗ Set of needle

↗ Size of loop shape

Effect of stitch length of color depth:

If the depth of color of the fabric is high loop length should be higher because in case of fabric with higher loop length is less compact. In dark shade dye take up% is high so GSM is adjusted then. Similarly in case of light shade loop length should be relatively smaller.

Methods of increasing production:

By the following methods the production of knitted fabric can be increased –

1. By increasing m/c speed:

Higher the m/c speed faster the movement of needle and ultimately production will be increased. But it has to make sure that excess tension is not imposed on yarn because of this high speed.

2. By increasing the number of feeder:

If the number of feeder is increased in the circumference of cylinder, then the number of courses will be increased in one revolution at a time.

3. By using machine of higher gauge:

The more the machine gauge, the more the production is. So by using machine of higher gauge production can be increased.

4. By imposing automation in the m/c:

- a) Quick starting & stopping for efficient driving system.
- b) Automatic m/c lubrication system for smoother operation.
- c) Photo electric fabric fault detector.

5. By imposing other developments:

- a) Using creel-feeding system.
- b) Applying yarn supply through plastic tube that eliminates the possibilities of yarn damage.
- c) Using yarn feed control device.

2.13 Faults and their causes in knitting:

Hole mark:

Causes:

- ↗ Buckling of the needle latch
- ↗ Buckling the sinker
- ↗ Higher G.S.M

Star mark:

Causes:

- ↗ Buckling of the needle latch.
- ↗ Yarn tension variation during production.
- ↗ Low G.S.M.

Oil spot/Grease spot:

Causes:

- ↗ Excess oil/Grease use.
- ↗ Jamming of needle & sinker.

Patta:

Causes:

- ↗ Yarn comes from different lot.
- ↗ Faulty cam use in the m/c.

Needle mark:

Causes:

- ↗ Faulty needle use in the m/c.

Sinker mark:

Causes:

- ↗ Faulty sinker use in the m/c

Fabric Shrinkage:

Causes:

↗ Yarn twist
 ↗ Knitting tension
 ↗ Fabric G.S.M.

Twist ↑ Shrinkage ↑
 G.S.M. ↑ Shrinkag ↑

2.14 Different Fabric GSM and Their Yarn Count:

A. S/J without lycra -

Fabric G.S.M	Yarn Count
110 – 120	40 ^S – 36 ^S
120 – 130	36 ^S - 32 ^S
130 – 140	32 ^S – 28 ^S
140 – 150	28 ^S
150 – 160	26 ^S
170 – 210	24 ^S

B. Rib without lycra -

Fabric G.S.M	Yarn Count
180 – 190	36 ^S - 32 ^S
190 – 200	30 ^S
200 – 215	28 ^S
215 – 230	26 ^S
230 – 250	24 ^S
250 – 300	24 ^S

C. Interlock without lycra -

Fabric G.S.M	Yarn Count
200 – 220	34 ^S
220 – 230	32 ^S
230 – 250	30 ^S
250 – 300	26 ^S

D. Lacoste without lycra -

Fabric G.S.M	Yarn Count
180 – 190	30 ^S
190 – 210	28 ^S
210 – 230	26 ^S
230 – 250	26 ^S

E. 40D Lycra Rib -

Fabric G.S.M	Yarn Count
230 – 240	32 ^S
240 – 250	30 ^S
250 – 280	26 ^S
280 – 300	24 ^S

F. 40D Lycra S/J –

Fabric G.S.M	Yarn Count
180 – 190	34 ^S
190 – 210	32 ^S
210 – 220	30 ^S
220 – 240	28 ^S
240 – 250	26 ^S

2.15 Different Parts of Knitting Machine:

Creel: Creel is used to place the cone.

Feeder: Feeder is used to feed the yarn.

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

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

Guide: Guide is used to guide the yarn.

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

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

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

Fixation feeder: These types of feeder are used in Electrical Auto Striper Knitting Machineto feed the yarn at specific finger.

2.15.1 Production Calculation:

A. Production/shift in kg at 100% efficiency

$$= \frac{RPM \times \text{No. of Feeder} \times \text{No. of Needle} \times SL(\text{mm})}{3527.80 \times \text{Yarn count}}$$

B. Production/shift in meter

$$= \frac{\text{Course / min.}}{\text{Course / cm}}$$

$$= \frac{RPM \times \text{No. of Feeder} \times 60 \times 12 \times \text{Efficiency}}{\text{Course / cm} \times 100}$$

C. Fabric width in meter:

$$= \frac{\text{Total no. of wales}}{\text{Wales / cm} \times 100}$$

$$= \frac{\text{Total no. of Needles used in knitting}}{\text{Wales / cm} \times 100}$$

D. Calculation for total number of needle of a machine = $G \times D \times \pi$

Here,

G = Machine gauge

D = Machine diameter

E. From finish G.S.M calculating grey GSM, SL, count:

Suppose a fabric involve 180 finishes G.S.M

$$\text{So, gray G.S.M} = \frac{\text{Finish G.S.M}}{1.3} = \frac{180}{1.3} = 138$$

$$\text{So, count} = \frac{4320}{F.G.S.M} = \frac{4320}{180} = 24/s$$

$$\text{So, S.L} = \frac{95351.5}{\text{count} \times G.GSM} = \frac{95351.5}{24 \times 138} = 28.78 \text{ cm} = 2.9 \text{ mm}$$

F. Calculation of S.L where yarns count = 24:

$$\rightarrow \text{S.L} = 16.66d$$

$$= 16.66 \frac{1}{28\sqrt{\text{count}}}$$

$$= 16.66 \frac{1}{28\sqrt{24}} = .308 \text{ cm} = 3.08 \text{ mm}$$

2.16 Photo gallery



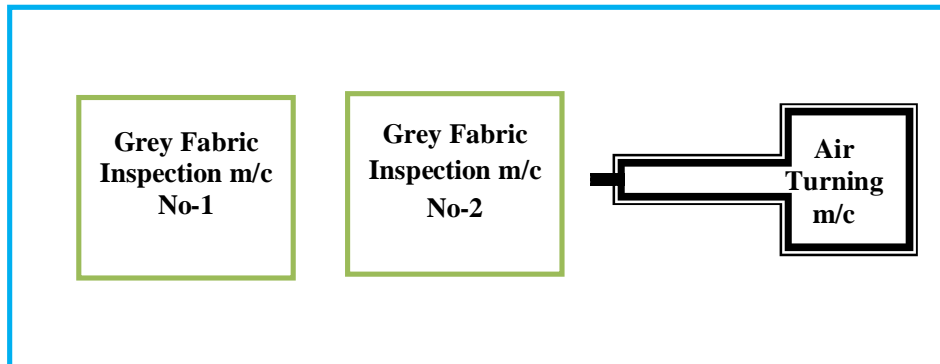
CHAPTER: 3



3. Batching Section

3.1 Batching Section

Layout of Batching Section:



Grey Fabric Inspection:

The inspection and grading of fabric quality is one of the important functions of Quality Control in the grey or finished state, the grading of fabric is a difficult task, taking two primary considerations: as the frequency of effects and the seriousness of defects.

The grading has two primary functions: First, to classify the fabrics according to standard qualities based on the end-use and customer demands and second, to supply information as to the qualities actually being produced.



Grey Fabric Inspection

3.1.1 General Instructions for the final inspection:

- a) All pieces will be graded on the base of 40 points per 100 Linear yards Mapping will be done on each piece to insure proper grading. Do not count more than 4 points per one yard.
- b) All defects must be recorded and marked in final inspection and an accurate account of points made to insure proper grading.
- c) All fabric must meet specifications.
- d) At the end of each piece of fabric, the inspector will add up total points and decide whether the piece can be shipped as first quality or not, reworked, placed in lower quality, or cut and upgraded for shipment. Fifteen yards or more can be shipped as first quality.
- e) The quality control supervisor must approve the grading of all quality levels and check the lower quality.
- f) Major or unsightly defects in the first and last yard of a roll or piece will be cut. All defects of one yard length or more will be cut out of the piece. Defects within the first 2 inches or the last 2 inches of a piece will not be cut out or counted in the grading.
- g) Open defects on the back of fabric such as drops, runs and hanging picks are to be included in the grading of fabric.
- h) Pieces can be connected together, once each piece must be the same shade.
- i) All defects such as runs that extend more than a yard in length will be cut out.
- j) Fabric up to 70 inches will be allowed a bow of not more than 1 inch and a Bias of not more than 2 inches.
- k) Defects within one inch of the fabric edge will not be counted except on tubular fabrics. All defects will be counted in tubular goods.

3.1.2 Grading procedure:

- ↗ All open defects or major defects counted with 4 points per defect.
- ↗ Surface defects over 9 inch length counted with 4 points per defect.
- ↗ Surface defects 6 to 9 inches length counted with 3 points per defect.
- ↗ Surface defects 3 to 6 inches length counted with 2 points per defect.
- ↗ Surface defects up to 3 inches length counted with one point per defect.
- ↗ Running defects, such as tucks, needle lines, barre, crack marks, are judgment defects

Batching is the process to get ready the fabrics which should be dyed and processed for a particular lot of a particular order.

3.2 Object of Batching:

- ↗ To receive the grey fabric roll from knitting section or other source.
- ↗ Turn the grey fabric if require.
- ↗ To prepare the batch of fabric for dyeing according to the following criteria –
- ↗ Order sheet (Received from buyer)
- ↗ Dyeing shade (color or white, light or dark)
- ↗ M/C capacity
- ↗ M/C available
- ↗ Type of fabrics(100% cotton, PET, PC, CVC)
- ↗ Emergency
- ↗ To send the grey fabric to the dyeing floor with batch card.
- ↗ To keep records for every previous dyeing.

3.2.1 Proper batching criteria:

- ↗ To use maximum capacity of existing dyeing m/c.
- ↗ To minimize the washing time or preparation time & m/c stoppage time.
- ↗ To keep the no. of batch as less as possible for same shade.
- ↗ To use a particular m/c for dyeing same shade.

3.2.2 Batch management:

Primarily batching is done by dyeing manager taking the above criteria under consideration. Batch section in charge receives this primary batch plan from dyeing manager. Some time planning is adjusted according to m/c condition or emergency.

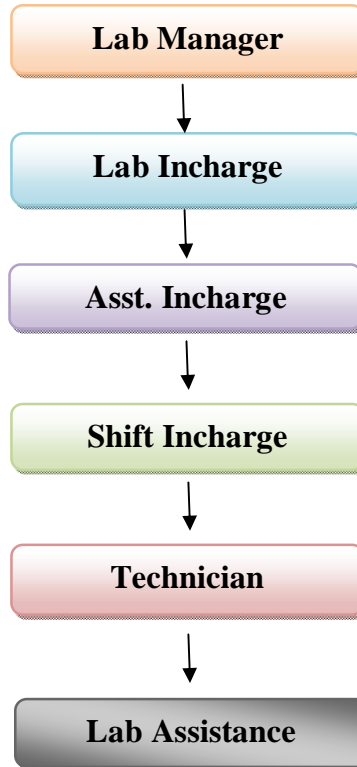
3.3 M/Cs in batch section

No. of M/c	: 01
Machine name	: Air turning machine
Origin	: KOREA

No. of M/c	: 02
Machine name	: Fabric Inspection machine
Origin	: KOREA

4.1 Dyeing Centre Lab Section

4.1.1 Organ gram of color lab:



Definition:

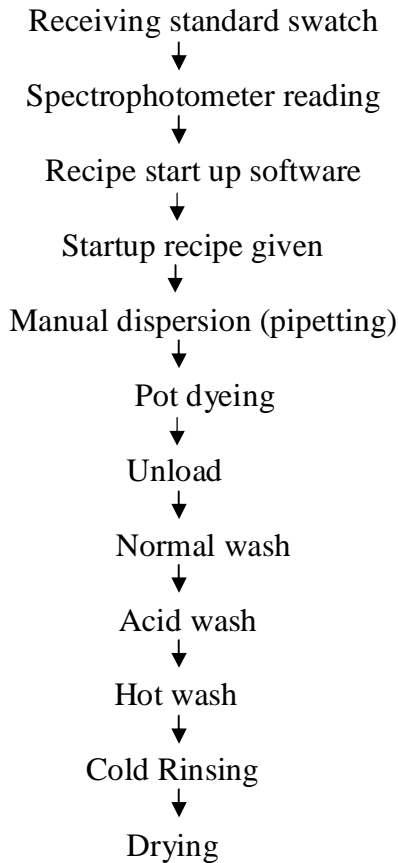
LAB dip development means the sample which is dyed according to buyer's requirements (similar shade and so on). Depending on lab dip development sample dyeing and bulk production the dyeing planning done.

4.1.2 Objective of Lab Dip:

The main objectives in LAB dip are as follows:

- ↗ To calculate the recipe for sample dyeing.
- ↗ To compare dyed sample with swatch by light Box or Spectroflash.
- ↗ To calculate revise recipe for sample dyeing.
- ↗ Finally approved Lab Dip (Grade: A B C).

4.1.3 Development of Dip:



4.1.4 Preparation and storage of stock dyes:

Preparation of Concentration of stock dye solⁿ -

Normally 0.1%, 0.5%, 1%, 1.5%, 2% and 4% stock solution of dyes are prepared in beakers for daily used.

Preparation of Concentration of stock chemical solⁿ-

Similarly 25% salt and 25% soda stock solutions are prepared in beakers for daily use.

4.1.5 Types of Pipette:

- 0.1ml
- 0.2ml
- 0.5ml
- 1.0ml
- 2.0ml
- 5.0ml
- 10ml
- 20ml

4.1.6 Dyes and chemicals measuring formula for lab:

The amount of dye solution (ml) is calculated as follow -

$$\text{Amount of dye sol}^n \text{ (ml)} = \frac{\text{Fabric weight} * \text{Shade \%}}{\text{Concentration of stock dye sol}^n \%}$$

Example –

In recipe, Fabric wt. = 5gm
 Shade % = 2%

[If used 0.5 % stock solⁿ of dyes] then ,

$$\text{Amount of dye sol}^n \text{ (ml)} = \frac{5 * 2}{0.5} = 20\text{ml} .$$

The amount of chemical solⁿ (ml) is measured as follow -

$$\text{Amount of chemical sol}^n \text{ (ml)} = \frac{\text{Fabric wt.} * \text{M : L} * \text{g/l}}{1000 * \text{Conc. of stock sol}^n \%}$$

Example –

In recipe, Fabric wt. = 5 gm
 Salt = 20 g/l
 M: L = 10

[If taken 25 % stock solⁿ of salt] then ,

$$\text{Amount of chemical sol}^n \text{ (ml)} = \frac{5 * 10 * 20}{1000 * 0.25} = 4 \text{ ml}$$

4.2 Machineries for lab dip:

Machine No-1	Types	Water Heater
	Brand	Fongs
	M/C No	SDM2-12-140
	SER NO	93-10-017
	Volt	415
	Amp.	13
	Origin	Hongkong

Machine No-2	Types	Dry Iron
	Brand	Sebec
	Model	SDI-8
	SER NO	93-10-017
	Volt	220-240 volts(50-60Hz)
	Origin	China

Machine No-3	Types	Sample Dyeing Machine
	Brand	Datacolor AHIBA IR™
	Model	SDI-8
	SER NO	93-10-017
	Volt	220-240 volts(50-60Hz)
	Origin	USA

Machine No-4	Types	Sample Dyeing Machine
	Brand	ECO Datacolor AHIBA NUANCE
	Model	SDI-8
	SER NO	93-10-017
	Volt	220-240 volts(50-60Hz)
	Origin	USA

Machine No-5	Types	Spectrophotometer
	Brand	Datacolor
	Model	SDI-8
	SER NO	93-10-017
	Volt	220-240 volts(50-60Hz)
	Origin	USA

Machine No-5	Types	CMC(Light Box)
	Brand	Verivide
	Light-1	TL84
	Light-2	-D65
	Light-3	-Florescent
	Light-4	-Ultraviolet (UV)

4.3 Salt and Soda for 30% stock solution:

Salt and Soda (g/l)	Salt & Soda Solution (C.C)
4	0.53
5	0.67
6	0.80
7	0.93
8	1.07
10	1.33
12	1.60
14	1.87
15	2.00
17	2.27
18	2.40
20	2.65
25	3.30
30	4.00
40	5.33
50	6.70
60	8.00
70	9.30
80	10.66
100	13.30

For production:

S/L	SHADE %	SALT	SODA
01	0.001-0.1	12	5
02	0.1-0.5	15	6
03	0.5-1.0	20	7
04	1.0-1.5	30	8
05	1.5-3.0	40	9
06	3.0-4.0	50	10
07	4.0-7.0	60	13

