



INDUSTRIAL ATTACHMENT
IN
MAGPIE COMPOSITE TEXTILE LTD.
BY
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ID # 091-23-1334

This training is conducted in Partial Fulfillment of the requirements for the degree
Bachelor of Science in Textile Engineering

SUPERVISED BY

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TEXTILE ENGINEERING
DAFFODIL INTERNATIONAL UNIVERSITY
DHAKA, BANGLADESH
OCTOBER 2013



DECLARATION

I hereby declare that, this Industrial Attachment has been done by me under the supervision of **Salima Sultana Shimo, Lecturer, Department of TEDaffodil International University**. I also declare that neither this report nor any part of this report has been submitted elsewhere for award of any degree or diploma.

Supervised by:

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Dedicated to my parents



Acknowledgement

At first my gratefulness goes to Almighty Allah to give me strength and ability to complete the industrial training and this report. You have made my life more beautiful. May you name be exalted, honored and glorified.

Now I wish to take this excellent opportunity to thank a lot of people who have assisted and inspired me in the completion of my training period. **Lecturer, Salima Sultana Shimo**, my supervisor, I extremely indebted for her tremendous support and guidance throughout my training period. Being working with her I have not only earned valuable knowledge but was also inspired by her innovativeness which helped enrich my experience to a greater extent. Her ideas and way of working was truly remarkable.

I also express my gratitude to **Professor Dr. S. M. Mahbub-Ul-Haque Majumdar, Dean, Faculty of Science & Information Technology**, and **Professor. Dr. MahbubulHaque, Head of the Department of Textile Engineering**, for their support and continuum guidance throughout my long journey in Daffodil International University and the endometrial training.

I would like to thank the management of the **Magpie Composite Textile Ltd.** for giving me the opportunity to do the industrial training successfully and also their valuable suggestions. My deepest appreciation goes to especially **Mr. H. M. Abdus Sahid** General Manger Dyeing & Finishing section, **Md. Atiqur Rahman** Senior Executive Dyeing & Finishing Section Magpie Composite Textile Ltd. For their permission to conduct my industrial training without which it would be incomplete. The gene Rome support is greatly appreciated. I would also like to thank executives, senior executives and other officials Magpie Composite Textile Ltd. for helping me to complete industrial training successfully. My gratitude also goes to all the employees of Magpie Composite Textile Ltd. for their sincere co-operation, support and valuable advices.

Last but not least, thanks go to my presume family for their never ending love and inspire at every stages of my life. Without their continuous support me realize that me would not be a person me are right now.



Introduction:

Textile and garments sector is the biggest and fastest growing sector in Bangladesh. It is also the highest foreign currency earning sector in Bangladesh. Among this sector, Knit garment is growing very rapidly due to smaller investment requirement, greater backward linkage facility & higher profit than woven garments. That's why export of knit garments is increasing steadily for last few years and up to now.

Textile education can't be completed without industrial training. Because of this industrial training it minimizes the gap between theoretical and practical knowledge and make meaccommodated to industrial environment. I got an opportunity to complete two-months long industrial training at **Magpie Composite Textile Ltd**, which is a 100% export-oriented composite Knit Garments. It has planned & equipped fabric dyeing-finishing and garments units in addition to facilitate knitting and knitwear manufacturing.



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BOARD OF DIRECTORS



Chairman
Alhajj Habibur Rahman

Managing Director
Arifur Rahman

Director
Afroz Al Mamun

MESSAGE OF MANAGING DIRECTOR

This is an opportunity to introduce our company "magpie group" situated in Dhaka, Bangladesh-a country which has SUNDARBANS the only mangrove forest of the world and also the longest sea beach Cox's Bazaar. We are a developing country but resourceful and people are very hard working.



Bangladesh is the third largest garments exporter in the world but second largest in sweater export. In sweater, in Bangladesh, I have revolutionized with the largest number of computerized sweater knitting machines (250 sets) with latest version which are all multi gauge. Most of the machines are from Stoll, Germany which ensures high quality and makes huge volume of productivity of around 50,000 Dzn/m. "magpie group" is a vigorously growing company as it started its journey in 2003 in sweater manufacturing with only 300 hand driven machines.

In 2007, magpie added a new leaf setting magpie composite textiles. In composite, I am vertically set up from fabric knitting to dyeing and sewing. We have ETP plant to minimize environmental hazards and also am giving emphasis to develop re-cycling yarn to protect environment.

In 2011, I have taken over creative wool ware ltd. The factory contains 120 set of computerized knitting machine and 600 set of manual knitting machine. The merging of creative wool ware ltd. with "magpie group" unveils the new horizon of sweater sector in Bangladesh. I am now pioneer for sweater exporting in Bangladesh. I can take challenges to produce any kind of qualitative sweater to support buyer. I am the most contingent and fast expanding garment manufacturing group of Interties in Bangladesh. We are expanding by keeping my commitments and promises to maintain standards of my products "magpie group" has not only concentrated in modern machines but also enriched its management team with highly skilled, professional and experienced high level employees from home and abroad. We are very strong in making any kind of fancy yarn



and accessories to produce value added fashionable product. Theme in this growing market it has become one of the modern, stable and innovative company in the garments sector in Bangladesh.

As the Managing Director of "magpie group" I am determined to ensure high level of support and service and welcome valued buyers to visit Bangladesh to develop business here.

Thanks & best regards

M. ArifurRahman

Managing Director

magpie group

COMPANY LOCATION:



Factory Address:

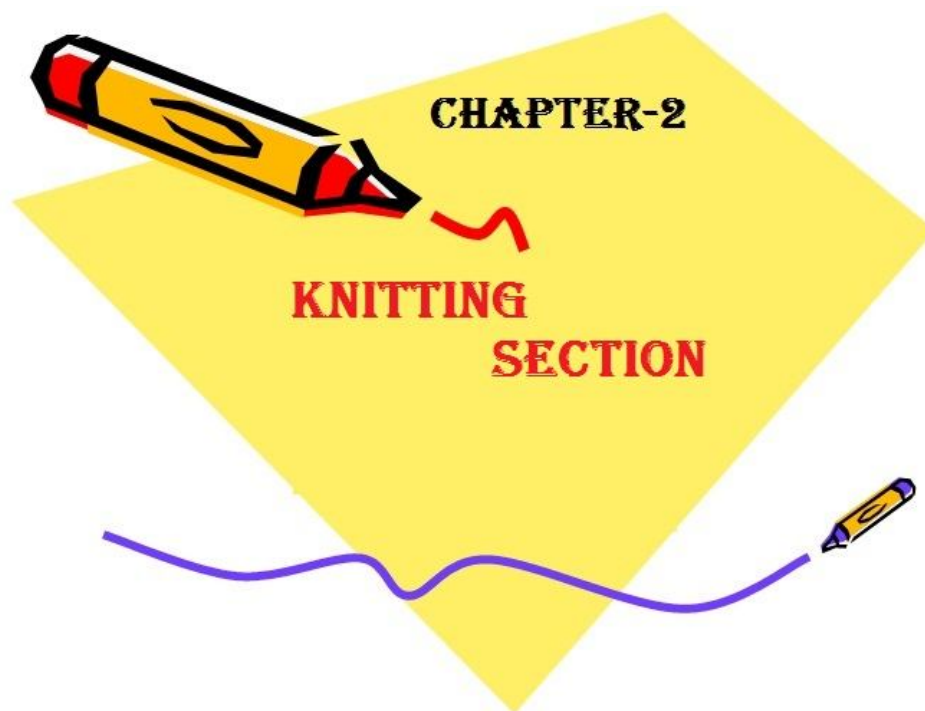
832/833, DewanEdris Road, Amtala, Kathgara, Savar, Dhaka, Bangladesh



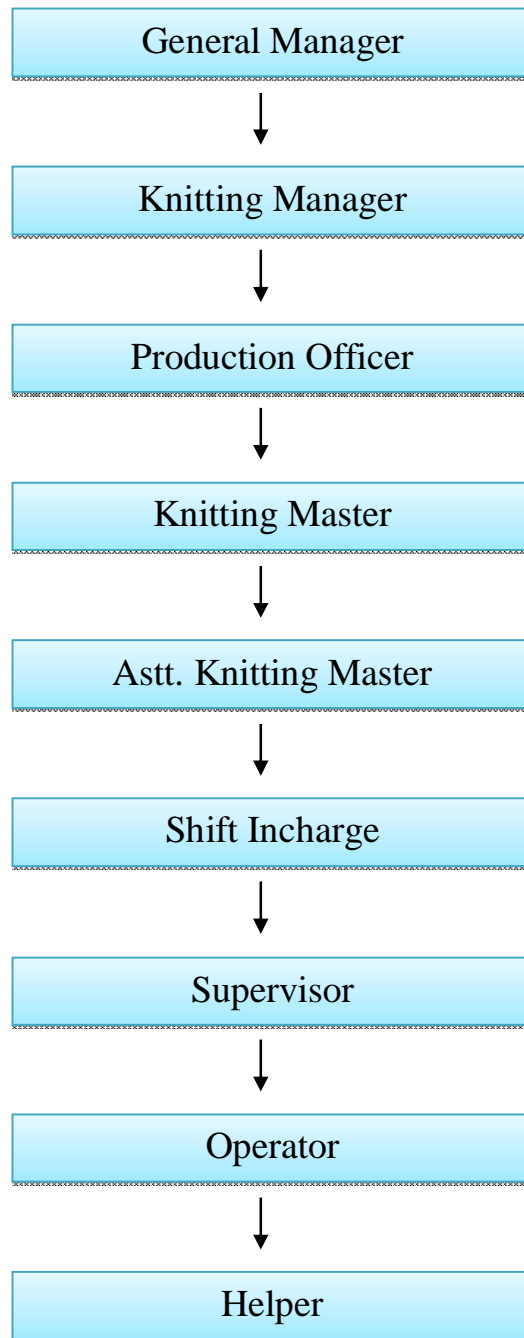
COMPANY PROFILE:

Company name	Magpie Composite Textile LTD.
Head Office	House # 05, Road # 09, Sector # 4, Uttara, Dhaka-1230
Tel No	88-02-8962437, 8954194
Fax	88-02-8918574
E-mail	dyeingmct@magpiegroupbd.com
URL	www.magpiegroupbd.com
Factory	832/833, DewanEdris Road, Amtala, Kathgara, Savar
Tel No	88-02-7792265
Fax No	06662616914
Location	50~70 minutes' drive from ZIA Airport to towards Ashulia.
Contacted persons	M. ArifurRahman (Managing Director)
	H. M. AbdusSahid (GM Dyeing & Finishing)
Year of Establishment	2007
Business	100% Export oriented Knit Fabrics & Knit Garments manufacturer
Production Capacity	Knitting : 5 Tons/Day
	Dyeing & Finishing : 6 Tons/Day
	Garments : 5,000 Pcs/Day

SL. No.	Name of the Bank	Address
1.	Agrani Bank, Principal Branch	Motijheel C/A, Dhaka-1000, Bangladesh Tel: +88029563659 Fax: +88029563662 Swift: AG BK BD DH Tekex: 642757 ABD BJ 632549 ABD BJ



ORGANOGRAM OF KNITTING SECTION



TYPES OF RAW MATERIAL:

- Yarn
- Lycra

SOURCE OF YARN FOR KNITTING:

Name of the spinning Mills	Location
Arif Knit Spinning Ltd.	Gazipur
The Delta Spinning	Kashipur, Gazipur
Square yarn ltd.	Kashipur, Gazipur
Bengol NFK Textile	Gazipur
NRG Spinning Mills	Gazipur
Prime Textile	Pagla, Narayngong
RSWM Ltd.	India
AA Kader synthetics	Narayngong
Shirin Spinning Ltd.	Shreepur, Gazipur
Hyosung Vietnam	South Korea
Malek Spinning	Valuka, Mymensingh
Sunny International	
Aman Cotton Fabrics Ltd.	

PROCESS DEFINITION:

Knitting is the interlocking of one or more yarns through a series of loops. The length wise columns of stitches, corresponding to the warp in woven cloth, are called Wales; the cross wise rows of stitches, corresponding to the filling in woven cloth, are called Courses, Filling Knits (Weft Knits) are those fabrics in which the course are composed of a single strand of yarn, while warp knits are those in which the Wales are composed of single strand of yarn. Gauge corresponds to the yarn in a woven fabric, and is defined as the number of needles of yarns in half inches of cloth. The higher the gauge, the more compact and finer is the cloth.

CLASSIFICATION OF KNITTING SECTION:

- Flat Knitting section
- Circular Knitting section
- Fabric inspection section

FLAT KNITTING SECTION:

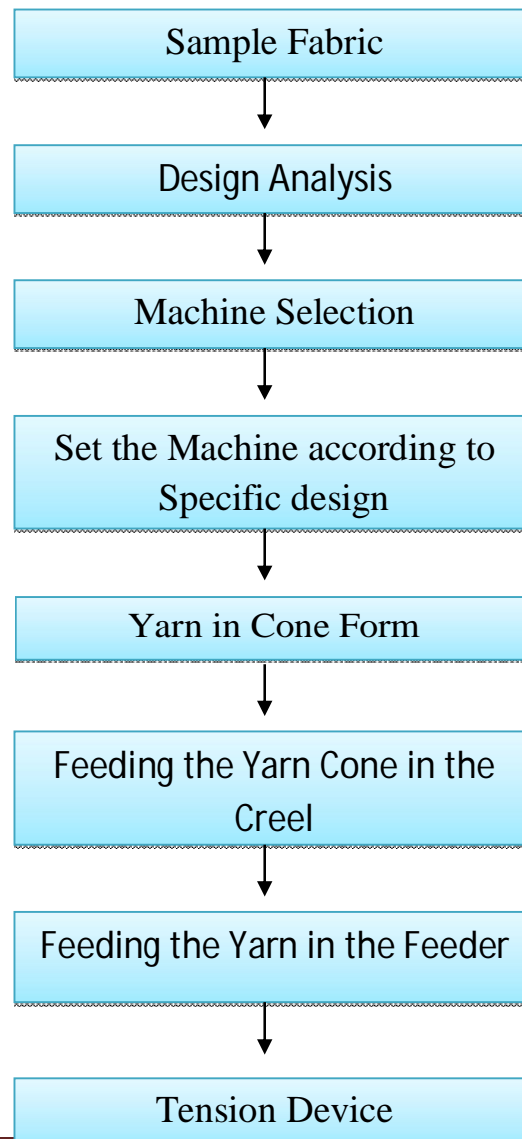
Generally collar and cuff of knitting garments is produced in this section there are flat knitting machines of the same type. The specifications of this machine are given below:

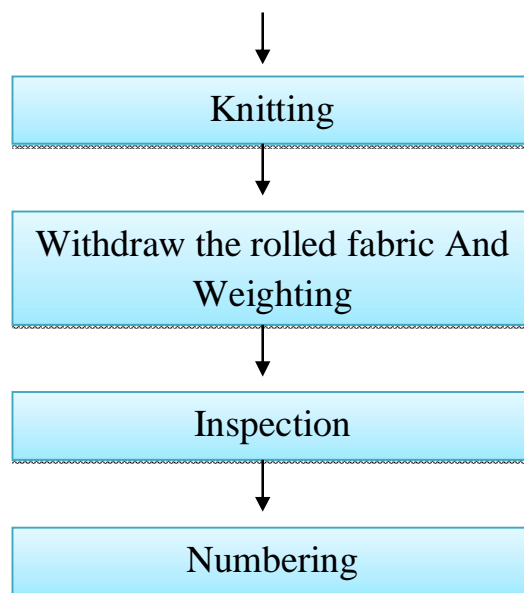
M/C Brand	M/C origin	No. of Machine	M/C dia in inch	Gauge	Total Needle	Run time
Matsuya	Japan	2	54	14	740x2	24
Flying Tiger	Taiwan	3	54	14	740x2	24
ShemaSiki	Japan	1	54	14	740x2	24

MACHINE DESCRIPTION OF CIRCULAR KNITTING SECTION:

Circular Knitting Machine	Single Jersey, Double Jersey
Single Jersey	08
Double Jersey	04
Total no of machine	12

PROCESS FLOW CHART OF KNITTING:





DESCRIPTION OF PRODUCTION PROCESS:

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

1. Firstly knitting manager gets a production shit from the merchandiser as according as consumer requirements then he informs or orders production officer about it.
2. Production officer informs technical in charge & knows about machine in which the production will be running.
3. 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.
4. Production officer with experienced mechanical fitter adjusts required stitch length & grey GSM for required final GSM.
5. Supervisor checks daily production regularity & make operator conscious about finishing tin due time.
6. Operators operate machine in high attention as if there were no faults in the fabrics. If he thinks or sure about any fabrics faults 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.
7. After required production & final inspection in 4- point system, they sent in dyeing section.