4.4 Photo Gallery Of
Dyeing lab



Sample Dyeing Machine



Shrinkage Tester

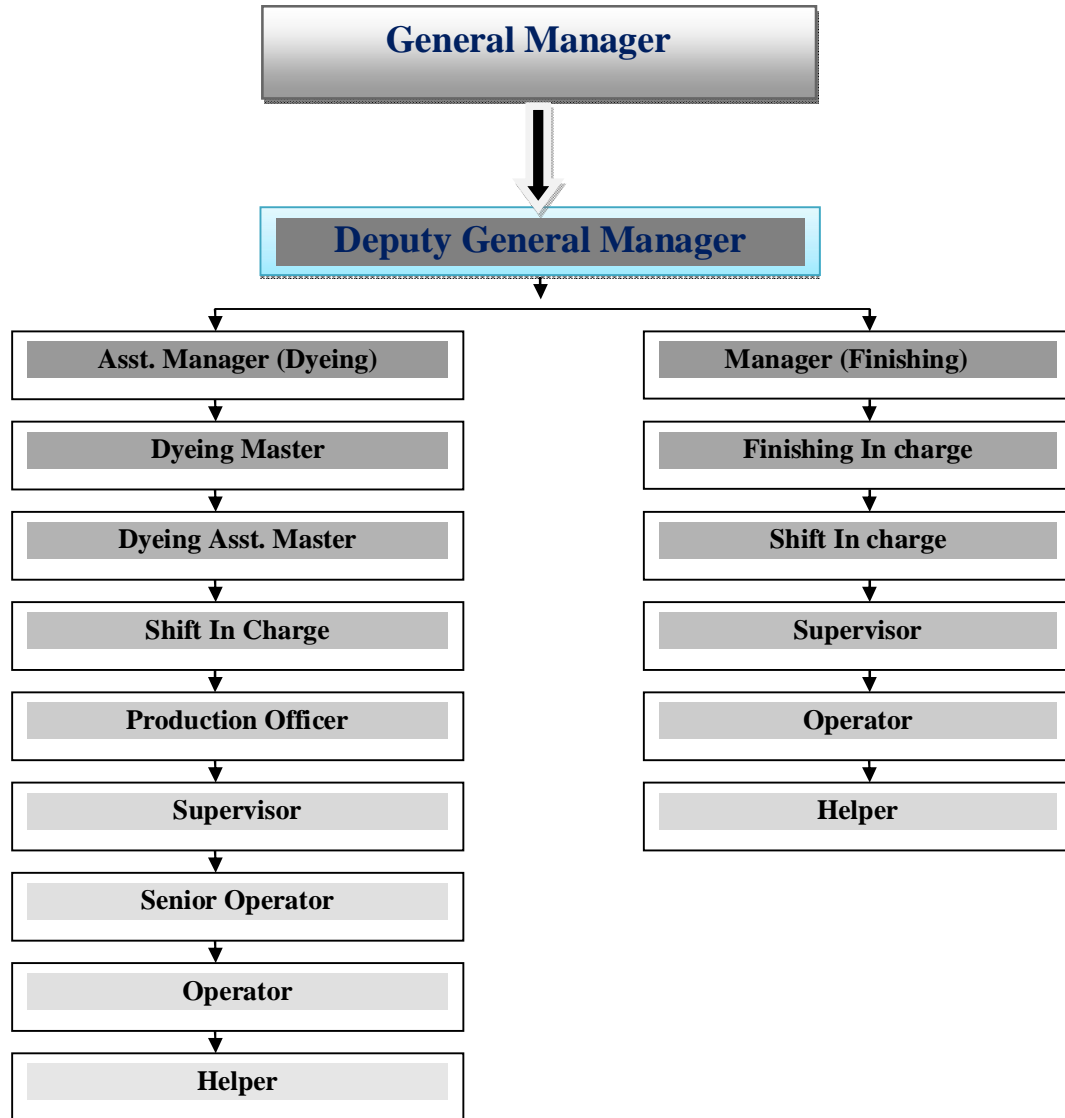


Spectro photometer

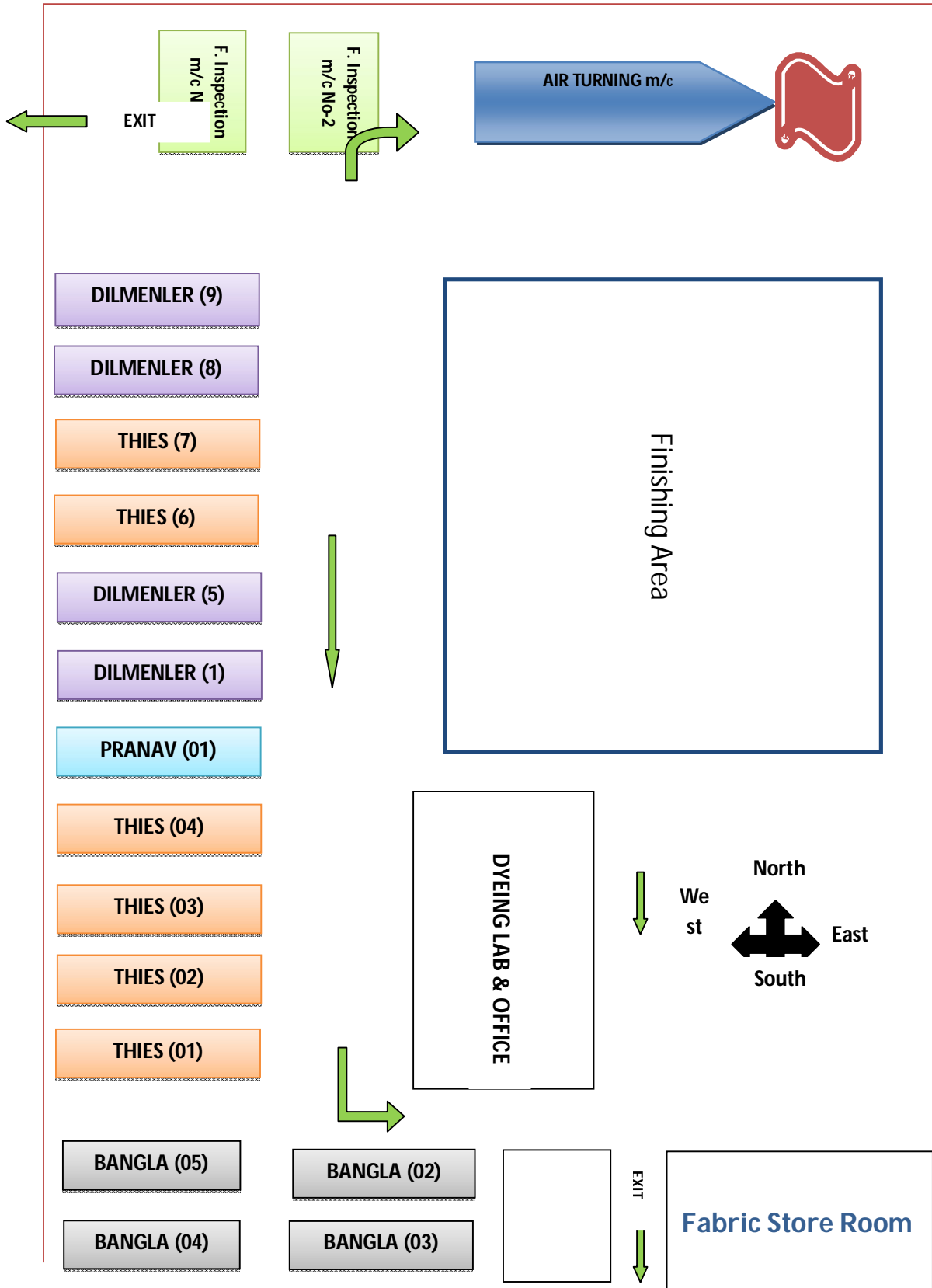


4.5 Dyeing Section

Organogram of Dyeing & Finishing Section:



4.6 Layout of dyeing Section



4.7 Dye & chemicals Used in Purbani Fabrics Ltd:

Aids	Chemicals Name	Price (kg/tk)
General Chemicals	Soda Ash	20
	Caustic	37
	H ₂ O ₂	41
	Hydrose	52
	Antifoam-39	400
	Gluber Salt (anhydrous)	17
Acid	H ₂ SO ₄	
	Acetic Acid	70-97
	Formic Acid	
	Oxalic Acid	
Cationic Softener		210-230
Anti-crease		140-165
		180-200
Fixing		360-400
Buffer		30-160
		117-145
Sequestering		110-163
Enzyme		480-550
Stabilizer		145-210
Brightener		289-550

4.8 Responsibility of production officer:

- ❖ Overall supervision of dyeing & finishing.
- ❖ Dyes & chemicals requisition issue & check.
- ❖ Program making, sample checking color measurement.
- ❖ Control the supervisor's operators & helpers of machines.
- ❖ To give dye-line or the program slip according to daily production plan, batch preparation & P^H check.
- ❖ To rectify the finished fabric which rejected from quality control department?
- ❖ To check daily production report.
- ❖ To study dye & chemicals nature delivery by the manufacture & applied them correctly to the production to get best product.

4.8.1 Job Description:

Title: Production officer.

Dept: Dyeing

Report to: Senior production officer.

Job summary: To plan execute & follow up the production activities & control the quality production with related activities.

4.9 Machine Description:

Machine Type	Quantity
Winch dyeing m/c HT&HP	03
Winch dyeing m/c(Sample)	01
Winch dyeing m/c(Atmospheric)	06
Bangla dyeing m/c(Sample)	04

Machine no:01

Machine name	Winch dyeing m/c(Atmospheric)
Brand	Thies
Origin	Germany
Capacity	200 kg
Nozzle pressure	0.5 bar
Temperature range	Up to 98 ⁰ C

Machine no:02

Machine name	Winch dyeing m/c
Brand	Thies
Origin	Turkey
Capacity	400 kg
Nozzle pressure	0.5 bar
Temperature range	Up to 98 ⁰ C

Machine no:03

Machine name	Winch dyeing m/c
Brand	Thies
Origin	Germany
Capacity	400 kg
Nozzle pressure	0.5
Temperature range	Up to 98 ⁰ C

Machine no:04

Machine name	Winch dyeing m/c
Brand	Thies
Origin	Germany
Capacity	600 kg
Nozzle pressure	0.5 bar
Temperature range	Up to 98 ⁰ C

Machine no:05

Machine name	HT Winch dyeing m/c
Brand	Dilmenler
Origin	Turkey
Capacity	900 kg
Pressure	2.5 bar
Temperature range	Up to 135 ⁰ C

Machine no:06

Machine name	Winch dyeing m/c
Brand	Thies
Origin	Germaany
Capacity	250 kg
Temperature range	Up to 98 ⁰ C

Machine no:07

Machine name	Winch dyeing m/c(Atmospheric)
Brand	Thies
Origin	Germany
Capacity	750 kg
Nozzle pressure	0.5 bar
Temperature range	Up to 98 ⁰ C

Machine no:08

Machine name	HT Winch dyeing m/c
Brand	Dilmenler
Origin	Turkey
Capacity	600 kg
Nozzle pressure	0.5 bar
Temperature range	Up to 98 ⁰ C

Machine no:09

Machine name	HT winch Dyeing m/c
Brand	Dilmenler
Origin	Turkey
Capacity	600 kg
Temperature range	Up to 135 ⁰ C

Machine no:10

Machine name	Pranav Aqua Soft HT & HP soft flow fabric dyeing machine
Brand	Pranav
Origin	India
Capacity	25 kg
Temperature range	Up to 135 ⁰ C

Machine no:11

Machine name	Sample Dyeing Machine
Brand	Bangla
Origin	Bangladesh
Capacity	50 kg
Temperature range	Up to 98 ⁰ C

Machine no:12

Machine name	Sample dyeing m/c
Brand	Bangla
Origin	Bangladesh
Capacity	50 kg
Temperature range	Up to 98 ⁰ C

Machine no:13

Machine name	Sample dyeing m/c
Brand	Bangla
Origin	Bangladesh
Capacity	50kg
Temperature range	Up to 98 ⁰ C

Machine no: 14

Machine name	Sample dyeing m/c
Brand	Bangla
Origin	Bangladesh
Capacity	50 kg
Temperature range	Up to 98 ⁰ C

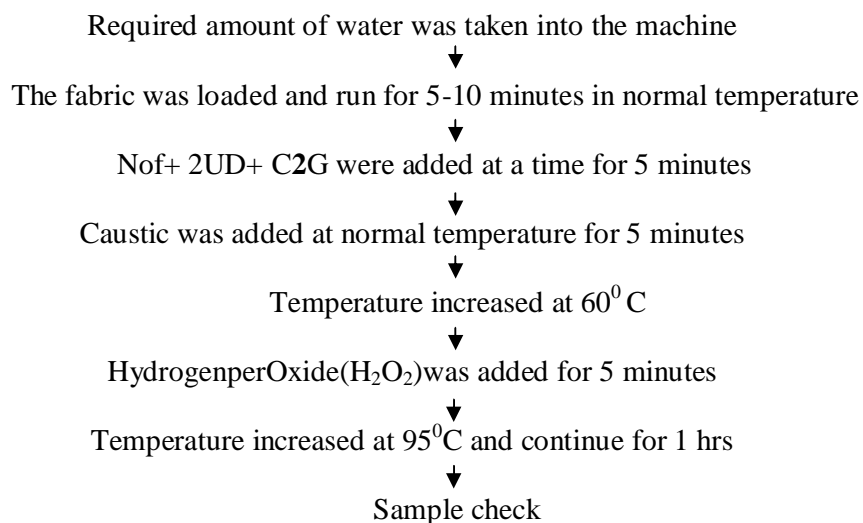
4.10 Different parameters in dyeing:

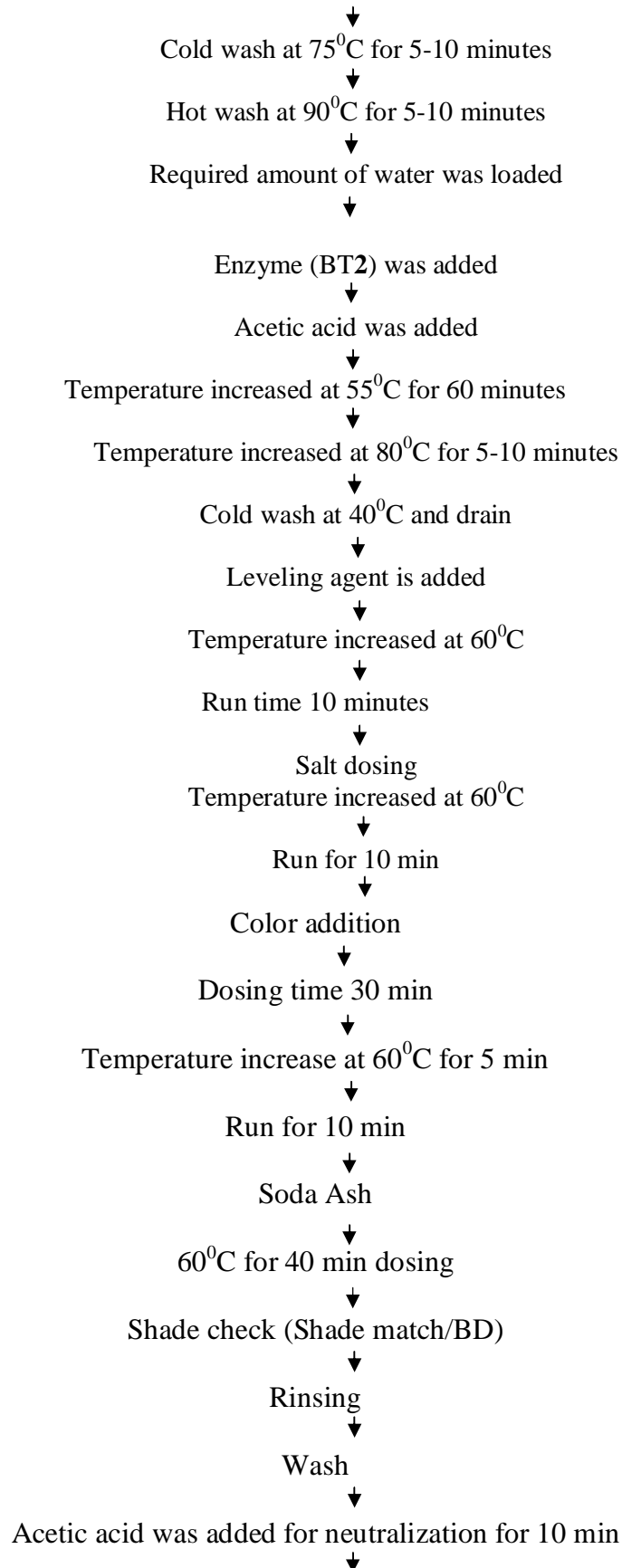
A. pH	
During peroxide bleaching & scouring	9-11
During enzyme treatment	4.5-5
Before addition of leveling agent	6-6.5
Before addition of color softener	6-6.5
Before addition of white softener	4.5-5
Softener at stenter & de-watering	5.5-6
Silicon softener	5.5-6
Reactive dyeing	10.5-12
Disperse dyeing	4.5-5.5

B. Temperature	
For cotton scouring	95-100°C
For cotton bleaching	50-60°C
For cotton hot wash	70-80°C
For cotton acid wash	60-70°C
For cotton dyeing	80°C (For hot brand)/60°C(For cold brand)

C. Time	
For scouring and bleaching	60-90 mins
For reactive dyeing	60-90 mins
For disperse dyeing	60-90 mins

4.11 Cotton Dyeing steps with Curve:





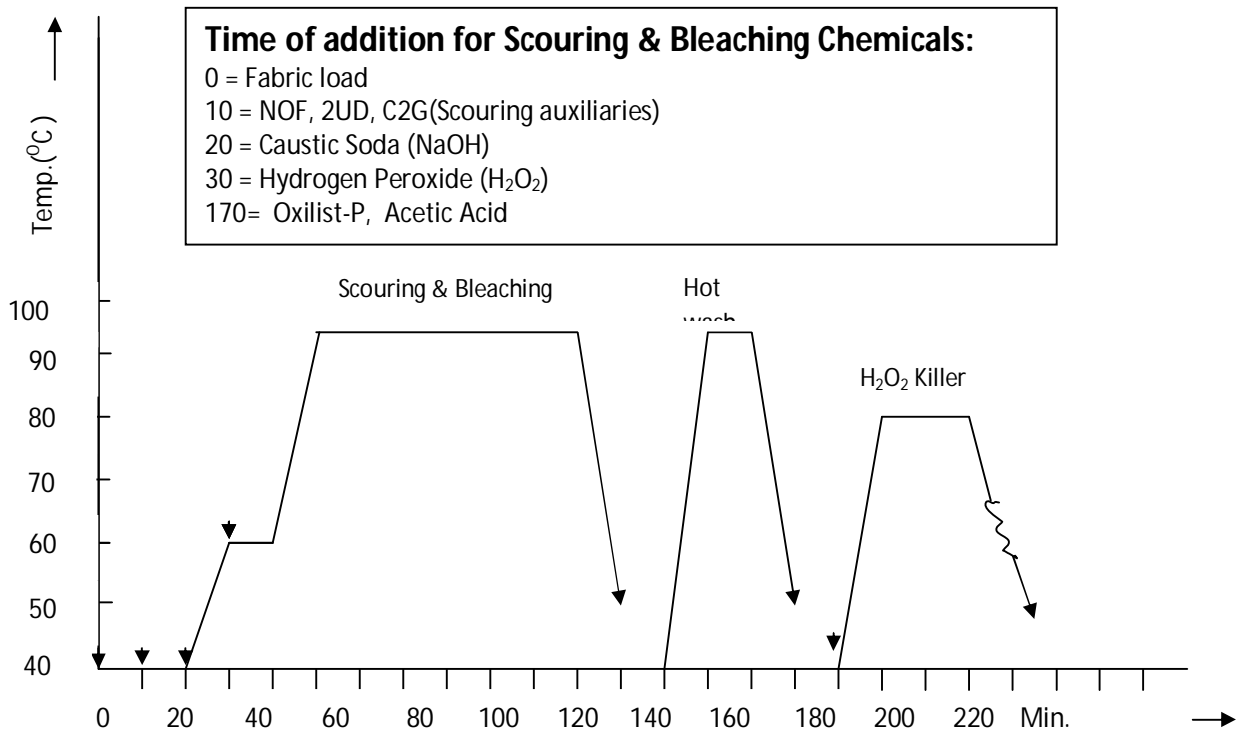
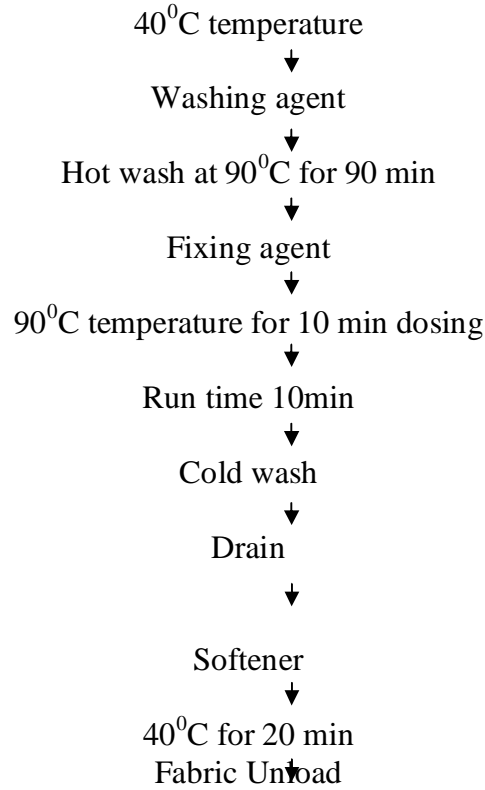
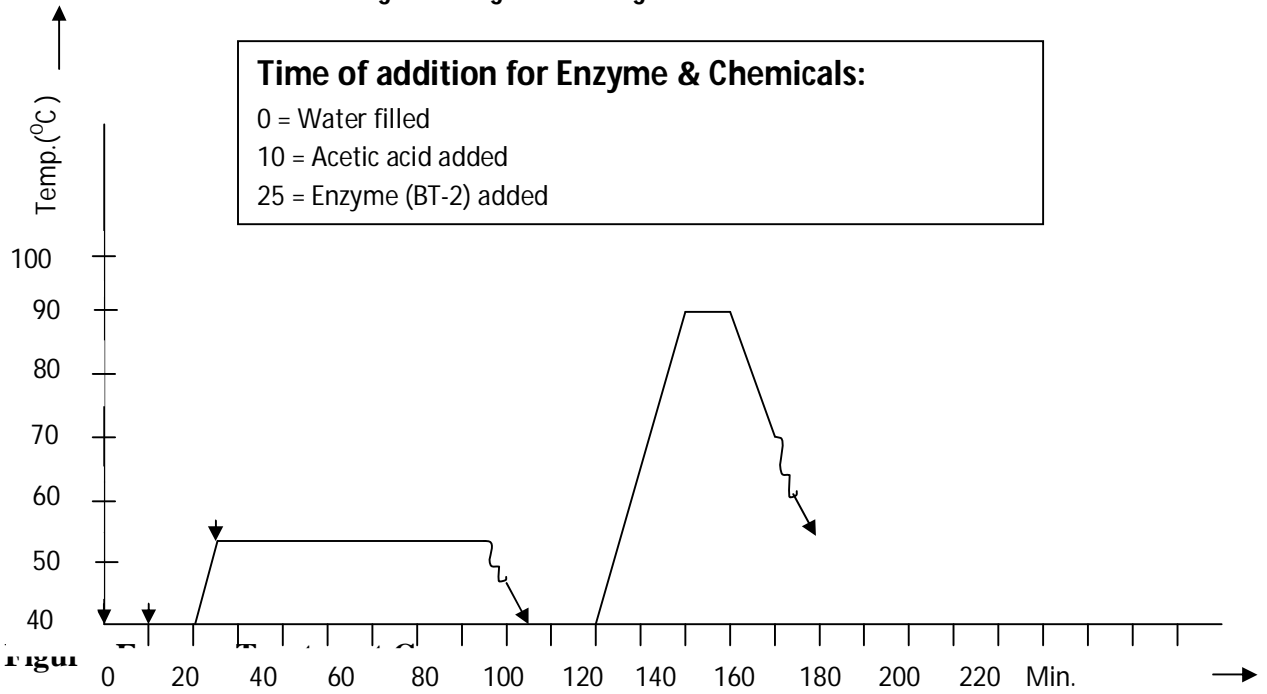
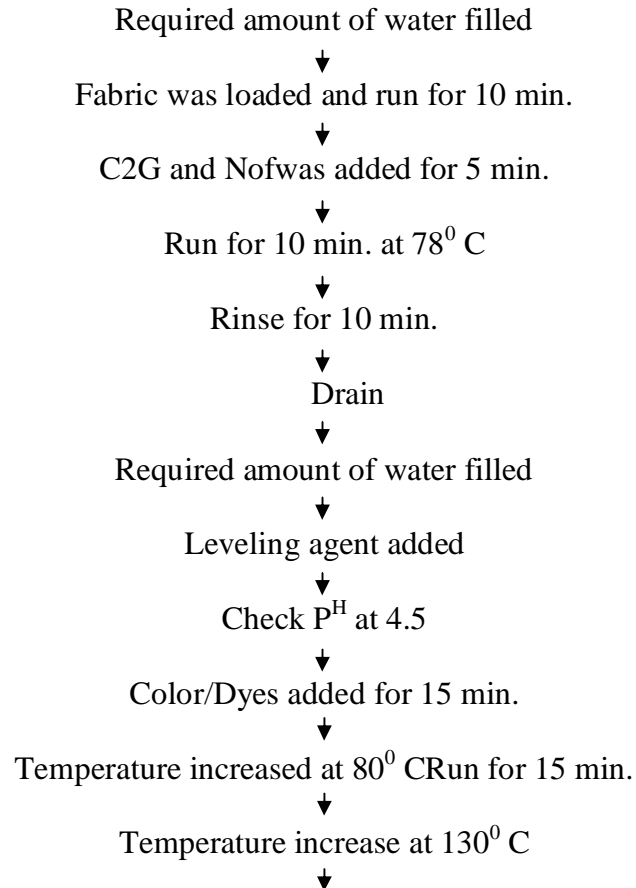
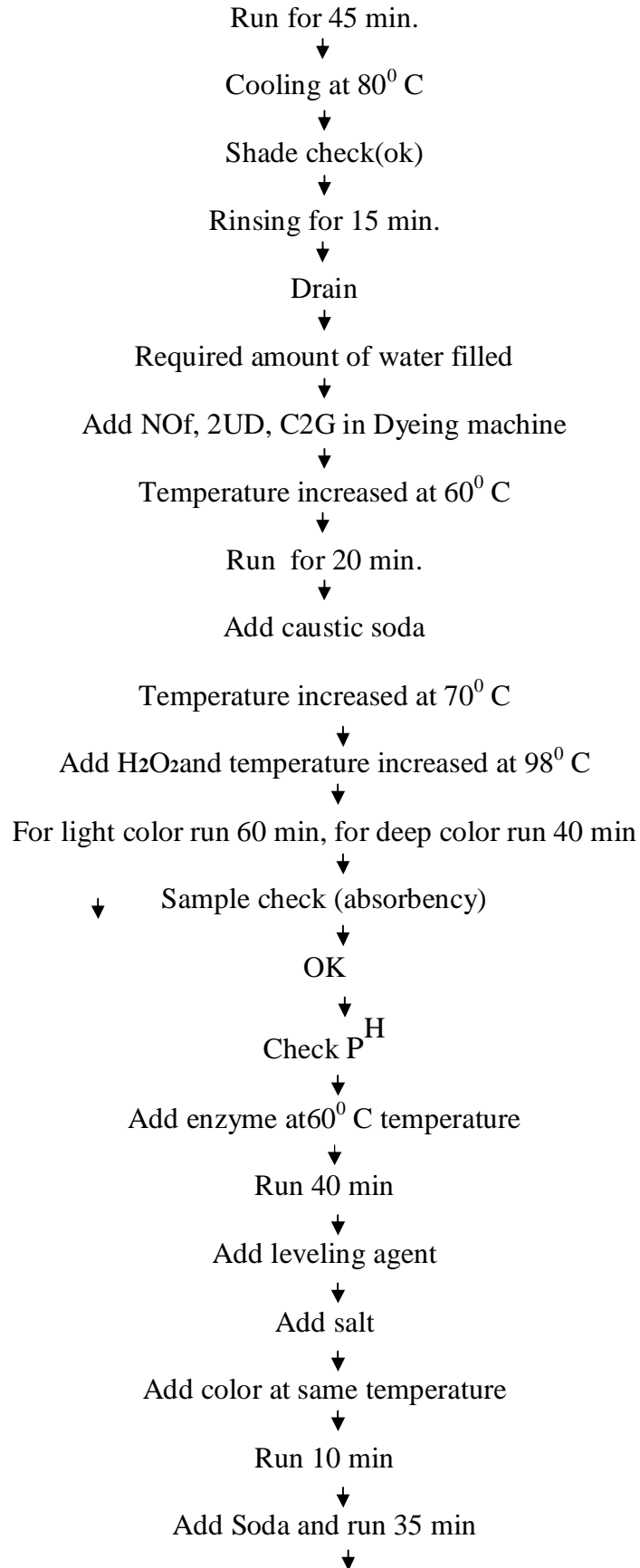


Fig: Scouring & Bleaching treatment curve.



4.12 Dyeing Procedure of polyester/cotton blend fabrics with Curve:





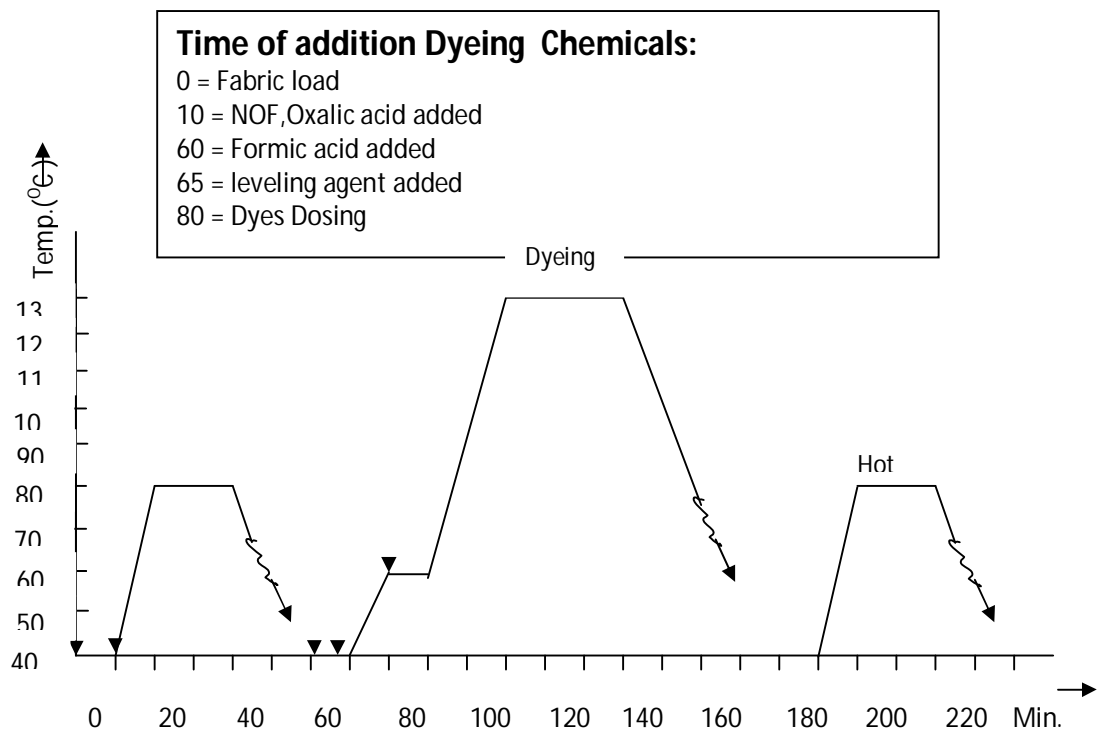
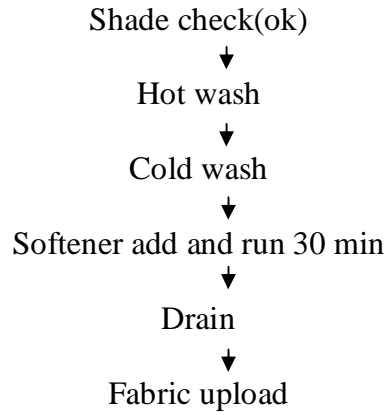
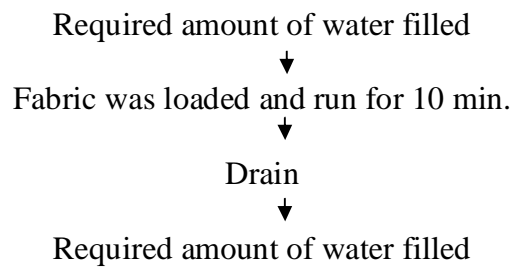
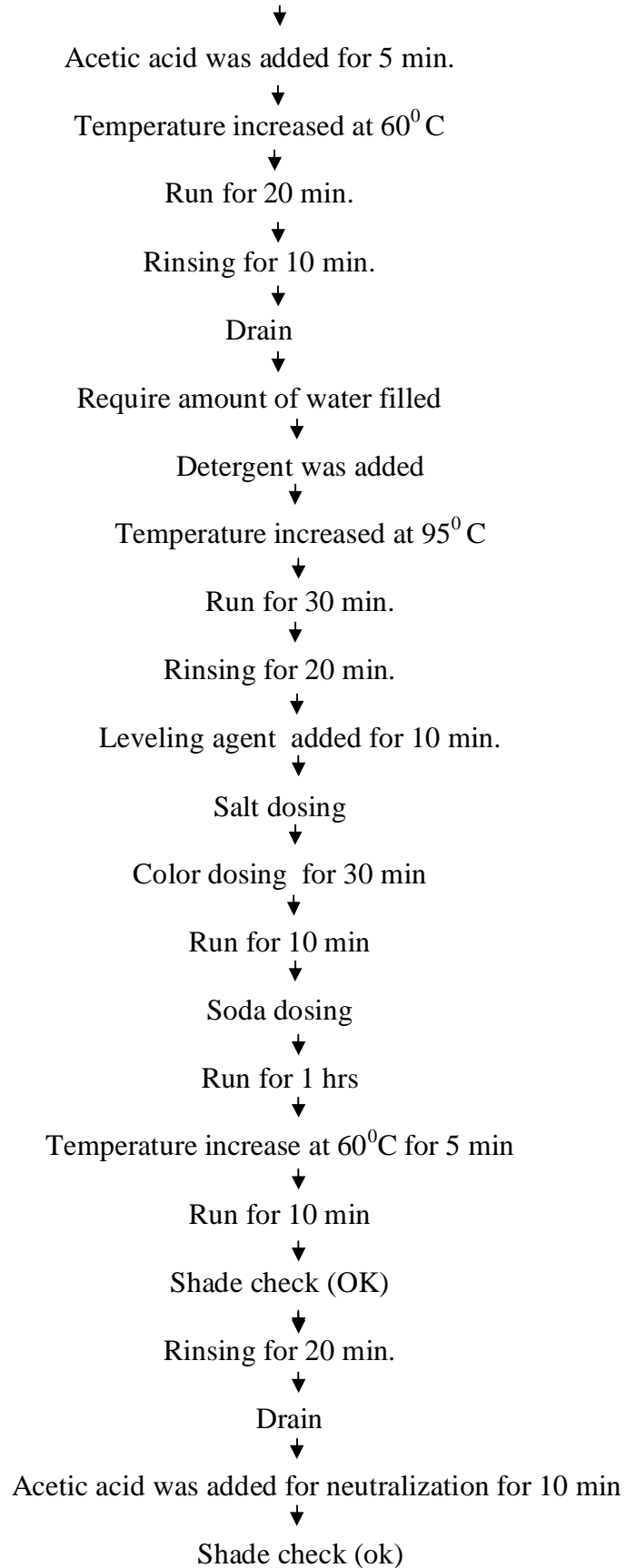
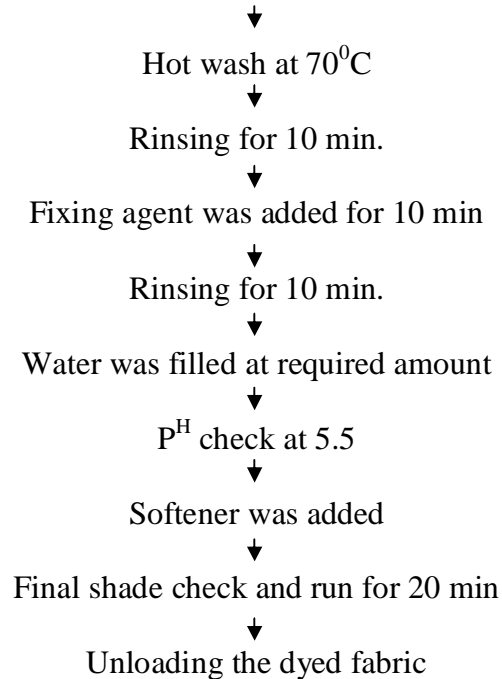


Figure: Dyeing Curve of Polyester/cotton blend.