PRODUCTION PARAMETERS:

1. Machine diameter
2. Machine RPM
3. No. of feeds or feeders in use
4. Machine Gauge
5. Count of yarn
6. Required time (m/c running time)
7. Machine running efficiency

PRODUCTION CALCULATION:

Production/shift in Kg at 100% efficiency

$$\begin{aligned} & \text{RPM X No. of feeder X No. of Needle X SL} \\ = & \text{-----} \\ & 3527.80 \text{ yarn count} \end{aligned}$$

Production/shift in meter

$$\begin{aligned} & \text{Course / min} \\ = & \text{-----} \\ & \text{Course / cm} \\ \\ & \text{RPM X No. of feeder X 60 x 12 X efficiency} \\ = & \text{-----} \\ & \text{Course / cm X 100} \end{aligned}$$

Fabric width in meter

$$\begin{aligned} & \text{Total no. of Wales} \\ = & \text{-----} \\ & \text{Wales / cm X 100} \\ \\ & \text{Total no. of needle used in knitting} \\ = & \text{-----} \\ & \text{Wales/ cm X 100} \end{aligned}$$

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.

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

PHOTO GALLERY:



Fig: Circular Knitting Machine



Fig: Circular Knitting Machine



Figure: Fabric Inspection Machine

QUALITY STANDARD:

PPC maintains the ISO: 9001:2000 standards in case of quality. Therefore, the four point system is followed to inspect the body & rib fabric. The defects found & points given against are recorded in the inspection sheet. Following table shows the four point grading system followed by inspection at PPC.

Four Point Grading system	
Size of defects	Penalty
3 inches or less	1 point
Over 3 inch but not over 6 inch	2 point
Over 6 inch but not over 9 inch	3 point
Over 9 inch	4 point

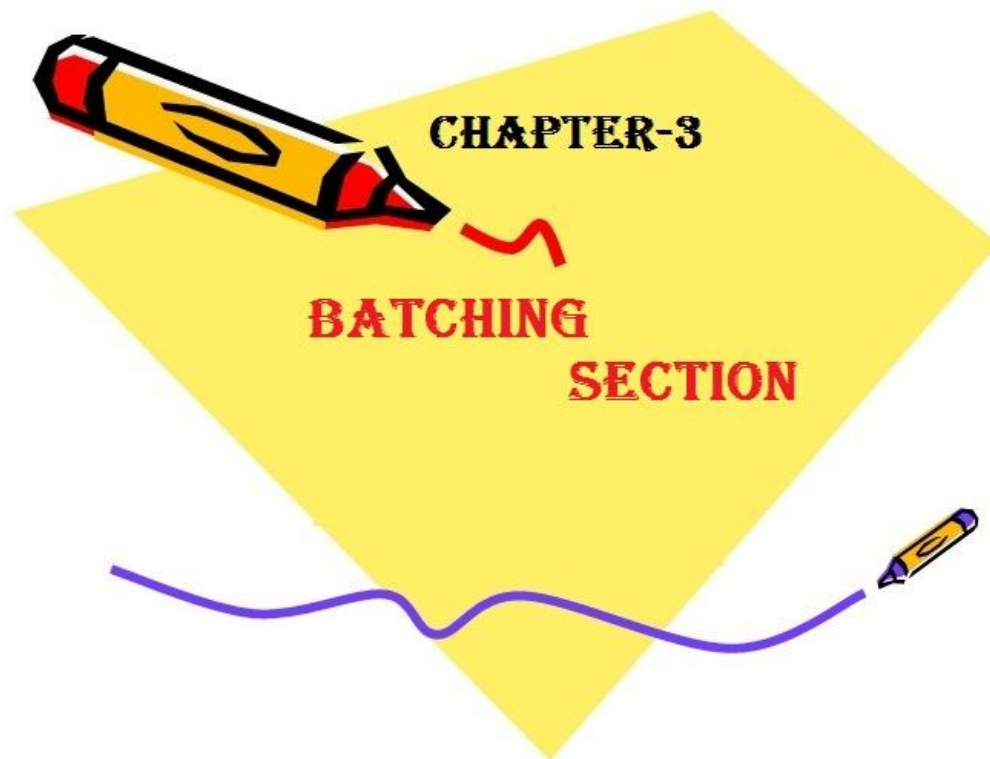
FABRIC INSPECTION SECTION:

There is one machine in cloth inspection section. Specification of this machine is given below:

Type	Cloth Inspection Machine
Country	China
Model No	YX-2400 A
Manufacturing date	2005
Speed	32 m/min

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 & workers so on.



DEFINITION

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

OBJECT OF BATCHING:

- ✘ To receive the grey fabric roll from knitting section or other smyce.
- ✘ Turn the grey fabric if required.
- ✘ 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, PE, PC, CVC).
 - Emergency.
- ✘ To send the grey fabric to the dyeing floor with batch card.
- ✘ To keep records for every previous dyeing.

PROPER BATCHING CRITERIA:

- ✘ To meet 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 meet a particular m/c for dyeing same shade.

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. Sometime planning is adjusted according to m/c condition or emergency.



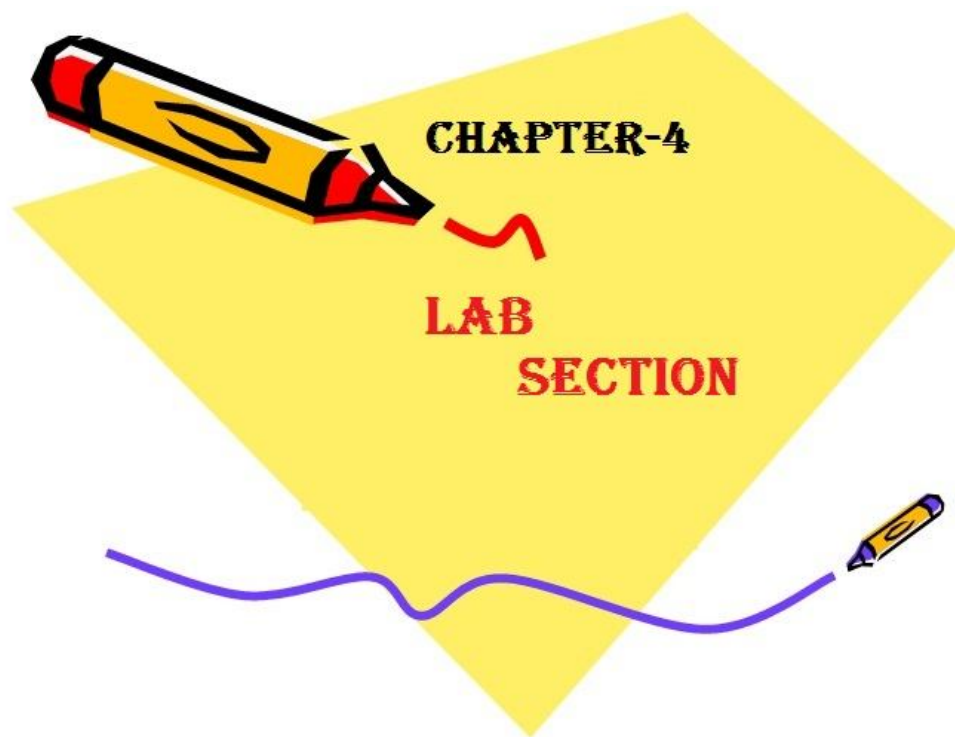
M/C's IN BATCH SECTION:

No. of M/c : 01
Machine Name : AIR TURNING M/C
Model : DNTA-400
Company Name: DONGO NAM CO LTD.
Origin : KOREA

MACHINE FUNCTION:

To turn out the fabric face side into back for avoiding visualization of spots on dyed fabric.

To transfer back side face of fabric to face side before dyeing.



MACHINERIES USED IN LAB

SL. NO	M/C NAME	MODEL	ORIGIN	CAPACITY(KGS)
01	Sample dyeing m/c (F & P)	HS-24 Srl-806121	China	Normal pressure 24 pots
02	Sample dyeing m/c (Rapid)	H-24 F A10001	China	High pressure 12 pots
03	Sample dyeing m/c (Rapid)	AD-24 Srl-80723	China	Normal pressure 8 pots
04	Fastness washing m/c STD ATLAS m-228	Rotawash A2288	UK	Normal pressure 8 pots
05	Dryer m/c (Tumbler)	Ariston AS-60V	USA	6 KG
06	Washing m/c	WD-10180		6 KG
07	Spectrophotometer X-rite	CF7000A	Macbeth USA	
08	Pillscope	STD Atlas W-1020	UK	
09	Dryer (with incubator)	527021/2	UK	Sample 12 of 4x4"
10	Color Assessment cabinet	Dengyng	Taiwan	
11	Crockmeter	M 238AA	UK	

12	ICI Pilling & snagging tester	M227A	UK	
13	Electronic Balance	ESJ200-4	UK	
14	Bante instrument	PHS-3CW	China	

DEFINITION

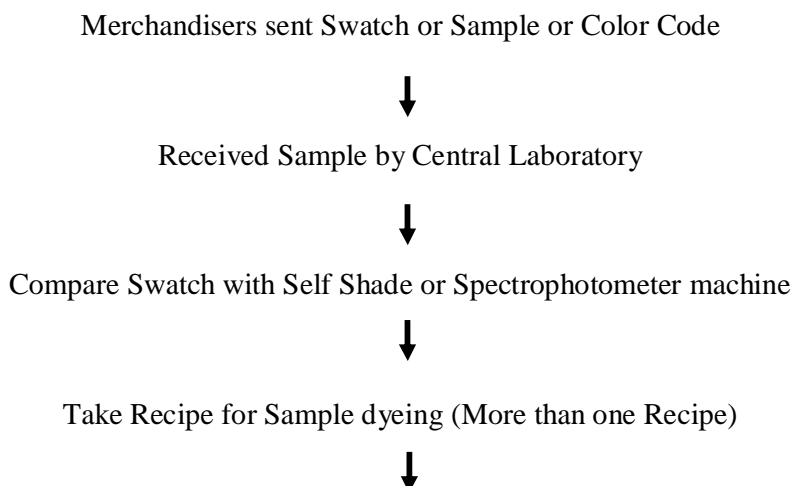
Lab Dip Development means the sample which is dyed according to buyer's requirements (similar shade and so on). Depending on lab dip development sample dyeing and bulk production dyeing planning done.

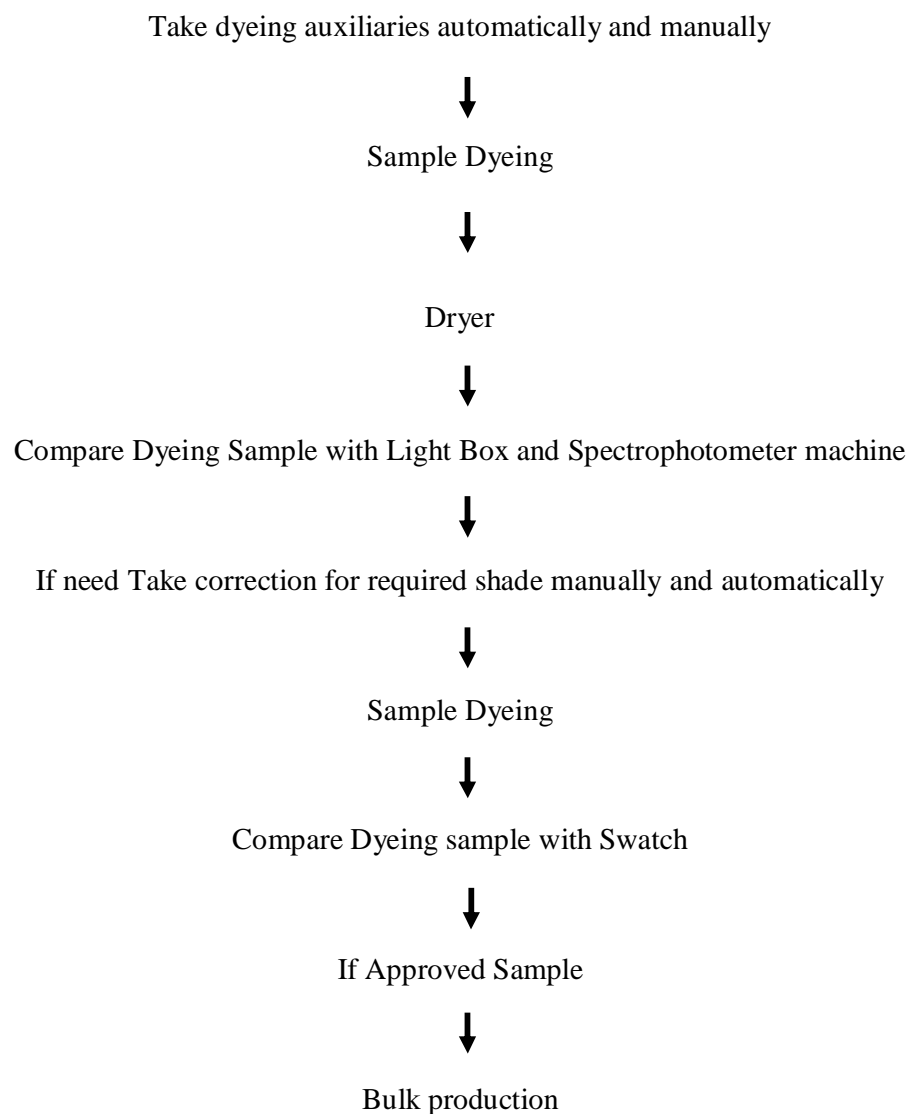
OBJECTIVE OF LAB DIP

- ✘ 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).

DEVELOPMENT OF LAB

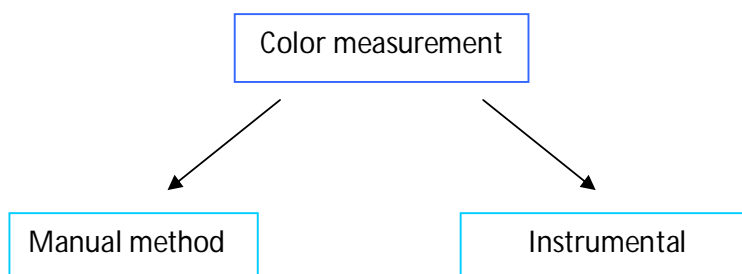
Lab Dip Development means the sample which is dyed according to buyer's requirements (similar shade and so on). The following sequence need to produce a Lab Dip.





COLOR MEASUREMENT OF STANDARD SAMPLE:

Color measurement is mainly done for the purpose of shade matching as perfectly as possible. Shade matching of the produced sample with the standard one is compulsory. Color measurement can be done by two methods –



In manual method, the std. sample's color is measured by comparing it with previously produced samples of different tri-chromatic color combination. The sample with which the color of the std. matched, that sample's color recipe is being taken for shade matching. This method's accuracy completely depends on the vision of the person related to it but person meet to be needed gather experience about color matching.