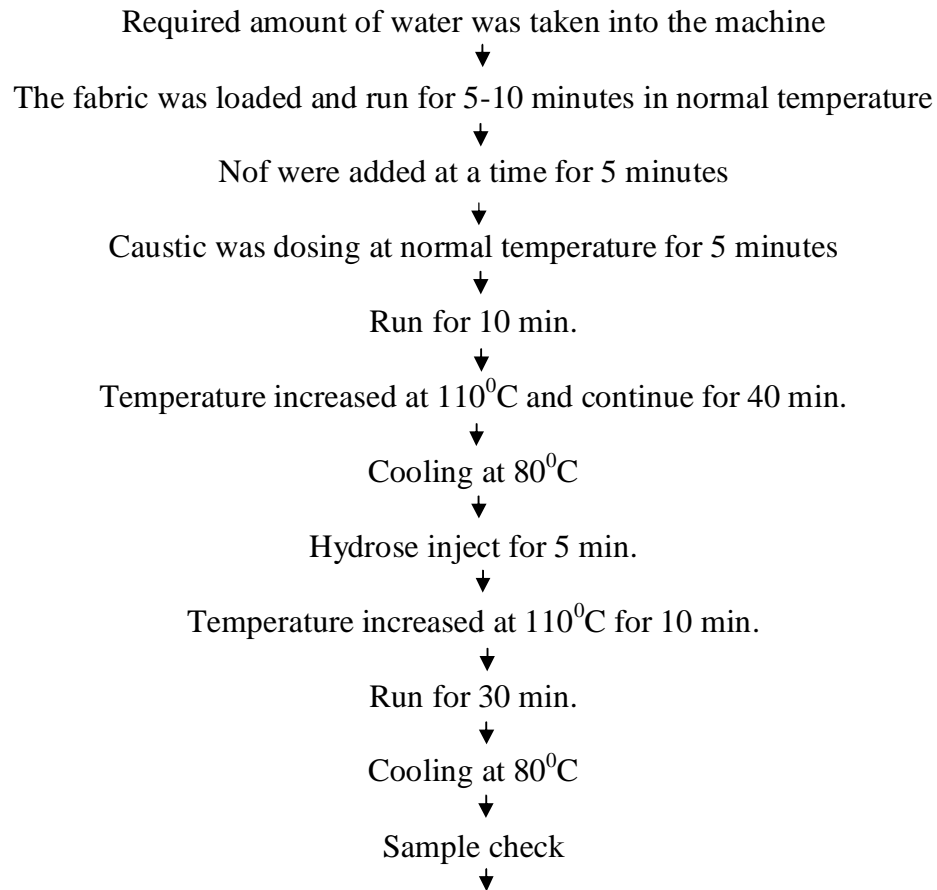
4.13 Process sequence of topping:







4.14 Process sequence of stripping:



Rinsing for 15 min.



Hot wash



Cold Wash



Unload the Fabric

4.15 Process sequence of Removal Softener spot:

Required amount of water filled



Fabric was loaded and run for 10 min.



Drain



Required amount of water filled



Acetic acid was added for 5 min.



2UD added for 5 min.



Run for 10 min. at 70⁰ C



Rinse for 15 min.



Drain



Required amount of water filled



Acetic acid added for P^H- controlled



Check P^H at 4.5



BT-2(enzyme) added



Run for 1 hrs



Shade check



Rinsing for 10 min.

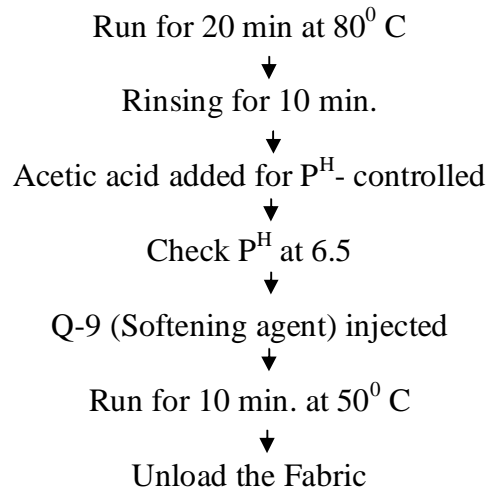


Anti-crease (C2G) was added for 5 min.



Leveling agent (CL225) added for 5 min.





4.16 Common faults and their remedies in knit dyeing:

1. Crack, rope & crease marks:

Causes:

- ❖ Poor opening of the fabric rope
- ❖ Shock cooling of synthetic material
- ❖ Incorrect process procedure
- ❖ Higher fabric speed

Remedies:

- ❖ Pre-Heat setting
- ❖ Lower rate rising and cooling the temperature
- ❖ Reducing the m/c load
- ❖ Higher liquor ratio
- ❖ Running at a slightly higher nozzle pressure

2. Fabric distortion and increase in width:

Causes:

- ❖ Too high material speed
- ❖ Low liquor ratio

Remedies:

- ❖ By decreasing both nozzle pressure & winch speed

3. Pilling:

Causes:

- ❖ Too high mechanical stress on the surface of the fabric
- ❖ Excess speed during processing
- ❖ Excess foam formation in the dye bath

Remedies:

- ❖ By using of a suitable chemical lubricant

- ❖ By using antifoaming agent
- ❖ By turn reversing the Fabric before dyein

4. Running problem:

A. Ballooning:

Causes:

- ❖ Seam joining with too densely sewn

Remedies:

- ❖ By cutting a vertical slit of 10-15 cm in length for escaping the air.

B. Intensive foaming:

Causes:

- ❖ Pumping a mixture of air and water

Remedies:

- ❖ By using antifoaming agent

5. Uneven dyeing:

Causes:

- ❖ Uneven pretreatment (uneven scouring, bleaching & mercerizing)
- ❖ Uneven heat-setting in case of synthetic fibres
- ❖ Quick addition of dyes and chemicals
- ❖ Lack of control of dyeing m/c

Remedies:

- ❖ By ensuring even pretreatment
- ❖ By ensuring even heat-setting in case of synthetic fibers
- ❖ By slow addition of dyes and chemicals
- ❖ Proper controlling of dyeing m/c

6. Shade variation (Batch to batch):

Batch to batch shade variation is common in exhaust dyeing which is not completely avoidable. Even though, to ensure a consistent batch to batch production of shade the following matters should be controlled carefully-

- ❖ Use standard dyes and chemicals
- ❖ Maintain the same liquor ratio
- ❖ Follow the standard pretreatment procedure
- ❖ Maintain the same dyeing cycle
- ❖ Identical dyeing procedure should be followed for the same depth of the shade
- ❖ Make sure that the operators add the right bulk chemicals at the same time and temperature in the process.
- ❖ The Ph, hardness and sodium carbonate content of supply water should check daily.

7. Dye spot:

Causes:

- ❖ Improper mixing of dyestuff in the solution, in right amount of water, at the temperature.

Remedies:

- ❖ We should pass the dissolved dyestuff through a fine stainless steel mesh strainer when adding it to the chemical tank, so that the large un-dissolved particles are removed.

8. Patchy dyeing:**Causes:**

- ❖ Uneven heat in the machine.
- ❖ Improper impregnation of dye liquor due to the low wetting property of the fabric.
- ❖ Dye migration during intermediate dyeing.

Remedies:

- ❖ By proper pretreatment.
- ❖ By adding extra wetting agent.
- ❖ Heat should be same throughout the dye liquor.

9. Specky dyeing:**Causes:**

- ❖ Excessive foam in the dye bath.
- ❖ Fall of water droplets on fabric surface before or after dyeing.
- ❖ In sufficient after treatment.

Remedies:

- ❖ By using antifoaming agent.
- ❖ Sufficient after treatment.
- ❖ By using a good wetting agent in the dye bath.

10. Roll to roll variation or Meter to Meter variation:**Causes:**

- ❖ Poor migration property of dyes.
- ❖ Improper dyes solubility.
- ❖ Hardness of water.
- ❖ Faulty m/c speed, etc

Remedies:

- ❖ Use standard dyes and chemicals.
- ❖ Proper m/c speed.
- ❖ Use of soft water

11. Crease mark:**Causes:**

- ❖ Poor opening of the fabric rope
- ❖ Shock cooling of synthetic material
- ❖ If pump pressure & reel speed is not equal
- ❖ Due to high speed m/c running

Remedies:

- ❖ Maintaining proper reel speed & pump speed.
- ❖ Lower rate rising and cooling the temperature
- ❖ Reducing the m/c load
- ❖ Higher liquor ratio

12. Dye spot:**Causes:**

- ❖ Improper Dissolving of dye particle in bath.
- ❖ Improper Dissolving of caustic soda particle in bath.

Remedies:

- ❖ By proper dissolving of dyes & chemicals
- ❖ By passing the dissolved dyestuff through a fine stainless steel mesh strainer, so that the large un-dissolved particles are removed

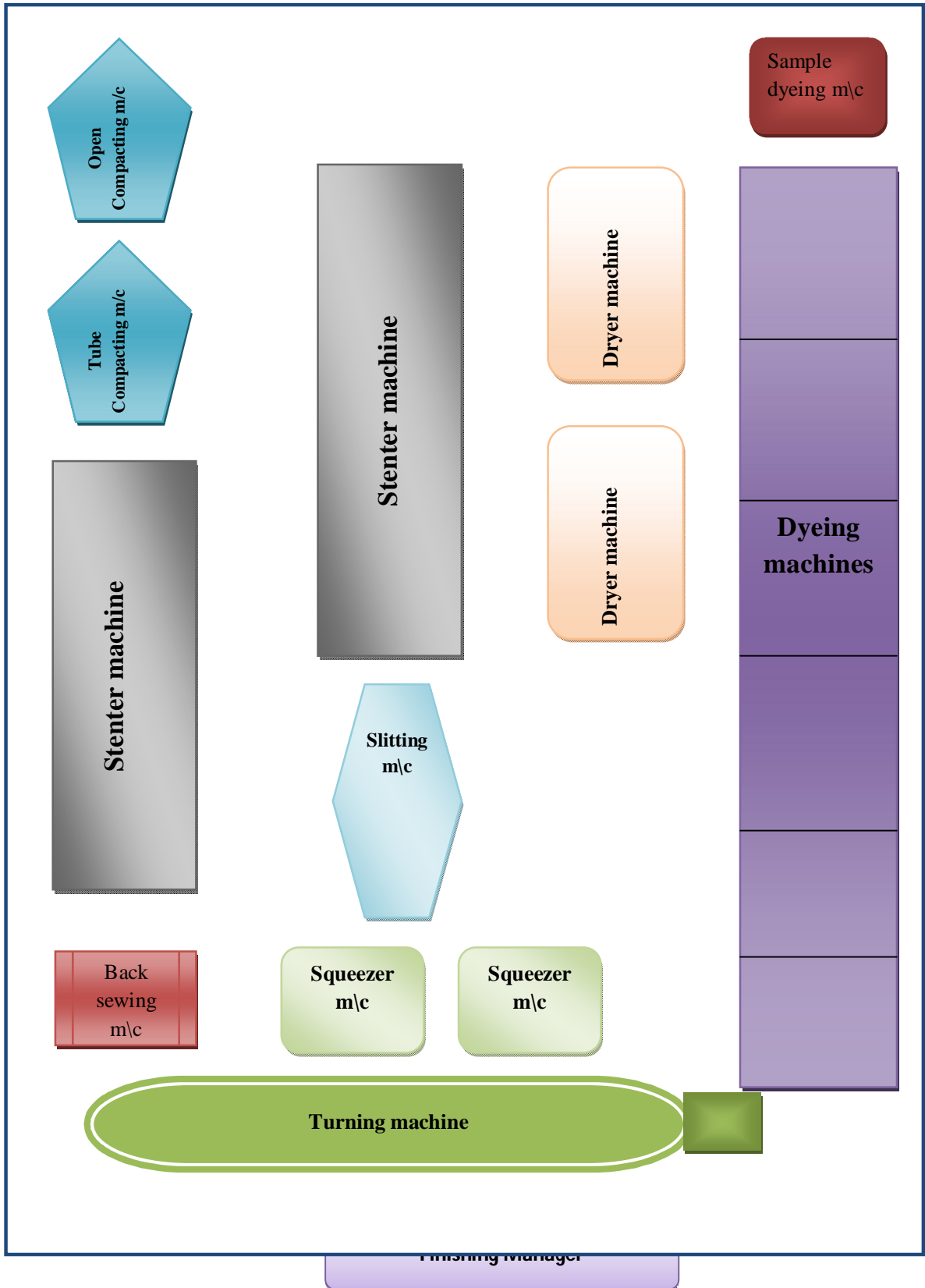
13. Softener Mark:**Causes:**

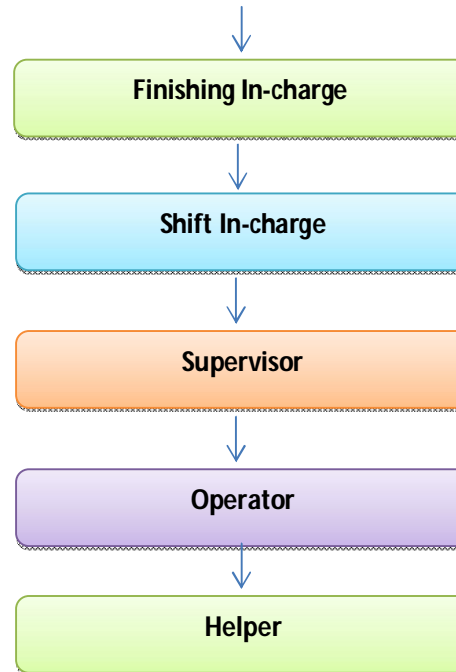
- ❖ Improper mixing of the Softener.
- ❖ Improper running time of the fabric during application of softener.
- ❖ Entanglement of the fabric during application of softener

4.17 Photo Gallery



5.1 Layout of Finishing Section:





5.2 Machine description of finishing section:

S/L	Machinery	No. of machine	Brand	Origin
1	Fabric Reversing M/C	01	MERSAN	Turkey
2	Scutcher M/C	02	SANTEX	Switzerland
3	Dryer M/C	01	SANTEX	Switzerland
4	Dryer M/C	01	HELINT	Switzerland
5	Calendering M/C	01	FERRARO	Italy
6	Slitting M/C	01	SANTEX	Switzerland
8	Stenter M/C	01	BRUCKNER	Italy
9	Back sewing M/C	01	HSING CHENG	Taiwan
10	Dryer M/C	01	SANTEX	Switzerland
11	Hydroextractor	01		
12	Tumble dryer	01		
13	Tumble Dryer	01		

5.3 Different types of machine with their function:

Machine No:01

Name: Wet Fabric Reversing Machine

Function:

- ❖ Turn tube fabric face side to back side or back side to face side to remove loosen fibers.

Details	
Brand	Mersan
Serial No	13200909
Electric Power	2KW
Weight	650 Kg
Origin	Turkey

Machine No: 02

Name: Scutcher Machine

Function:

- ❖ Clean the fabric.
- ❖ Increases the softness of fabric.
- ❖ Remove water through squeezing.
- ❖ Dewatering, softener application and overstretching.