The instrumental method is more reliable if it is operated accurately to do the work of color measurement. "Spectrophotometer" interfaced with a PC is meet for shade matching. This instrument works with the principle of reflectance measurement of light at different wave length. When the standard sample is being subjected under spectrophotometer, then the instrument suggest a recipe with required tri-chromatic colors within the tolerance limit of color difference. In this way, color measurement of the standard sample is carried out for the purpose of shade matching.

PREPARATION OF STOCK SOLUTION FOR DYES AND CHEMICALS:

Preparation of stock solutionfor dyes -

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

Preparation of stock solution for chemicals-

Similarly 20% salt and 20% soda stock solutions are prepared in beakers for daily need.

DYES AND CHEMICALS MEASURMENT FORMULA FOR LABORATORY:

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

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

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

$$\text{Fabric wt.} * M : L * \text{g/l}$$

Amount of chemical soln (ml) = -----

$$1000 * \text{Conc. of stock sol}^n\%$$

Pipette made in dyeing lab:

0.1, 0.2, 0.5, 1, 2, 5, 10, 20 ml etc.

STOCK SOLUTION PREPARATION:

SHADE %	STOCK SOLUTION %
0.0001-0.009	0.01
0.10-0.99	0.5
1-1.99	1
2-3.99	2
4 TO MORE	4

SALT, SODA AND M: L RATIO ACCORDING TO SHADE%:

SL. NO.	SHADE%	SALT	SODA	WATER
01	0.001-0.019	20	6	1:8
02	0.20-0.40	25	8	1:8
03	0.41-0.50	30	10	1:8
04	0.51-0.74	35	12	1:8
05	0.75-1.49	40	13	1:8

06	1.5-1.79	45	14	1:8
07	1.80-3	50	15	1:8
08	3.01-4.99	60	18	1:8
09	ABOVE-5	70/80/90	20	1:8
10	VERY DEEP COLOR	100	25	1:8

SOME IMPORTANT TEST OF DYEING LAB

Hardness test of water:

Required chemicals:

1. Buffer → 5 drops
2. Indicator → 1 drops
3. EDTA → dropped until getting pink color.

Procedure:

- ✘ At first take 5ml water in a biker
- ✘ Then add 5 drops buffer into the water
- ✘ Shake it for few minutes
- ✘ Then add 1 drops indicator
- ✘ After adding the indicator then adds EDTA solution until getting pink color with the help of a test tube.

Result:

If we saw 0.1 ml will required for obtain result then we multiply 0.1 with 300 and result is 30 then hardness is 30.

Comments: Water hardness below 50 is good but above 50 is not good.

Color Fastness to Rubbing (met & dry):

Procedure:

At first take a sample of size (14 × 5) cm at Wales & Cmyse wise. Put the crocking cloth on to the finger & stag by finger clip & run 10 times in 10 seconds manually & assess the crocking cloth with gray scale.

Place the crocking cloth on the water, it will sucked some water and then squeeze the crocking cloth. Then place the met rubbing cloth on to the finger and stag with finger clip and run 10 times in 10 seconds manually. Then assess the crocking cloth by gray scale for met rubbing. Met and dry rubbing are checked according to buyer's requirement.

Color Fastness to Washing: (ISO 105-CO6):

Procedure:

1. Size of specimen: Cut sample & multifibre at (10 × 2)cm then stitch.
2. Detergent: 4g/l ECE detergent (WOB) + 1g/l sodium per borate put in distilled water & cooled at 20°C & measured P^H (where necessary).
3. Run the program in the following way: -

Test no.	Temp°C	Liq. volume ml	Time min.	Steel balls	Adjust pH
C2S	60°C	50	30	25	10.5±1
4. Rinse the sample twice with cold water.
5. Dry at 60°C by hanging or by flat iron pressing but temperature should not less more than 150°C.

Shrinkage & Spirality Test:

Buyer's requirements:

Template size: 50cm & 35cm, 25.5cm & 18cm (meet after quick wash).

Shrinkage: length wise--- 5%

Width wise----5%

Spirality: Left ----- 5%

Right ----- 5%

**Procedure:**

At first take two ply of fabric & put the template (50cm) on to the fabric. The template has 8 holes. Both length & width wise the template holes can measure 35cm at 3 places. Then me mark the 8 holes by permanent marker & also at the edges of the template.

Then sewn the fabric & it is given to the washing m/c for run at 60°C for 60minutes with water. After that dry the sample & then measure the fabric

Spin speed --- 500r

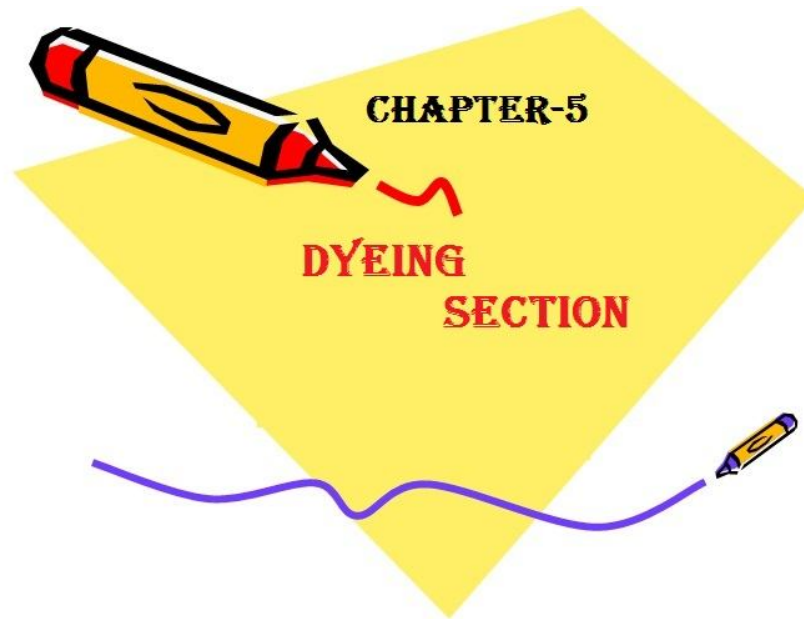
Drum speed--500rpm

P^H Test:**Procedure:**

Take 2gm sample fabrics and cut into small pieces. Then put it conical flask with 100cc water (M: L -1:50). Then shake it 15 min, then place it in a shaker m/c for 1 hmy. Then check P^H by P^H meter.