Details	
Brand	Santex
Type	SANTASTRETCH PLUS 120
ELECTR. DIAGR.NR:	94-3540
Working Speed	0-80m/min
Working Widths	100-240cm
Electric Power Supply	4-8KW
Year of construction	1994
Origin	Switzerland

Machine No: 03

Name: Scutcher machine.

Function:

- ❖ Clean the fabric
- ❖ Increases the softness of fabric.
- ❖ Remove water through squeezing.



- ❖ Dewatering, softener application and overstretching.

Details	
Brand	Santex
Type	Santastretch Plus
ELECTR. DIAGR.NR:	01-5552
Electric Voltage	3*380 volt+PEN 220 V/50Hz
Connected Load	20 Kw
Year of construction	2002
Origin	Switzerland

Machine No: 04

Name: Dryer Machine

Function:

- ❖ To dry the fabric.
- ❖ To control the overfeed system.
- ❖ To control the vibration which increase the G.S.M.
- ❖ Tensionless drying, shrinking and relaxing for knitted and woven fabrics.

Details	
Brand	Santex
Model	CH-9555 Tobel
Working Width	60-420cm
Evaporation Capacity	320 Kg/h
Machine Speed	5-80m/min
Electr. Diagr.Nr	93-3541
Electric Voltage	3*388 volt+N+E220V,50 Hz
Connected Load	60 Kw
Year of Manufacturing	1994



Machine: 05

Name: Dryer

Function:

- ❖ To dry the fabric.
- ❖ To control the overfeed system.
- ❖ To control the vibration which increase the G.S.M.

Details	
Brand	Helint
Model	CH-9555 Tobel
Type	ONDLLOMAX 3.3.2GAZ
Connected Load	60 Kw
Year of Manufacturing	1994

Machine No: 06**Name: Dryer machine(Tube)****Function:**

- ❖ To dry the fabric.
- ❖ To control the overfeed system.
- ❖ To control the vibration which increase the G.S.M.
- ❖ Steaming and Compacting of tubular fabrics.
- ❖

Details	
Brand	Santex
Model	CH-9555 Tobel
Type	Santaspread 120
Working Width	100-180cm
Working Speed	5-50m/min
Electr. Diagr.Nr	93-3542
Electric Voltage	3*388 volt+N+E230V,50 Hz
Connected Load	8 Kw
Year of Manufacturing	1994

Machine No: 07**Name: Calendaring Machine**

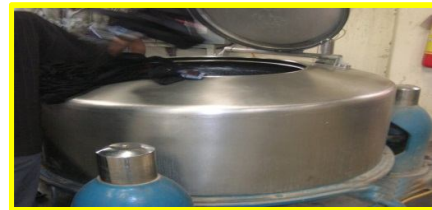
Function:

- ❖ Removing shrinkage of fabric.
- ❖ Control dia of fabric.

Details	
Brand	Ferraro
Connected Load	10 Kw
Year of Manufacturing	2006
Origin	Italy

Machine No: 08
Name: Hydro Extractor
Function:

- ❖ To extract excess water.



Details	
Brand	Dilmenler
Capacity	125 Kg
Extraction %	80
Origin	Turkey
Time	5-10 mins

Machine No: 08
Name: Slitting machine.
Function:

- ❖ To open tube fabric according to specific needle mark.
- ❖ Slitting of tubular fabrics



Details	
Brand	Santex
Model	CH-9555 Tobel
Electr.diagr.Nr	01-5553
Working Width	2400mm

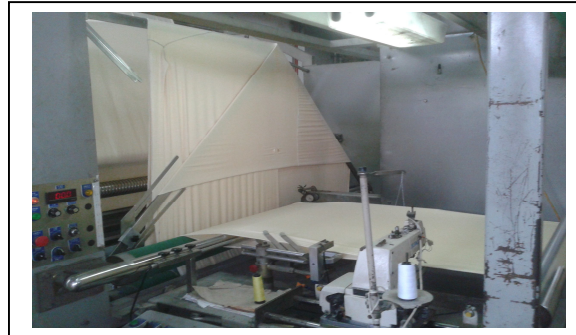
Electric Voltage	3* 380 V+PE 220 V/50 Hz
Connected Load	21 Kw
Year of Manufacturing	2002

Machine No: 09

Name: Back Sewing Machine

Function:

- ❖ To removing side dull.



Details	
Brand	Hsing Cheng
Model	HC-AEN-2600mm-A12797
Year of Manufacturing	2005
Origin	Taiwan

Machine No: 10

Name: Stenter Machine

Function:

- ❖ GSM of the fabric is controlled by stenter.
- ❖ Spirality controlled by the stenter.
- ❖ Moisture of the fabric is controlled by the stenter.
- ❖ Loop of the knit fabric is controlled by the stenter.
- ❖ Finishing chemicals apply on the fabric by the stenter.
- ❖ Width of the fabric is controlled by the stenter.
- ❖ Heat setting is done by the stenter for lycra fabric, synthetic and blended fabric.
- ❖ Fabric is dried by the stenter.
- ❖ Shrinkage property of the fabric is controlled by the stenter.



Details	
Brand	Bruckner
Serial No	72276-0463
Temperature Range	50-250°C
Max Speed	120 (m/min)
Production Capacity	8 ton/day
No of Chamber	3
Max. Fabric Width	102''
Minimum Fabric Width	30''
Steam Pressure	2 bar
Air pressure	10 bar
No of rotamatic burner	6
Extra Attachment	Mahlo weft straightener
Year of Manufacturing	2002
Origin	Germany

Machine No: 11

Name: Calendaring Machine

Function:

- ❖ Removing shrinkage.
- ❖ Increase smoothness.
- ❖



Details	
Brand	Santex
Model	CKN/280
Year of Manufacturing	2002
Origin	Italy

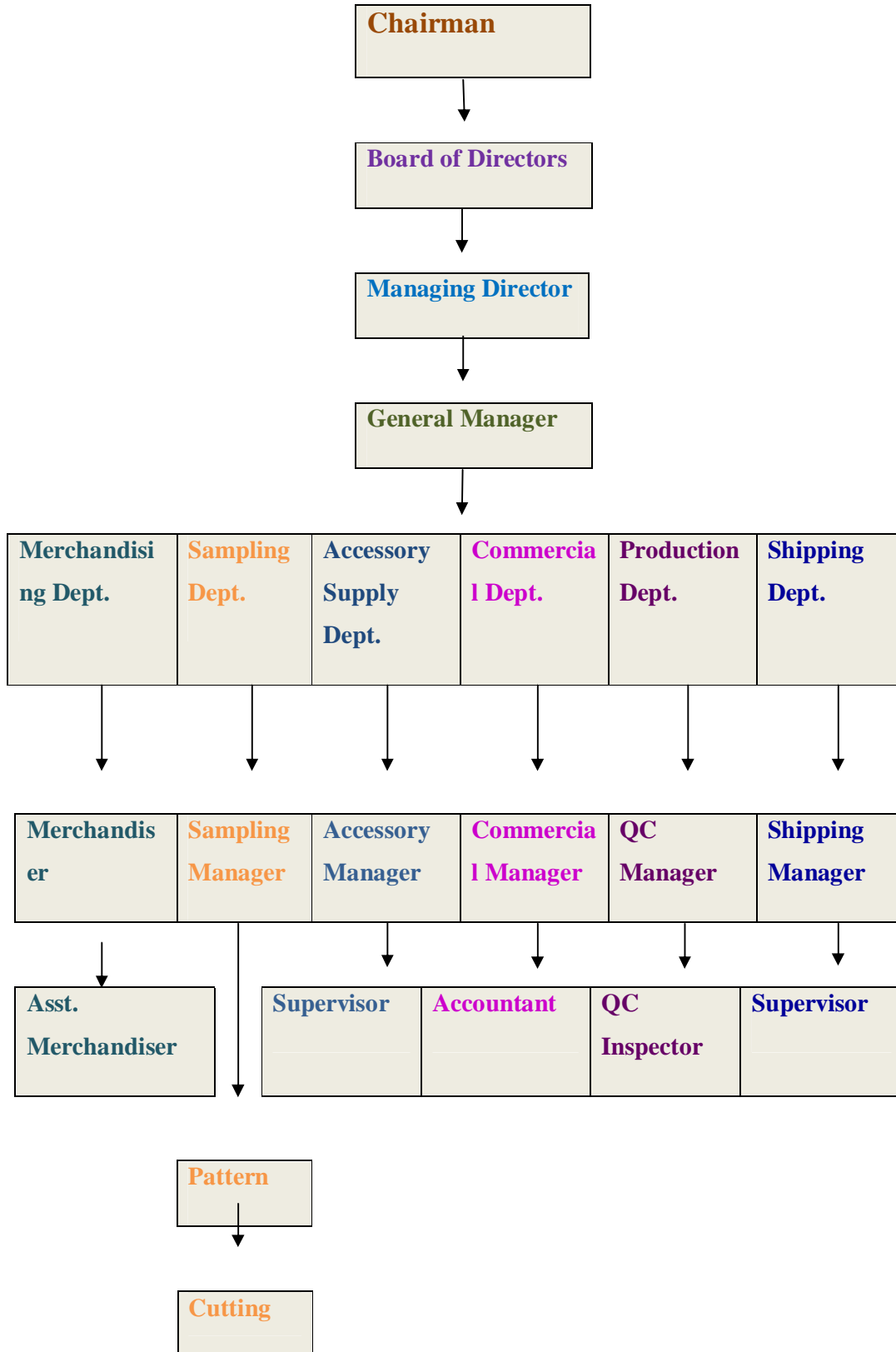
5.4 Finished Fabric Inspection:

The following defects are found in the final inspection.

1. Uneven shade
2. Oil spot
3. Naps

4. Crease mark
5. Machine Stoppage mark
6. Listing
7. Line mark
8. Pick missing
9. Double yarn
10. Dead cotton
11. Bowing
12. Fly yarn contamination

6.1 MANAGERIAL PERSONNEL OF GARMENTS UNIT



6.2 MANPOWER IN GARMENTS UNIT:

- Office Staff = 26
- House keeping = 17
- Finishing = 41
- Quality = 34
- Cutting = 30
- Sewing Operator = 103
- Sewing assistant operator = 117
- Total = 368

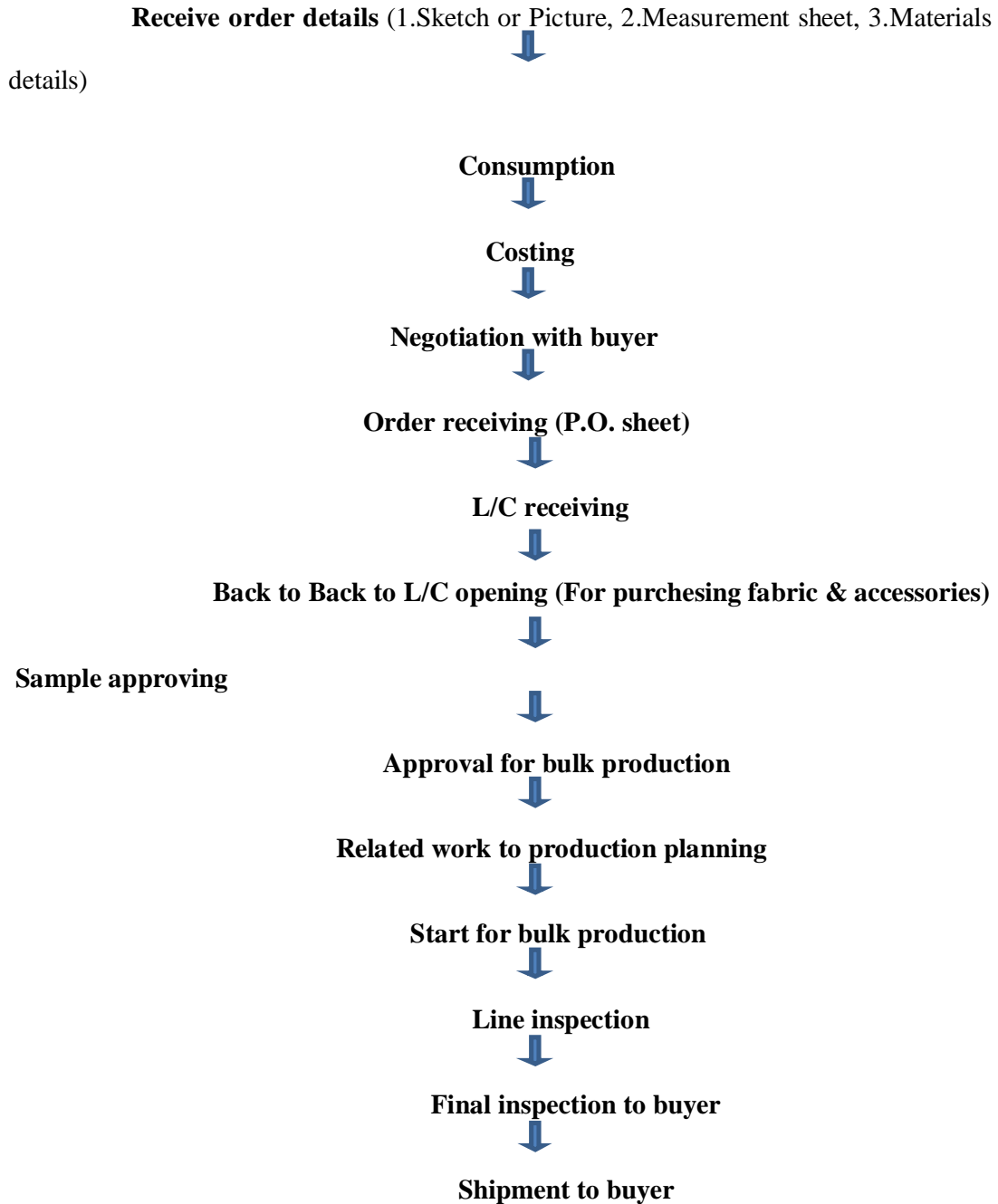
6.3 CONCEPT OF MERCHANDISING

Merchandising is the department which mediates marketing and production departments. It is the methods, practices, and operations used to promote and sustain certain categories of commercial activity. It includes directing and overseeing the development of product line from start to finish. Marketing and merchandising department: A team of merchandisers and marketers work together under a profit controls head. Merchandisers handle the foreign buyers. The teams are made according to the buyers being handled.

6.4 MERCHANDISER

The person who is related in merchandising is called merchandiser. The merchandiser coordinates with the design team to effectively present the product or product line. He or she develops colors and specifications, and performs market research to determine the most effective ways to sell and promote the product. This person needs strong communication and negotiation skills and visual and analytical abilities. He or she also needs to be a creative and innovative thinker.

6.5 PROCESS FLOW CHART OF MERCHANDISING



6.6 CHRONOLOGICAL PROCESS OF MERCHANDISING

Step 1: Marketing:

Marketing personnel has to market his company in order to increase his customers and generate more and more revenue. : It acts as a bridge between buyer and the company for communication. The Marketing personnel here enclose a brochure and product picture with the mail and forward it to the prospective buyer for their convenience. The interested buyers reply to the enquiry letter submitting a sample product or sketch with measurement sheet to the merchandiser to follow the sample to go for production.

Step 2: Costing and Negotiations:

Costing:

Merchandise makes a cost sheet to see if the product is feasible or not in terms of cost and revenue. Merchandiser has to calculate the cost of products including all wastes and accessories to tell the final cost of the product to his customers.

Negotiation:

Merchandiser must have a negotiating power on the price to convince his buyers on specific price to lessen the chances of loss. If price is negotiated then it's time to sample approval from buyer.

The aim of negotiation/approach

"Win Win solution" Both parties are benefited.

The skill for negotiation:

- Discovering common interest and removal of personal issues.
- Questioning skill
- Listening effectively
- Understanding body language.
- Observation and judgment.
- Influencing skills

Step 3: Source Fabric:

After negotiation the merchandiser have to find from where fabric can be found as per buyers requirement. There are two sources of fabric. 1. Local source 2. Foreign Source. Both local and foreign it needs to open a L/C. In textile sector generally back-to- back L/C is used to collect Fabrics.

Step 4: Prepare Lab Dipping, Dyeing and Fabric printing:

It is an important part of sampling. If buyer wants color size product then he need to send them for proper coloring. After that lab test is send to the buyer for approve. For an example Letter that is send to lab is given below:

Date:

To

Mr. Babul

Knit Concern Ltd.

Sub: Lab Dip Programmed

Buyer Name: Info-united

Art:-Zob-3

Fabrics- 65% Cotton, 35% Polyester, S/J 180 GSM

SL #

Color Name

Pantone/Shade

Fabrics

Remarks

01

Orange

158 C

Gets approval Lab Dipping?

Lab Dip confirmation & may be fitting & workmanship changes:

Start with dyeing the fabric (if necessary start tests bulk)

2. Sending preproduction samples or size set in original fabric with all already Confirmed details.

Dyeing: After the buyer approves lab test, and then sample is sent for dyeing.

Fabric Printing: Fabric printing is the process that applies a single or multi Colored/design on a white or dyed background fabric, using textile dyes. If there is any need for print, and then it is sent for printing.

Step 5: Source Prepare Trims & Accessories:

For preparing a product a company needs various types of trims and accessories. These are very much important for textile products. Such as tag, pin, scope tape etc. so it is the duty of a merchandiser to source accessories before starting production.

Step 6: Develop a Sample:

Sample is the physical form of buyer's specification or style/design.

After drawing a sketch a sample is prepared for the buyers and sent to the buyers. Sampling may be in two ways. 1. Sampling after confirmation price. 2. Sampling before confirmation price. For sampling a merchandiser needs fabrics, yarn, level, etc.

Types of sample/Stages of sample:

➤ **Proto Type Sample:**

This is the first sample given to the buyer. The sample is prepared according to the requirement of the buyer and this is the rough sample. The range of sample is about 1-2 to vary according to the requirement of the buyer.

Comments on Proto Type:

Buyer gives his comments on sample and also recommends the changes in sample.

➤ **Counter Proto Sample:**

This sample is based on the comments received from the buyer. For this sample, 2-3 pieces are required.

➤ **Salesman Sample:**

Buyer sends the samples in market by salesman to get market feedback from customers. It is done on 250-500 pieces or may exceed depending on season and customer. Buyer has to sell these garments to check and view.

- ✓ Samples
- ✓ Market

- ✓ Feedback
- ✓ Buyer's Design
- ✓ Buyer's Merchandisers
- ✓ Manufacturer's Merchandiser

Comments on Salesman Sample:

Feedback on sample from customer is send to merchandiser/ manufacturer.

➤ **Pre-Production Sample (PPS):**

Manufacturer prepares it. All changes are confirmed on it. 2-3 pieces are required in pre-production sample.

Approval of PPS:

It is the stage where a sample may be approved or rejected. If accepted go ahead to next step and if rejected then there will be the process of revision of previous steps. PPC department is also involved at this stage. Once PPC is involved, no change in styling is acceptable.

➤ **Size Set Sample:**

2-3 sets of different size are sending to PPC (planning production and control). Manufacturer keeps one sample himself and one sends to buyer for cutting approval. Its purpose is that buyer will make no change in cutting details. If he makes some changes, he himself will be responsible for any loss/ damage.

➤ **Fit Sample:**

No change in stitching is acceptable at this stage. 2-3 garments are used in fit sampling.

➤ **Photo Shoot Sample:**

Now the sample is ready for shipment. Buyer picks some pieces randomly to test its gauge, GSM, shrinkage. If all these are according to the requirement of buyer then shipment is said to be ok. 15-20 pieces are picked up as a sample to test.

➤ **Shipment Sample:**

This stage is the completion of total order. And the garments are sending to shipment.

Step 7: Production execution and tracking:

➤ **Cutting the Fabrics:**

After confirmation of production and approve of the cutting the fabrics from the buyer, the cutting master started to cut the fabrics.

➤ **Sewing:**

In swing section the finish fabrics are sewing. There are various types of sewing machine that are given in the list of machineries.

➤ **Washing:**

It is most important factor in textile sector. In different stages of production, various spot we found in products that are needed to wash. Various spot we found in products that are given below:

- ✓ Oil spot
- ✓ Dirt spot
- ✓ Print spot
- ✓ Fabrics spot

➤ **Ironing:**

In iron section products are ironed for better finishing. Ironing product looks nice and shines. For iron generally steam boiler is used. Steam boiler is so much useful for iron. Sometimes iron shoes are used in iron for better ironing.

➤ **Packaging:**

Packaging may be defined as the activities of designing and producing the container or the wrapper for the product. Generally the packaging could be considered as the silent sells man of the product. When the garments are exported to the prospective buyer different type of instruction should have to be followed by manufacturers. Basically the clothing manufacturer is using three kinds of packages.

Primary Packages:

Insertion a garment into a poly bag is considered as the primary package of garments. Full visibility makes the customer to identify the color, size and style etc.

Secondary package:

Secondary package of a garment could be another poly bag or inner carton. Inner carton or master poly bag containing a number of garments, provide traditional quotation and make opportunities for sales promotion. This container facility of pack number of

garment pertains to packing instruction given by the buyer. There are four packing strategies:

✓ Solid Color Solid Size:

All garments are of same size and color. e.g

Garments = 42

Color = Red, Size = Small

✓ Solid Color Assorted Size:

According to this strategy color of all pieces is same while there is variation in size e.g.

Garments = 42

Color = red

Size = Small, Medium, and long with ratio 1:2:1.

✓ Assorted Color Solid Size:

In this strategy color of garments is different while size is same.

Garments = 42

Color = Red & Blue

Size = Medium

✓ Assorted Color Assorted Size:

Garments are of different colors and sizes.

Garments = 42

Color = Red & Blue

Size = small & Medium

Shipping Package:

This refers to packaging for necessary for storage identification or Transportation. Cartons are used as shipping package.

✓ The Side Mark:

Carton no., Carton Measurement, Quantity (in pcs), Net weight (Single product). Net weight. (Six pcs product), Gross weight (Full carton).

✓ Main Mark:

Buyer Name. Consignees add. Order no. Style no. Color/size/Breakdown. Destination. Etc.

✓ Carton Measurement:

3 ply (inner). 5ply (how much pcs), 7ply

✓ Ensure Quality:

Quality is the most important factor in textile sector. Buyers always emphasis on quality. So it is needed to care always on quality. A quality product always turns more buyers.

➤ **Arrange Shipping Sample:**

Shipping sample is very important for shipment. Shipping sample means the representative of the product that we produced for the buyer. Sample must be repetitive according to color, size.

✓ Follow- up Export Procedures:

A merchandiser must follow the export procedures by himself.

✚ **Step 8: Export procedure:**

Cargo lifting advice is fixed to custom clearing agent/ Forwarder/ Transportation. Forwarder / clearing agent make arrangements for the custom clearance and booking of the space at earliest vessel. Following documents are required for the custom clearance. Detail is given following;

- **Invoice:** In Invoice following criteria is required.
 - ✓ Consignee and Applicant Addresses
 - ✓ Garment Description
 - ✓ Garment Price and Total Invoice value
 - ✓ Net and Gross Weight of Garments
 - ✓ PO (purchase order) no.
 - ✓ Freight Terms.
 - ✓ From # & Date
 - ✓ L/C. # (letter of credit)

- **Packing list:** There are following details in the packing list required as per buyer's instruction or mentioned in L/C.
 - ✓ Consignee and applicant addresses
 - ✓ Product description
 - ✓ Garment Style and color
 - ✓ Net and Gross weight of Garments
 - ✓ No. Of Pieces in the Carton and Carton Dimension also other necessary information, which gives help for the custom clearance.
 - ✓

- **Export-from:**
 - ✓ E-FORM is issued and attested by the concerned bank (Islami bank Bangladesh ltd.)

- **Bill of entry:**
 - ✓ Applicable only in case of the imported material used in the manufacturing of the garments for the export purposes.

- **Shipping bill:**
 - ✓ The forwarder prepares shipping bill. After the sub Management Information Systems ion of the custom docs, by the forwarder, custom authorities check the docs. And examine the shipment accordingly. They write the report on the backside of the shipping bill and allow the shipment for the export from Bangladesh. All these docs are then returned to the export department.

- **Visa process:**
 - ✓ After receiving the Docs from the forwarder, Export Department prepares the Visa docs, which are required for the export of garment to the following countries; USA, CANADA, EUROPEAN countries.

- **Negotiation / Collection:**
 - ✓ After the completion of the Visa process, we submit the docs in the Bank for the negotiation/ collection. The docs are prepared according to the L/C. or the buyer requirement.

- **Document for the buyer:**
 - ✓ Export department also prepare documents for the buyer for the custom clearance of the shipment at the destination.

- **Payment procedure:**
 - ✓ After the negotiation/ collection procedure of the docs, bank dispatches the same to L/C opening bank, to realize the payment. Foreign bank is bound to realize the same within the 10 to 15 days.

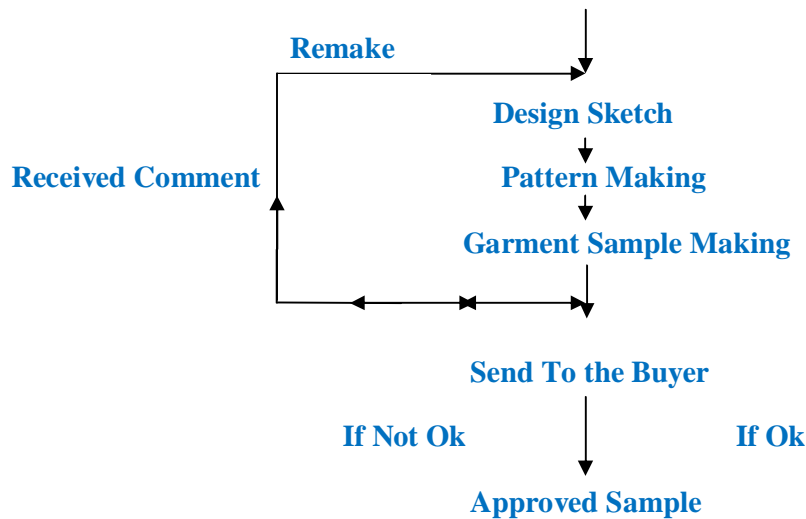
- **Commercial invoice:**
 - ✓ In the commercial invoice all the details are mentioned required under conditions of L/C for the custom clearance and other necessary purposes.

- **Packing list:**
 - ✓ It consists of color, weight, product code/other, coding numbers, no. of cartons, carton dimension, and carton packing.

- **Bill of lading / Airway:**
- ✓ This is according to the L/C terms and conditions.

6.7 DEVELOPMENT OF SAMPLE

Measurement Chart



6.8 TYPES OF SAMPLE

➤ **Fit Sample:**

The sample which is made by the following only the measurement chart. Then the sample we gate is called fit sample.

➤ **Photo type Sample:**

Actual fabric and the accessories used to make this fabrics then it is send to the buyer. It is only one size Like “M”.

➤ **Size Set Sample:**

When all size of sample are included in a set those sample is called is size set sample.

➤ **Production Sample:**

During production some of the sample garments collecting from the production line then send to the buyer these are called production sample.

➤ **Shipping Sample:**

After final inspection, when shipment the goods to the buyer destination some sample should be send to buyer air advanced this sample are called shipment sample.

➤ **Approved Sample:**

The sample which is approved by buyer.



Fig: Sample Section

6.9 MARKER MAKING

Marker is a thin paper which contains all the pattern pieces of a garment. It is made just before cutting and its purpose is to minimize the wastages. The width of a marker is equal to the width of the fabric and it should not be greater than the width of the fabric i.e. the width of the marker is kept less than or equal to the width of the Fabric.

The pattern pieces should be placed very carefully in such a way that it will obviously minimize wastages.

6.9.1 OBJECTIVES OF MARKER MAKING

- To reduce cost;
- To improve the quality of the garments
- To reduce the cutting time;
- To facilitate large scale production.

6.9.2 GOOD MARKER PLAN DEPENDS ON

- Skilliness of marker man or operator,
- Fabric length and width; if fabric length or table length is high marker efficiency is also high,
- Type of garments,
- Garments design,
- Attentiveness of marker man or operator,
- Fabric characteristic,
- Quality of garments etc.
- So, good marker plan minimize the wastage of fabric. Therefore, good marker plan is very important.

6.9.3 CONSIDERABLE POINTS BEFORE MARKER MAKING:

- Fabric width (1/2) higher than marker width
- Fabric length higher than marker length (1" + 1")
- The grain line should be parallel to the line of Wales in knit fabrics.
- All the pattern pieces of garments should be along the same direction when laid on an asymmetric fabric.
- Considered garments production planning.

6.9.4 FACTOES RELATED TO MARKER EFFICIENCY:

- Marker planer
- Size of garments
- Marker length
- Pattern engineering
- Fabric Characteristics
- Marker making method
- Marker width.

6.9.5 MARKER EFFICIENCY

Marker efficiency means the ratio of the all pattern on the marker paper to total area of the marker and it is expressed as percentage (%) is called marker efficiency.

All pattern on the marker

Marker Efficiency = $\frac{\text{All pattern on the marker}}{\text{Total area of the marker}} \times 100\%$

Total area of the marker

If marker efficiency is more then fabric wastage % is low.

If marker efficiency is law then fabric wastage % is more.

6.9.6 FACTORS AFFECTING MARKER EFFICIENCY

- Manufacturers of the marker;
- Size of pattern pieces;
- Length of the marker;
- Pattern Engineering;
- Nature of the fabric;
- Method of marker making;
- Marker width;



Fig: Marker on fabric

6.10 FABRIC SPREADING

Spreading is the process of superimposing lengths of fabric on a spreading table or cutting table or specially designed surface in preparation for the cutting process.



Fig: Fabric Spreading

6.10.1 EQUIPEMENT OF FABRIC SPREADING

Spreading equipment consists of:

- Spreading surface.
- Spreading machines.
- Fabric controlling device.
- Fabric cutting devices.

6.10.2 OBJECTS OF FABRIC SPREADING

- To place the number of plies of fabric to the length of the marker plan correctly aligned as to length and with and without tension.
- To cut the garments in bulk and saving in cutting time per garment that result from cutting many plies at the same time.

6.10.3 TYPES OF SPREADING

There are two types of spreading

- Flat spreading.
- Stepped spreading.

6.10.4 METHOD OF SPREADING

- Manual method.
- Mechanical method.
 - ✓ Semi automatic.
 - ✓ Full automatic.

6.10.5 REQUIREMENTS OF SPREADING

- Alignment of fabric ply.
- Correct ply tension
- Fabric must be flat.
- Elimination of fabric flaws.
- Correct ply direction and stability.
- Elimination of static electricity.
- Matching checks and stripes.
- Easy separation of cut lay into bundles.
- Avoidance of fusion of plies during cutting.
- Avoidance of dist

6.11 FABRIC CUTTING

Fabric cutting means to cut the garments pieces from lays of fabric with the help of cutting template or marker. To make a complete garments, cutting is necessary. Generally the marker is applied to the top ply of a lay. The use of the term cutting can present a

difficulty. It is used in the sense of cutting room, an area which normally includes the activities of marker planning, spreading and preparation for sewing.

6.11.1 OBJECTS OF CUTTING

The object of cutting is to separate fabric parts from the spread of lay according to the dimension of the marker for the purpose of garments making according to the pattern pieces.

6.11.2 REQUIREMENTS OF FABRIC CUTTING

The objective of cutting is to separate fabric parts as replicas of the pieces in the marker plan. Achieving this objective, certain requirements must be fulfilled.

- Precision of cut.
- Clean edges.
- Unscathed, infused edges.
- Support of the lay
- Consistent cutting

6.11.3 METHODS OF CUTTING

There are mainly three methods of cutting. They are

- Completely by manual i.e Hand operated scissor.
- Manually operated powered knife.
 - ✓ Straight Knife
 - ✓ Band Knife
 - ✓ Round Knife
 - ✓ Die Cutter
 - ✓ Notcher

Among these methods, in Hypoid Composite Knit Ltd. one method is used:

- ✓ **Straight Knife Cutter:**

Straight knife cutter: This machine is available for cutting materials like cotton, woolen hemp, silk, chemical fibre, sponge, lather etc. this machine has 8 inch straight knife. Powerful motor can be started by centrifugal switch. It is equipped with automatic knife

grinding device and lubrication system. It has features of stable run, convenient operations and powerful cutting ability.

Working principle of straight knife as cutting accessories:

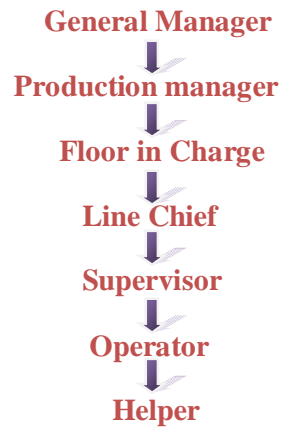
- Firstly, switch on this cutting machine.
- Then , place the cutting machine at any corner of the table
- Then switch on the blade
- Then the operator moves the machine by hand through the stationary fabric layers and cut along marker lines until finish the marker.

Some excellent features of this cutter make this popular to garments industry all over the world. Though now a day many factories are using computerized method for saving manpower and time, also better quality.

6.11.4 SORTING AND BUNDLING

Sorting and bundling is done after cutting . here the fabric parts are separated after cutting according to the roll of fabric and serial number is given with help of labeling machine. It is done so that, during sewing shade variation cannot be occurred. Bundle number is given to all the bundles for better matching the garments parts. For numbering purpose, a labeling machine is used to add sticker on garments. All parts of garments would be given same number so that , during sewing,. Sewing personnel can recognize the individual garment parts easily. This is done for avoiding shade variation or any kind of mass matching.