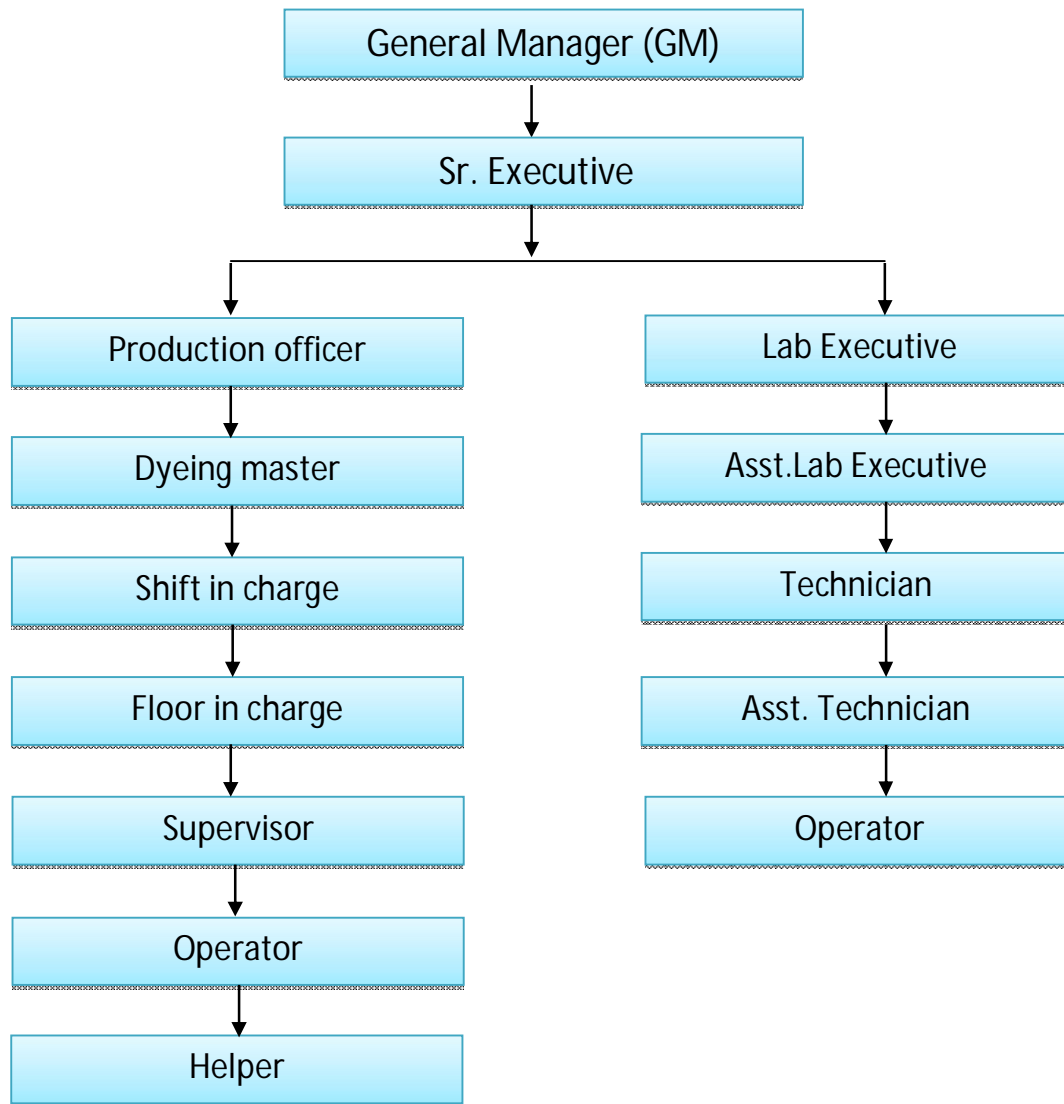
GSM Test:**Procedure:**

GSM is the most important factor. There is a GSM cutter. The sample cut by the GSM cutter andweighted in the electronic balance. The reading (in gm) from the balance is multiplied by 100 to get the value of GSM.

A yellow diamond shape is the background for the title. A red crayon is positioned at the top left, with a red squiggly line extending from its tip. A blue crayon is at the bottom right, with a blue squiggly line extending from its tip.

CHAPTER-5
DYEING
SECTION

ORGANOGRAM OF DYEING:



Types of Machine:

There Are Three types of Machine are used for Scouring, Bleaching & Dyeing the fabric:

- ⊗ Fong's Dyeing machine
- ⊗ D.H. Dyeing Machine
- ⊗ Kwang Dong Dyeing Machine

**DYEING MACHINERIS USED IN MAGPIE COMPOSITE
TETILE LTD.**

Srl NO	Machine Name	M/C Specification	NO of M/C
01	Fong's Dyeing Machine(Atmospheric)	M/c Model : ECO-38-4T Srl No:37030212 M/c Origin : SHENZHEN, CHINA M/c capacity : 800 kgs M/c Temp : 100 °C	01
02	D.H.® Dyeing Machine (Atmospheric)	M/c Model : DH 3500, DH3890 M/c Origin : SHEOL,KOREA M/c capacity :700, 200 kgs M/c Temp : 100 °C	02
03	D.H EURO HI-TECH Dyeing Machine(High Temperature)	M/c Model : DH3950 M/c Origin : SHEOL,KOREA M/c capacity : 1000, 60, 300kgs M/c Temp : 130 °C	03
04	Kwan Dong Dyeing Machine(High Temperature)	M/c Model : ET-230, 1800T M/c Origin : KOREA M/c capacity : 250, 500 kgs M/c Temp : 130 °C	02
05	GM38 Dyeing Machine(High Temperature)	M/c Model : 07003, 07004 M/c Origin : TAIWAN M/c capacity : 600, 1000 kgs M/c Temp : 130 °C	02

06	D.H EURO HI-TECH Sample Dyeing Machine(High Temperature)	M/c Origin : KOREA M/c capacity : 10, 50 kgs M/c Temp : 130 °C	02
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RAW MATERIALS FOR DYEING:

1. The raw materials for production - Grey Fabric
2. Dyes and Chemicals

GREY FABRICS:

Following types of grey fabrics are dyed –

- ✘ Single jersey
- ✘ Single jersey with lycra
- ✘ Polo pique
- ✘ Back Pique
- ✘ Single lacoste
- ✘ Double Lacoste
- ✘ Fleece
- ✘ Terry
- ✘ Mini Terry
- ✘ Interlock
- ✘ Rib
- ✘ Lycra rib
- ✘ 1 x 1 rib
- ✘ Collar & cuff
- ✘ Polyester fabrics etc.

Different Dyes used in Magpie Composite Textile Ltd.

No	Dyes Brand Name	Types	Smyce	Origin
1	Remazol Yellow 3GL	Reactive Dye	Dyestar	India
2	Remazol Blue BB	Reactive Dye	Dyestar	India
3	Remazol Yellow 3RS	Reactive Dye	Dyestar	India
4	Reactive Yellow RR	Reactive Dye	Dyestar	India
5	Reactive Red RR	Reactive Dye	Dyestar	India
6	White 4BK	Reactive Dye	Dyestar	India
7	Brighten RT-1015	Reactive Dye	Dyestar	India
8	Megaperse Yellow YNA	Reactive Dye	Dyestar	India
9	Megaperse Blue F2RL	Reactive Dye	Dyestar	Germany
10	Megaperse Navy NNA	Reactive Dye	Dyestar	Germany
11	Megaperse Blue FBL	Reactive Dye	Dyestar	Germany
12	Megaperse Yellow 3RHXF	Reactive Dye	Dyestar	Germany
13	Novacron Yellow FN-2R	Reactive Dye	Dyestar	Germany
14	NovacronBright Red FN-3GL	Reactive Dye	Dyestar	Germany
15	NovacronBlue -FNR	Reactive Dye	Dyestar	Germany
16	NovacronTurquoise-HNG	Reactive Dye	Dyestar	Germany
17	Novacron Yellow S-3R	Reactive Dye	Dyestar	Germany
18	Novacron deep Red S-B	Reactive Dye	Dyestar	Germany
19	Novacron Red FN2BL	Reactive Dye	Dyestar	Germany
20	Novacron Orange FN-R	Reactive Dye	Clariant	Germany
21	Novacron Navy FN-BN	Reactive Dye	Clariant	Germany
22	Novacron Ruby S3B	Reactive Dye	Clariant	Germany
23	Novacron Navy WB	Reactive Dye	Clariant	Germany
24	Novacron Ocean SR	Reactive Dye	Clariant	Germany
25	Drima TURQUISE CL-B	Reactive Dye	Clariant	Germany
26	Drima Navy CL-R	Reactive Dye	Clariant	Germany
27	Drima Blue -HF2B	Reactive Dye	Clariant	Germany
28	Imcozin Red E-3BF	Reactive Dye	Impo color	Germany
29	Imcozin Yellow E-3R	Reactive Dye	Impo color	Germany
30	Imcozin Blue E-NR	Reactive Dye	Impo color	Germany
31	Imcozin Orange E-2R	Reactive Dye	Impo color	Germany
32	Imcozin Navy blue E-RB	Reactive Dye	Impo color	Germany
33	Imcozin Blue -ERL	Reactive Dye	Impo color	Germany
34	Imcozin Navy Blue -E2G	Reactive Dye	Impo color	Germany
35	Imcozin Blue V-3 R 150%	Reactive Dye	Impo color	Germany
36	Imcozin Black VB	Reactive Dye	Impo color	Germany
37	Imcozin Yellow V4GL	Reactive Dye	Impo color	Germany
38	ImcozinTurquoise Blue VG	Reactive Dye	Impo color	Germany
39	Imcozin BR Blue VR(SPE)	Reactive Dye	Impo color	Germany
40	ImcozinGol Yellow VRNL	Reactive Dye	Impo color	Germany
41	Imcozin BRI Red V -F3B	Reactive Dye	Impo color	Germany
42	Ciba Navy NFB	Reactive Dye	HANNSMAN	MEA
43	Ciba Red FB	Reactive Dye	HANNSMAN	MEA
44	Ciba Yellow FN-2R	Reactive Dye	HANNSMAN	MEA
45	Cibacron Red -FN-3G	Reactive Dye	HANNSMAN	MEA
46	Cibacron Super Black -G	Reactive Dye	HANNSMAN	MEA
47	Liva Amber -CA	Reactive Dye	Dyestar	Germany
48	Liva Blue -CA	Reactive Dye	Dyestar	Germany
49	Liva Red -CA	Reactive Dye	Dyestar	Germany
50	Solacion Yellow HE-XL	Reactive Dye		

51	Reactive Black –GR	Reactive Dye		
52	Reactive Black –WNN	Reactive Dye		
53	Zeda Black –B	Reactive Dye		
54	Zeda Black –HFGR	Reactive Dye		
55	Zeda Red –ME4BL	Reactive Dye		
56	Zeda Yellow-MERL	Reactive Dye		
57	Bezactive Red S-2B	Reactive Dye		
58	Beza Yellow S3R	Reactive Dye		
59	Beza Blue SG LD	Reactive Dye		
60	Bezactive Blue V-2B	Reactive Dye		
61	Procion Crimson HE –XL	Reactive Dye		
62	Procion Navy HE –XL	Reactive Dye		
63	Procion Yellow HE –XL	Reactive Dye		
64	Procion Royal Blue HE-XI	Reactive Dye		
65	Sumifix supra Red E-XL	Reactive Dye		
66	Sumifix supra Yellow E-XF	Reactive Dye		
67	Sumifix supra Blue E-XF	Reactive Dye		
68	Sionzol Black B	Reactive Dye		
69	Reactive Red ME4 BL	Reactive Dye		
70	Taifix Black VSB –T 133%	Reactive Dye		
71	Taicron Yellow –HW-T	Disperse Dye		
72	Tai Yellow Brown –XF –T	Disperse Dye		
73	Taicron Crimson –XF –T	Disperse Dye		
74	Taicron Red –XF T	Disperse Dye		
75	Taicron Blue –HW –T	Disperse Dye		
76	Taicron Navy Blue –HW –T	Disperse Dye		
77	Taicron Black –HWT	Disperse Dye		
78	Taicron Blue –XF -T	Disperse Dye		
79	Terasil Red R	Disperse Dye	Swiss Color	Switzerland
80	Terasil G Yellow W3R	Disperse Dye	Swiss Color	Switzerland
81	Terasil Navy GRLC	Disperse Dye	Swiss Color	Switzerland
82	Terasil Black –SRL	Disperse Dye	Swiss Color	Switzerland
83	Dianix Blue –SBB	Disperse Dye		
84	Leucophor BSB	Brightener		
85	Syno White 4BK	Brightener		For Cotton
86	UVI Tex 2B	Brightener		For Cotton
87	UVITex HBV	Brightener		For Cotton
88	UVITex EBF	Brightener		For Polyester
89	Bluton -2B	Brightener		For Cotton
90	Leucophor –BMB	Brightener		

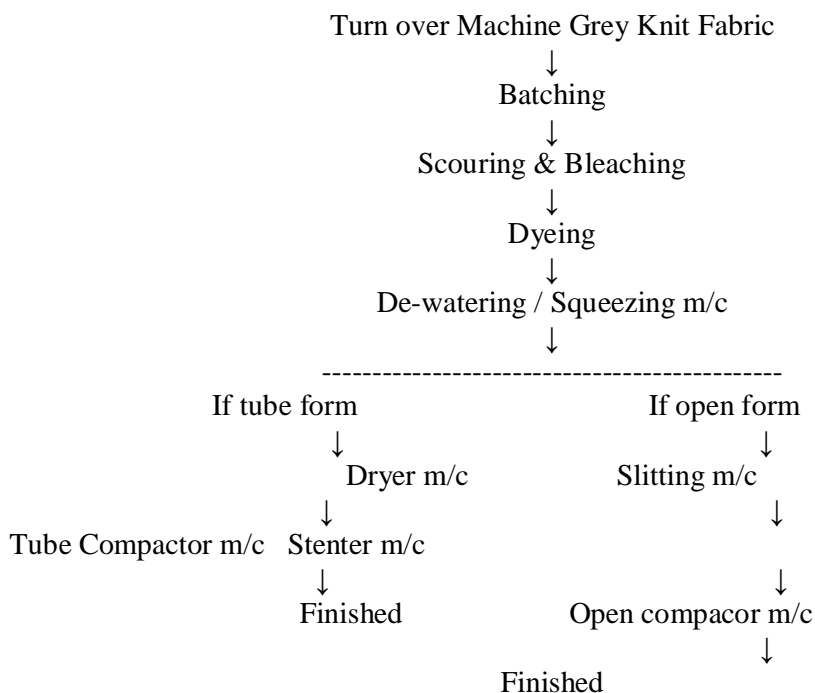
Chemicals used inMagpie Composite TextileLtd.

Sl. No	Category	Brand Name
1	Acid	Acetic Acid
		Sirrix – NE
		ECO Acid R
		Green Acid
		Core Neutracid – 100
		Cametic soda

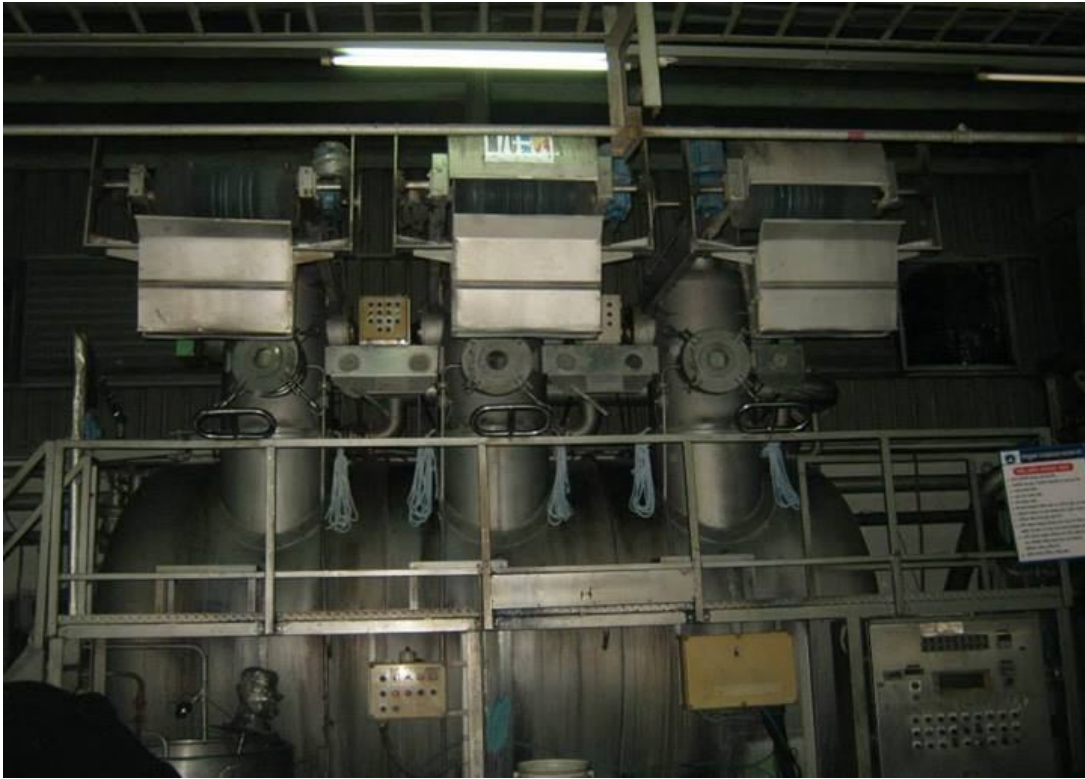
2	Alkali	Soda Ash
		Chemtech – ALF
3	Salt	Glauber Salt
		Common Salt
4	Enzyme	Bio – Polish EC
		Forylase DLS 255
		Biozymes-ECX
		Bio Polish – B II
		Mega – PH -20
5	Detergent	Sandoclean – PCLF
6	Sequesteren	Ledegen – QC
		Heptol – EMG
		Ladiquest – 1097
		Lanapex – HTS
		Iglazyme Acid MAX
		Jintexalate SQ - 117
		Texchehelate - 46
7	Per-oxide-Killer	Na –Thio-Sulphite
		Peroclean 50L Extra
		Jitler – Qak
8	Soaping Agent	Dekol – SN
		Jipsoap - RYK
		Eriopon – R
9	Anti-foam	Antimmepl - HTS
10	Anti - Crease	Breviol–PAM-N
		Depsolube-ACA
		Albafluid-C
		Primasol-JET
		Ciba fluid-C
		Lubrifiil-TFV
11	Dispersing agent	Satamol WS
		Palegal SFD
		Univadine -BIF
12	Stabilizer	Lanapex – HPST
		Stabilizer- B
13	pH buffer	Eulysin S
14	Fixing agent	Cyclanon ERL
		Cyclanon - FIA
		Optfix F (Direct)
15	Reducing agent	Hydros
16	Bleaching agent	Hydrogen per Oxide(35%)
17	Levelling agent	Drimagin E2R
		IrgasolCO NEW
18	Oil remover	Lanaryl - RK