6.12.1 ORGANORGRAM OF SEWING SECTION



6.12.3 EQUIPMENT

- Plain Machine : 74 set
- 4 Thread Over Lock : 50 set
- 3 Needle Flat Lock : 42 set
- 4 Needle Flat Lock : 03 set
- Auto controlled 1 Needle Lock stitch : 02 set
- Elastic Attaching Machine : 03 set
- Button Attaching Machine : 02 set
- Button Hole machine : 02 set
- Back Top Machine : 08 set
- Bar Tack Machine : 02 set
- 2 Thread Over Edge for Butt and Sewing : 02 set
- Knasai Special : 07 set
- Dino Automatic Rib Cutter : 02 set
- UZU Thread Sucking Machine : 01 set
- Oshima Needle Detector : 01 set
- Oshima Needle Inspection : 01 set
- Heat Transfer Label Attaching Machine : 03 set
- Snap Button Attaching Machine : 02 set
- Viet Steam Iron : 15 set

6.12.4 MACHINES DETAILS IN SEWING UNIT OF BGL

Machine	Brand Name	Origin	Sets	Total Quantity
Plain Machine	Siruba	Japan	24	74
	Juki	Japan	38	
	Sunsir	Japan	12	
Over Lock Machine	Siruba	Japan	5	50
	Juki	Japan	40	
	Yamata	Japan	5	
Flat Lock cylinder Bed	Siruba	Japan	4	20
	Juki	Japan	13	
	Sunsir	Japan	3	
Flat Lock Flat Bed	Siruba	Japan	4	25
	Juki	Japan	14	
	Yamata	Japan	3	
	Gemsey	Japan	4	
Back Tap Machine	Siruba	Japan	3	3
Kansai Special	Kansai	Japan	7	7
Button Attaching Machine	Siruba	Japan	1	2
	Juki	Japan	1	
Button Hole Machine	Juki	Japan	2	2
Snap Button Attaching Machine	GMC	China	3	3
Rib Cutter Machine	DINO	Taiwan	2	2
Bar Tack Machine	Juki	Japan	2	2
Thread Sucking Machine	UZU	Thailand	1	1
Needle Detector Machine	Oshima	Taiwan	1	1

Fabric Inspection Machine	Oshima	Taiwan	1	1
Heat Transfer Label Attaching Machine	Juki		3	3

6.12.5 SEWING PROBLEMS

There are various types of sewing problems found in sewing floor. Among these problems the following are the main –

➤ **Seam pucker:** It is caused for five purposes as follows _

- ✓ Unequal stitch on fabric due to limitation of feed m/c
- ✓ Fabric dimensional stability due to unequal shrinkage of one ply then other for washing
- ✓ Extension of sewing thread due to tension
- ✓ Sewing thread shrinkage after washing or ironing
- ✓ Compact fabric with high EPI, PPI is caused seam puckering during sewing.

➤ **Problem of formation:** It has four types as follows _

✓ **Supplied stitch:**

• Causes:

- Loop size of needle is small
- Bent needle
- Tension variation of looper and needle thread

✓ **Staggered stitch:** (Stitch line is not parallel with seam line)

• Causes:

- Bent needle
- Wrong needle point
- Improper needle adjust

✓ **Unbalanced stitch:** (If bobbin thread does not work, it produces hole & forms this stitch)

• Causes:

- Incorrect tension of sewing thread
 - Incorrect passage of thread through guide
 - Insufficient lubrication
- ✓ **Frequent thread breakage:**
- Causes:
 - Improper unwinding
 - Higher thread tension
 - Excess heating
 - Lower quality thread

6.12.6 SEWING LAY OUT OF A WOMESN T -SHIRT

Join Parts Lay Out	Machine Lay Out
Tape joining	Plain machine
Back piping	Over lock machine
Shoulder joining (one side)	Over lock machine
Shoulder tuck	Plain machine
Neck piping	Flat Lock machine
Neck tuck	Plain machine
Shoulder joining (other side)	Over lock machine
V-Tuck	Plain machine
Chap tuck	Plain machine
Sleeve Joining	Over lock machine
Side joining	Over lock machine
Label joining	Over lock machine

Sleeve joining	Over lock machine
Side joining	Over lock machine
Label joining	Over lock machine
Sleeve hem	Flat lock machine
Bottom hem	Flat lock machine
Tuck stitch	Plain machine
Finished garment	

6.13 QUALITY CONTROL

Quality control is a process employed to ensure a certain level of quality in a product or service. It may include whatever actions a business deems necessary to provide for the control and verification of certain characteristics of a product or service. The basic goal of quality control is to ensure that the products, services, or processes provided meet specific requirements and are dependable, satisfactory.

Essentially quality control involves the examination of a product, service, or process for certain minimum levels of quality. The goal of a quality team is to identify products or services that do not meet a company's specified standards of quality. If a problem is identified, the job of a quality control team or professional may involve stopping production temporarily. Depending on the particular service or product, as well as the type of problem identified, production or implementation may not cease entirely.



6.13.1 OBJECTS OF QUALITY CONTROL

- Research
- Selection of raw materials
- Process control
- Process development
- Product testing
- Specification test

6.13.2 QUALITY MANAGEMENT SYSTEM IN BGL

There are two types of online quality control. These are as follows:-

➤ **Raw material control:**

Raw material control means control the quality of raw materials (e.g. - quality of grey fabric, dyes chemicals and auxiliary)

➤ **Process control:**

Process control means the selection of right process and controlling of some parameters. Such as pH, water hardness, water volume, temperature, reels speed. Pump pressure etc.

On-line Tests:

- ✓ Dyed fabric
- ✓ Shade check
- ✓ Wash fastness
- ✓ Water fastness

Off- line tests:

Off line tests for finished fabrics are divided into two groups. These are as follows:

- ✓ Physical tests
- ✓ Chemical tests

Physical tests:

- ✓ GSM of fabric
- ✓ Abrasion resistance/pilling
- ✓ Dimensional stability
- ✓ Spirality test
- ✓ Color fastness to rubbing test(dry/wet)

Quality Standards:

Hypoid Composite Knit Ltd. Follows the quality standard: ISO-9001:2000.

Fabric Inspection:

The inspection of fabric is a procedure by which the defects of fabric are identified and fabric is classified according to degree or intensity of defects. The fabric inspection is done for both grey and finished fabric.

Grey Fabric Inspection:

Grey fabric inspection is performed according to 4-point system.

Finished Fabric Inspection:

4 point numbering system is followed for finished fabric inspection. Defects found in the final inspection.

- Uneven shade
- Oil Spot
- Naps
- Crease Mark
- Machine stoppage mark
- Listing
- Line mark
- Double yarn
- Fly yarn contamination

6.14 FINISHING

The process by which unwanted crease and crinkle are removed with the view of increasing smoothness, brightness and beauty of the garments is called finishing. In the garments industries it is called ironing. This process plays an important role to grow attractiveness to the buyers.

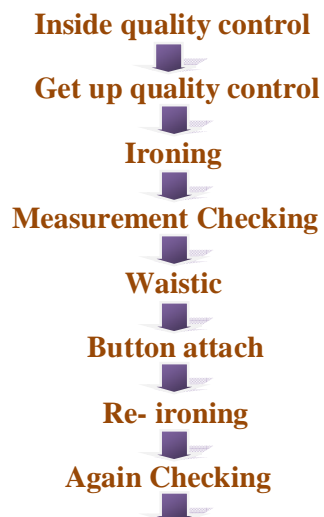
6.14.1 MAMPOWER

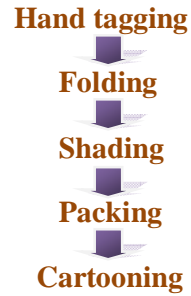
➤ In Charge	: 01
➤ Supervisor	: 02
➤ Iron Man	: 14
➤ Folding Man	: 10
➤ Packing Man	: 04
➤ Quality Inspector	: 20

6.14.2 ORGANGRAM OF FINISHING SECTION



6.14.3 FLOW CHART OF FINISHING SECTION:





6.14.4 IRONING

This is a finishing process done by subjecting a cloth to heat & pressure with or without steam to remove unintended creases and to impart a flat appearance to the or garments. Also, pressing is done to introduce creases in the garments, in garments industries, pressing is called Ironing.

- Remove of unwanted creases and crinkles.
- To apply creases where necessary.
- Shaping.
- Under pressing.
- Under pressing.
- Final pressing.

6.14.5 LIST OF ACCESSORIES USED IN FINISHING

- Main Level
- Size Level
- Care Level
- Hang Tag
- Bar code Sticker
- Poly Bag
- Tag Pin
- Carton
- Hang Tag String
- Clip
- Paper Gum Tape
- Silica Jel
- Tissue Paper

11.14.6 SOME PICTURES OF FINISHING SECTION



Fig: Ironing Section



Fig: Folding Section



Fig: Packing Section

6.14.6 CHEMICAL USED TO REMOVE SPOT

- | | |
|-----------------|--------------------|
| ➤ Dyeing Spot | : Lifter |
| ➤ Cutting Spot | : Thinner |
| ➤ Printing Spot | : Thinner |
| ➤ Oil Spot | : Thinner or Power |
| ➤ Sewing Spot | : Lifter |

Thinner:

Thinner is used to remove the soil spot, color spot, dust and dirty spot, etc.

Lifter:

Lifter is used to remove the oil spot, soil spot, sewing spot etc.

Water:

Water is used to remove the dirty spot, ink color, etc.

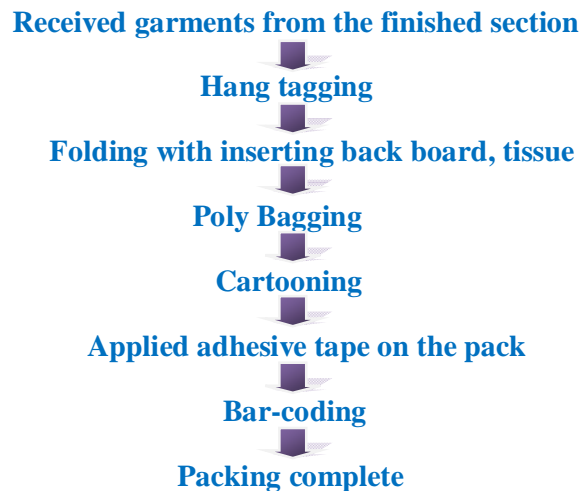
6.15 FINAL INSPECTION OF GARMENTS

For complete garment that is not in bundle form, it is recommended that statistical inspection done based on AQL.

SL No	Lot/Quantity(GMTS size in units)	AQL 1.5	Max no defective allowed	AQL 2.5	Max no defective allowed	AQL 4.0	Max no defective allowed
1	51-90	8	0	20	1	13	1
2	91-150	32	1	20	1	20	1
3	151-280	32	1	32	2	32	3
4	281-500	50	2	50	3	50	5
5	501-1200	80	3	80	5	80	7
6	1201-3200	125	5	125	7	125	10
7	3201-10000	200	7	200	14	200	14
8	10001-35000	315	10	315	14	315	21
9	35001-150000	500	14	500	21	315	21
10	150001-190000	800	21	500	21	35	21

6.16 PACKING AND DELIVERY

6.16.1 FLOW CHART OF PACKING SECTION



6.16.2 CARTOON

Generally there are three types of carton. They are,

➤ **Depend on Stitching:**

- ✓ Stitching Carton.
- ✓ Non-Stitching Carton.

➤ **Depend on ply:**

- ✓ 3 Ply Carton
- ✓ 5 ply Carton
- ✓ 7 ply Carton

➤ **Depend on Size:**

- ✓ Master Carton.
- ✓ Inner Carton.

✚ **Carton Measurement:**

If Length, Width, Height is in cm, then

$$(L+W) \times (W+H) \times 2$$

$$\text{Rule 1 (Without Wastage)} = \frac{\text{—————}}{100 \times 100} \text{ m}^2$$

$$(L + W + 6) \times (W+H+4) \times 2$$

$$\text{Rule 1 (Include Wastage)} = \frac{\text{—————}}{100 \times 100} \text{ m}^2$$

$$(L+W) \times (W +H) \times 2$$

$$\text{Price per Square Meter} = \frac{\text{—————}}{100 \times 100} \times \text{Rate per m}^2$$

$$= \text{Rate per pcs.}$$

✚ **Information that mentioned on the carton:**

- Buyer Name : NTD Apparel.
- Order No. : 1001407
- Design No. : 256LF.
- Style : AR345

- QTY : 50 pcs.
- Destination : Canada.
- Net Wt. : 2.5 kg.

✚ **EXAMPLE FOR CARTON MEASUREMENT:**

Size Color	S	M	L	XL	XXL	Total Pieces
Placed Blue	2	7	8	6	2	25
Terracotta	2	7	8	6	2	25
Total	4	17	16	12	4	50

11.1 Utility Service:

Here the following utility services are available-

1. Water
2. Electricity
3. Steam
4. Gas
5. Compress air

Water Pumps:

Centrifugal Pump for water supply to Dyeing & Others Section			
1	20 H. P Pedrollo Pump each pump, 1000L/min	4 Units	4,000.00L/min
2	10 H.P Pedrollo Pump flow rate, 600 L/Min	1 Unit	600.00L/min
3	5.5 H.P Pedrollo – Pump flow rate, 50 L/Min	1 Unit	350.00L/min
4	Spare Pump Motor Pedrollo 20 H.P 1 Unit and 5.5 H.P	1 Unit	1, 00L/min
5	Jhonson Pump (30 H.P)	2 Unit	100 m ³ /hr
6	KSB Pump (30 H.P)	1 Unit	100 m ³ /hr
7	Submerssible Pump KSB	46 Kw	150 m ³ /hr

Natural Water Quality:

Water for a textile plant may come from various sources. These include surface water from rivers and lakes, and subterranean water from wells. In PPC they collect water from Under ground. Natural and pretreated water may contain a variety of chemical species that can influence textile wet processing in general, and dyeing in particular.

The various salts present in water depend on the geological formations through which the water has flowed. These salts are mainly the carbonates (CO_3^{2-}), hydrogen carbonates or bi-carbonates (HCO_3^-), Sulphates (SO_4^{2-}) and chlorides (Cl^-) of calcium (Ca^{2+}), magnesium (Mg^{2+}). Although calcium and magnesium carbonates in limestone are relatively insoluble in water. So in this reasons, water hardness can be divided into two ways-

1) **Temporary hardness** : Temporary hardness of water which contain such this materials as $\text{Ca}(\text{HCO}_3)_2$, $\text{Mg}(\text{HCO}_3)_2$, $\text{Fe}(\text{HCO}_3)_2$.

2) **Permanent hardness** :Parmanent hardness of water which contain such this materials as CaCl_2 , CaSO_4 , $\text{Ca}(\text{NO}_3)_2$, MgCl_2 , MgSO_4 , $\text{Mg}(\text{NO}_3)_2$.

This water hardness causes some serious consequences in a textile dyeing and finishing industries and these are -

- ❖ Precipitation of soaps.
- ❖ Redeposit ion of dirt and insoluble soaps on the fabric being washed , this can cause yellowing and lead to uneven dyeing and poor handle.
- ❖ Precipitation of some dyes as calcium and magnesium salts.
- ❖ Scale formation on equipment and in boilers and pipelines.
- ❖ Reduction of the activity of the enzymes used in washing.
- ❖ Incompatibility with chemicals in finishing recipes and so on.

Hardness expressed by parts per million (ppm) of CaCO_3 which is standard hardness scale and it is also called American hardness. The hardness of raw water is 100 ppm or more. To use it in dyeing and in boiler this water must need to soft & foreign materials needs to remove.

11.2 Standard Water Quality for Dye House:

Parameter	Permissible concentration
Color	Color less
Smell	No bad smell
Water Hardness	<5 ppm
PH value	7-8 (Neutral)
Dissolve solid	< 1 ppm
Inorganic salt	< 500 ppm
Iron (Fe)	< 0.1 ppm
Manganese (Mn)	< 0.01 ppm
Copper (Cu)	<0.005 ppm
Nitrate (NO_3)	< 50 ppm
Nitrate (NO_2)	< 5 ppm

Source of Utility: The main Utility, which is used by Biswas Group Ltd. is Natural gas. From Natural gas generator produce electricity. From natural gas and electricity in associate with mechanical and electrical apparatus.

11.3 Capacity and Other Technical Details:

Power (Electricity): Generator house is the main Power Producing Plant of Biswas Group Ltd. there are two Generators in Generators house. Specifications of two Generators are given below:



Waukesha gas Generator

Brand	Waukesha
Gas Intake	0.20 mm
Gas Exhaust	0.66 mm
RPM	1500
Fuel	Natural Gas
Capacity	164 KW
Orogin	USA
Available	3 pieces

11.4 Boiler: Steam generator or boiler is usually a closed vessel made of steel

Function: Boiler function is to the heat produced by the combustion of fuel (Gas) to water and ultimately to generator steam. The steam produced may be supplied in wet processing department for –

- ▶ Heating cylinder dryer
- ▶ Steaming during dyeing

Objects: For supplying steam.

11.5 Types of steam:

1. Wet steam
2. Dry saturated steam, and
3. Superheated steam.

In Biswas Group Ltd. wet steam is used for the relevant processes.

Boiler Specification:

Brand Name	: Revotherm
Origin	: India
Type	: Fire tube boiler
Capacity	: 5.5 ton per hour
Pressure	: 5 bar
Temperature	: 180° C
Fuel	: Natural Gas
Year of Manufacturer:	2000



Revotherm Boiler

Water supply for the boiler:

Water required for steam production is supplied by deep tube well.

Pretreatment of the boiler water:

Boiler feed water needs special standard. Any deviation from the required standard may result in scale formation, which eventually reduces the efficiency of the boiler. This ultimately affects the cost of steam generation and makes the production cost high. To maintain the required standard of the water, there should be some means to pretreat that the boiler feed water. To protect scale formation of boiler, NELCO is used as chemical in water feed tank. 200 gm NELCO is injected per 12 hrs. In Biswas Group Ltd. there are water softeners that act before the water enters the boiler.

11.6 Manufacture of the softener: The manufacturer of the softener is cleaver brocks

U.S.A.

No of the Softener: There are two water softener to pretreated the boiler feed water

Softener Specification:

Brand Name: Cleaver brocks
Model No: ACC- SMR – 150 – 1- 1/2T
Serial No: CH – 0000 236
Capacity: 150000000GRS / TANK
Unit NO: HS 008892
Pipe Size: 1.5 inch
Salt Capacity brine marker: 576 Ibs

11.7 Compressed Air: The compressed air is supplied from air condition from air compressor. There are two air compressors in Biswas Group Ltd.

Compressor No: 01

Brand Name: BOGO
Origin: Japan
Model No: S361694
Serial No: 546206
Maximum working pressure: 10 bar
Average working pressure: 6-7.5 bar
Year of Construction: 2001

Volt: 400Frequency: 50 Hz



8.1 Definition:

Compliance means conformity of certain standard. PPC maintain a moderate working condition for their employees. Though it is well established project, there is some lacking of proper compliance issues. Here is list of compliance in which some points are maintained fully and some are partially.

- + Compensation for holiday
- + Leave with wages
- + Health register
- + Time care
- + Accident register
- + Workman register
- + Equal remuneration
- + National festival holiday
- + Overtime register
- + Labor welfare
- + Weekly holiday fund
- + Sexual harassment policy
- + Child labor abolition policy
- + Anti-discrimination policy
- + Zero abasement policy
- + Working hour policy
- + Hiring /recruitment policy
- + Environment policy
- + Security policy
- + Buyers code of conduct
- + Health and safety committee
- + Cante

8.2 Health:

- ❖ Drinking water at least 4.5 L/day/employee
- ❖ Cup availability
- ❖ Drinking water supply
- ❖ Water cooler ,heater available in canteen
- ❖ Drinking water signs in Bangla and English locate min. 20 feet away from work place
- ❖ Drinking water vassal clean at once in a week
- ❖ Water reserve at least once a week
- ❖ Water center in charge person with cleanliness
- ❖ Suggestion box register

Toilet:

- ❖ Separate toilet for women and men
- ❖ A seat with proper privacy and lock facility
- ❖ Urinal accommodation
- ❖ Effective water sewage system
- ❖ Soap toilet
- ❖ Water tap
- ❖ Dust bins
- ❖ Toilet white washed one in every four month
- ❖ Daily cleaning log sheet
- ❖ No-smoking signs
- ❖ Ladies /gents toilet signs both in bangle and English
- ❖ Deposal of wastes and effluent

Fire:

- ❖ Sufficient fire extinguisher and active
- ❖ Access area without hindrance
- ❖ Fire signs in both languages
- ❖ Fire certified personal photo
- ❖ Emergency exit

Safety Guard:

- ❖ Metal glows on good conditions
- ❖ Rubber mats & ironers
- ❖ First aid box one
- ❖ Ironers wearing sleepers
- ❖ First trained employees
- ❖ Motor/needle guard
- ❖ Eye guard
- ❖ Nurse
- ❖ Doctor
- ❖ Medicine
- ❖ Medicine issuing register

Others:

- ❖ Room temperature
- ❖ Lighting facilities



Fig: Doctor



Fig: First aid box



Fig: Fire training

১৯৭৯ সালের কারখানা বিধিমালা অনুযায়ী
ফর্ম নং ১৩
(৭২ ও ৭৪ নং বিধি দ্রষ্টব্য)

কারখানার নাম : বিশ্বাস ফ্যাশন লিঃ

বানের নাম	আরম্ভের সময় (সকাল)	বন্ধের সময় (দুপুর)	বিরতি	আরম্ভের সময় (দুপুর)	বন্ধের সময় (বিকাল)
শনিবার	৮.০০টা	১.০০টা	দুপুর ১.০০টা থেকে দুপুর ২.০০টা থেকে (০১ ঘণ্টা)	২.০০টা	৫.০০টা
রবিবার	৮.০০টা	১.০০টা		২.০০টা	৫.০০টা
সোমবার	৮.০০টা	১.০০টা		২.০০টা	৫.০০টা
মঙ্গলবার	৮.০০টা	১.০০টা		২.০০টা	৫.০০টা
বুধবার	৮.০০টা	১.০০টা		২.০০টা	৫.০০টা
বৃহসপতিবার	৮.০০টা	১.০০টা		২.০০টা	৫.০০টা
শুক্রবার					

সাপ্তাহিক ছুটি কর্তৃপক্ষ

9.1 EFFLUENT TREATMENT PLANT (ETP)

The wastewater produced in the different processes of **Biswas Group Ltd.** is effectively removed by using the ETP. The water that is disposed after treatment is perfect for disposal according to the DOE (Department of Environment) & ISO 14001. But the capacity of the ETP can only treat up to 60% of total water discharged by the factory. It lacks more space to expand the ETP that will treat 100% of wastewater.

9.2 STEP WISE FUNCTION OF DIFFERENT UNITS OF E.T.P:

UNTREATED WATER



STORAGE TANK



Functions:

Storing The discharged water for supplying to Homogenization tank



HOMOGENIZATON TANK



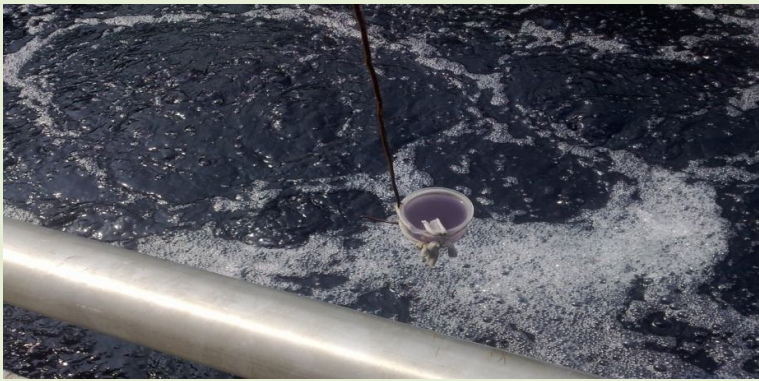
Functions:

Water stays here for 4 hours; Various types of water mixed here for introducing Uniformity.

Functions:
Here Water is treated with 98% H₂SO₄ for 30 minutes for neutralization.



MIXING TANK

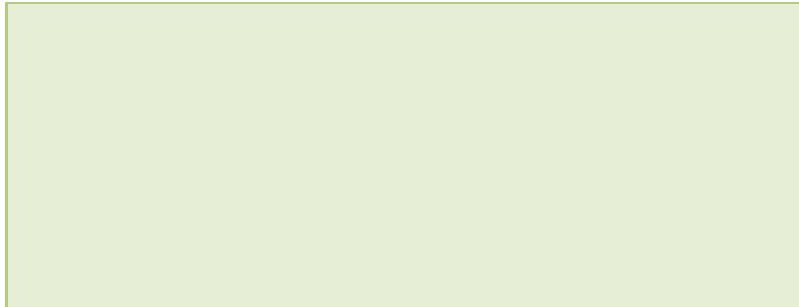


Functions:
Here bacteria are inserted in neutralized water in a continuous Process



OXIDATON TANK





Functions:

Here Water stays the longest time (48 hours) and this is the largest tank of any ETP system, here we have 2400m³ volume capacity. Color is de-activated here; hence, it does the main job.



LAMELLA CLARIFIER



Functions:

Differentiation of bacteria from water, other particles are precipitated in this tank.





SLUDGE RETURN TANK



Functions:

in this tank, precipitated Sludge is stored and forwarded to Mixing tank for re-using the alive bacteria. This Process is called as Activated Sludge Process.



TREATED WATER



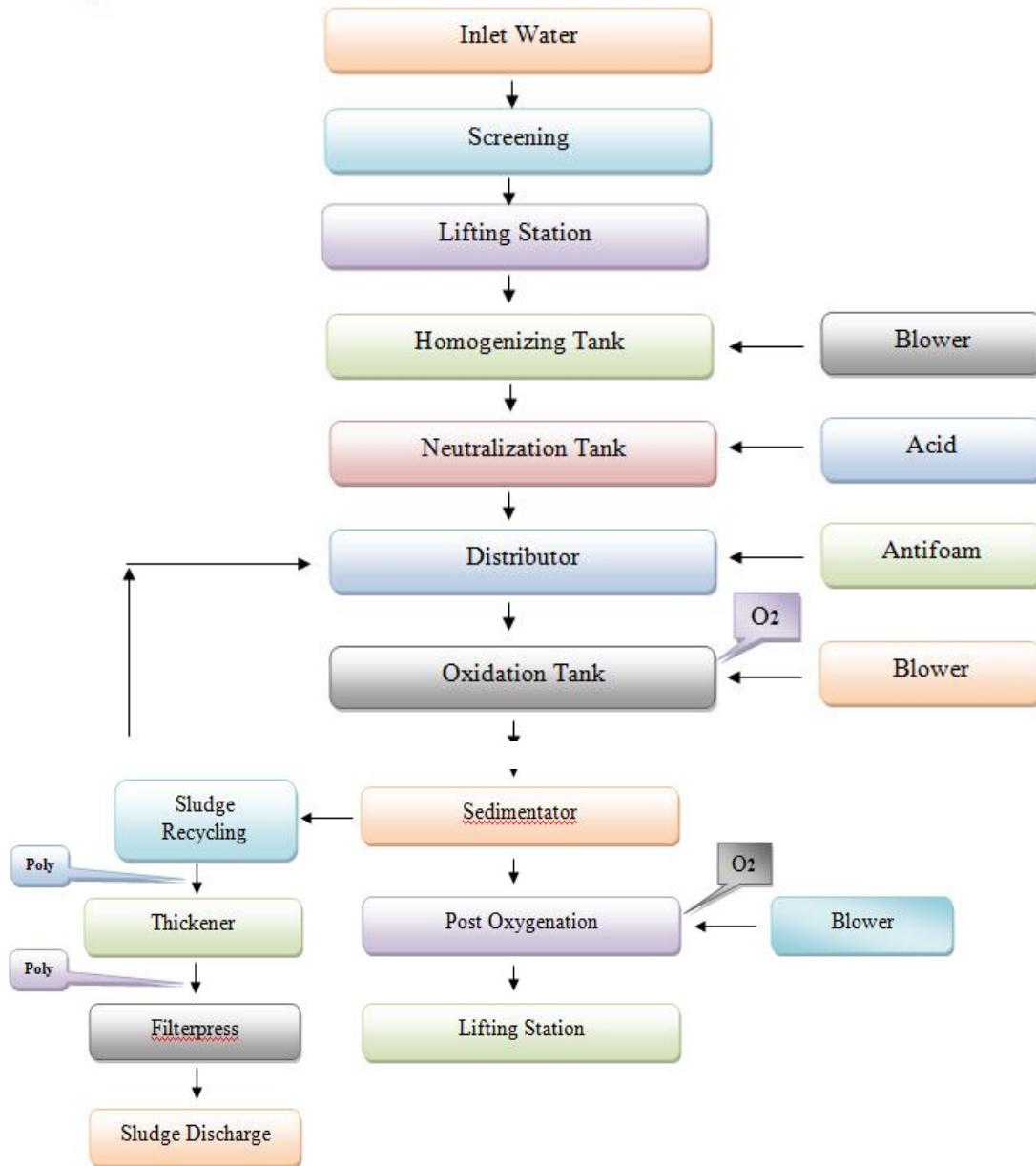
Functions:

This water is now suitable for use by performing de-mineralization. This water will not harm the environment much more like discharging untreated water.

THE NEXT STEPS ARE:

Sludge Thickener: Here densely thickened sludge gets gathered, then they are thickened further using Polyelectrolyte.

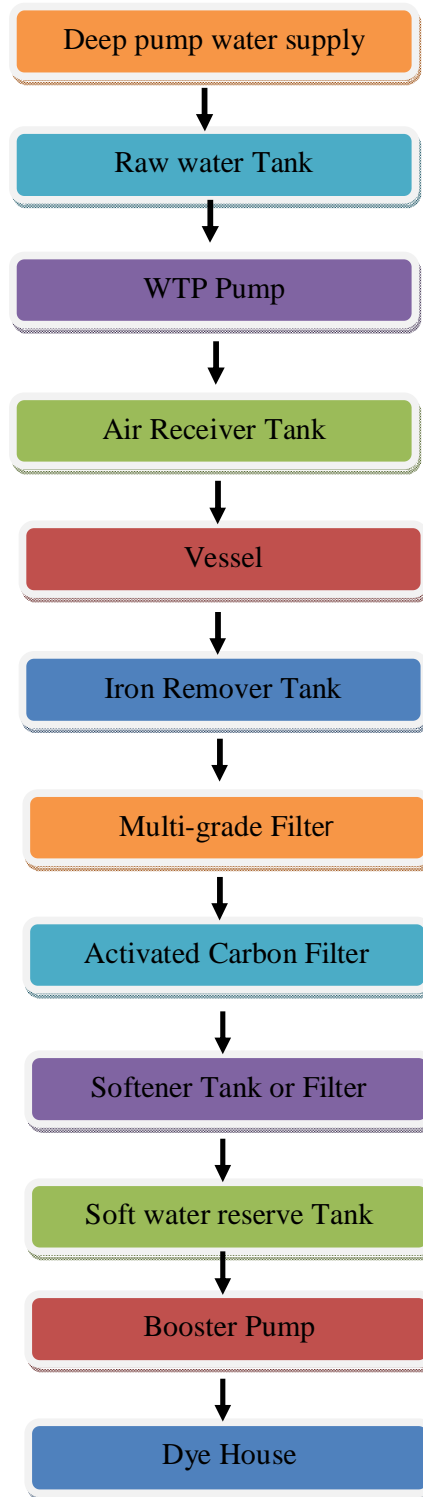
Flow process of ETP:



Photos of ETP



9.3 Flow chart of water treatment plant:



9.5 Water Treatment Plant

Water Treatment Plant:

The water treatment plant is a vital part of the dyeing section where the supply water of the dyeing floor is treated and cured for proper dyeing. The supply water contains various soluble effluents like dissolved solids, metal compounds and other impurities which can lead to any sort of fabric fault during dyeing the knitted fabrics. The process sequence of the water treatment plant in Divine Textile Limited textile mill is briefly discussed below:

Pump:

The Deep pump is used for extracting water from raw water tank to pass in the dyeing section for the process of fabric dyeing.

Raw Water Tank:

Raw water tank is placed 20 feet deep tank where the water needed in the dyeing and finishing process is deposited and by the water pump the water in the tank is extracted.

Air Receiver Tank:

Air receiver tank is used for the passage of air from the boiler to the Iron exchanger tank.

Vessel:

The vessel is where the water from the WTP pump is collected.

Iron Exchanger Tank:

The metals contained in the water are removed or broken down by applying air from the received from the air receiver tank.

Multi Grade Filter:

The multi grade filter is used for removing the residual iron contained in the treated water.

Activated Carbon Filter:

The activated carbon filter is used for removing the remaining metals and other impurities by passing the water flow through rocks of different sizes arranged in different layers of the tank. At first there is a layer of small rocks and next is a layer of medium rocks and finally comes a layer of big rocks. The tank contains a carbon layer in middle.

Softener Tank:

The softener tanks contains resin and in the softening tank water softening chemicals are applied for reducing the hardness of the water and making the water flow suitable for fabric dyeing.

Soft Water Reserve Tank:

The processed soft water is reserved in the soft water reserve tank.

9.6 Photo Of WTP



Water Treatment Plant

BISWAS GROUP LTD. is a well-planned versatile project. The administrations, management, chain of command – all are well organized. They are devoted to satisfy the customer by their activities. However, some of the point we want to mention for the good of **BISWAS GROUP LTD.**

Some Suggestions:

- ❖ During the transport of the fabric in the dyeing floor and also during the loading of the M/C, fabrics are soiled for the contact with floor. This makes the fabric / part of the fabric dirty. It may require more scouring/bleaching agent or may create stain making it faulty.
- ❖ The dyeing floor is water most of the time: it should be cleaned all the time.
- ❖ The illumination of the dyeing shade should be enhanced. It may exert the worker fatigue ness
- ❖ More skilled labor should be used in a project as **BISWAS GROUP LTD.** Many times the dosing pipelines are clogged due to the careless dosing of chemicals.
- ❖ The M/C stoppage time should be analyzed and minimized. The maintenance should be carried out when the M/C is out of action.

Limitation of the Report:

- ❖ Because of secrecy act the data on costing and marketing activities has not been supplied & hence this report excludes these chapters.
- ❖ Some of the points in different chapter are not described as these were not available.
- ❖ The whole process is not possible to bind in such a small frame as this report, hence our effort spent on summarizing them.
- ❖ We had a very limited time in spite of our willing to study more details it was not possible to do so.

Lastly:

At last I again give thanks to almighty ALLAH for successfully completed my industrial attachment. Actually, **BGL** is a 100% export oriented composite industry. During the training period, I have completed our industrial attachment to a systematic routine which was provided by **BISWAS GROUP LTD.**

BISWAS GROUP LTD. is a well-planned versatile project. The administrations, management, chain of command- all are well organized. They are devoted to satisfy the customer by their activities. However, some of the point we want to mention for the good of **BISWAS GROUP LTD.**

The specially of this report is that the information, data & description very much subjective & practical. So, one can easily have an idea about the whole dyeing unit of **BISWAS GROUP LTD.** at a single look on it.

The factory runs by a number of efficient textile engineers, skilled technical and non-technical persons. All the textile engineers and technical and non-technical persons are very sincere, co-operative and helpful.

18. Reference:

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