19	Starch(Stiffening Agent)	Parapret VAS
20	Non ionic Softener	Softamine CL
21	Cat ionic Softener	Basosoft F-EUK
		Ceranine KWL
		Texamina C/SAL FLAKES
		Sapamine – CWS
		Sapamine KL
22	Silicon Softener	Adasil – ME -135
		Adasil – SM-1930
		Dowsil HMS
		Dowsil DCS
		SolmeoftWA
		Sandoperm ME
		Dowsil ME
		Mesoft – MASE
		Mesoft - CRC
		Dowsil MAX
		Tubiguard SR-Ultra
		Tubicoat FIX – FC
Tubicoat Fix Nano		

Flow chart for Knit dyeing process of M.C.T.L:



Dyeing Machineries of Magpie Composite Textile Ltd.



High Temperature Dyeing machine



High Temperature Dyeing machine



High Temperature Dyeing machine



Atmospheric Dyeing machine



Atmospheric Dyeing machine



Atmospheric Dyeing machine



Sample Dyeing Machine



Sample Dyeing Machine

RECIPE AT DIFFERENT DYEING:

Recipe for machine's heavy wash:

Detergent (Meteril ADW)	= 0.5 gm/L	60 minutes at 100 °C
Caustic	= 1 gm/L	
Hydrous	= 2 gm/L	

For machine neutralization:

Acetic acid	= (As required) gm/L
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Recipe for scouring and bleaching: :(For cotton)

Wettingagent (Invatex CRA)	= 1 gm/L	60 minutes at 100 °C
Detergent (Meteril ADW)	= 0.5 gm/L	
Anti creasing agent (Albafluid C)	= 1 gm/L	
Sequestering agent (Sirix 2Ud)	= 0.5 gm/L	
Caustic	= 2-3.5 gm/L	
Stabilizer (Clarite-CBB)	= 0.20 gm/L	
Hydrogen per oxide (H2O2)	= 2-4 gm/L	

Recipe for hot (cotton black):

Wetting agent (Invatex CRA)	= 1.5gm/L	30 minutes at 100 °C
Acid (acetic acid)	= 1.0 gm/L	
Caustic Soda	= 1.5 gm/L	

Recipe for enzyme treatment: :(For cotton)

Detergent (MeterilADW)	= 0.5 gm/L	60 minutes at 55 °C
Acid (acetic acid)	= 0.5 gm/L	
Enzyme (Enzyme SFR)	= 0.5-1.0 gm/L	

Recipe for leveling:(For cotton)

Leveling agent (Albatex DBC) = 1.0 gm/Anticreasing Agent (Albafluid C) = 0.25gm/L		10 minutes at 40°C
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Recipe for softening:

Acid (acetic acid)	= 0.10gm/L	30 minutes at 50°C
Softener(Sapamine CWS)	= 20 gm/L	

Sample Attachment (Dark, medium, Light Shade)

Common Dyeing Process for Light, Medium & Dark Shade of 100% Cotton Fabric:

Machine Wash:

Hydrose (2g/L) +Caustic (2g/L) +Foaming Agent (0.5g/L)

30 min at 90°c



Machine Washed



A. Acid (0.7g/L)

20min at 70°c



M/C Neutralized

Demineralization:

Detergent (1g/L)

Sequestering Agent (.5 g/L)

Ant creasing Agent (.5 g/L)

20min at 80°c



Scouring & Bleaching:

Detergent (1 g/L)

Sequestering Agent (.5 g/L)

Stabilizer (.8 g/L)

Caustic (3 g/L)

H₂O₂ (3 g/L)

60min at 98°c



Neutralizations (After Scouring & Bleaching):

H₂O₂ Killer (.8 g/L)

A. Acid (1 g/L)

20min at 80°c



Enzyme Wash:

A. Acid (1 g/L)

Enzyme (1%)

55min at 50°c, PH=4.5



Dyeing:

Ant creasing Agent (.5 g/L)

Leveling Agent (1 g/L)

A. Acid (.2 g/L)

Dyes (According to shade %)

G. Salt (According to shade %)

Soda Ash (According to shade %)

60min at 60°c



Neutralization: (Dyeing)

A. Acid (1 g/L)

10min at 40-50°c



Soaping:

Soaping Agent (.5 g/L)

20min at 70-80°c



Fixing & Softening:

Fixing Agent (.5 g/l)

15min at 40°c



A. Acid (.5 g/L)

Softener (1.5 g/L)

20min at 40°c



Bath Drain

Process curve for dark color shade:

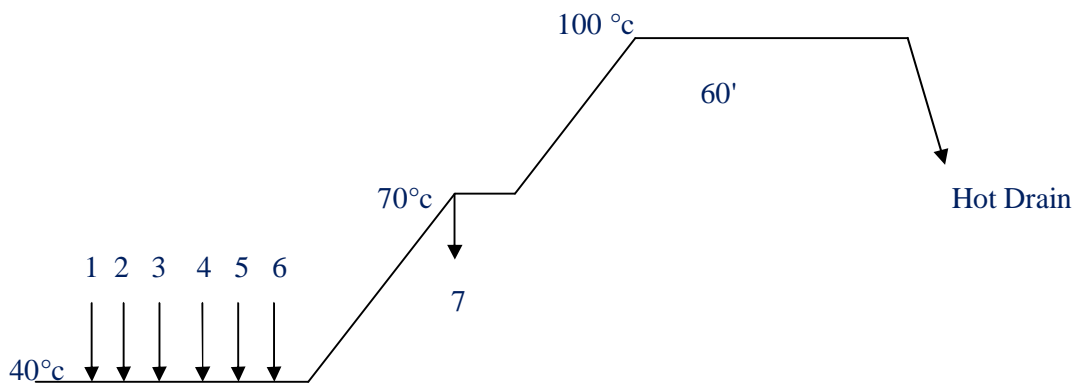


Fig: Process curve for scouring & Bleaching

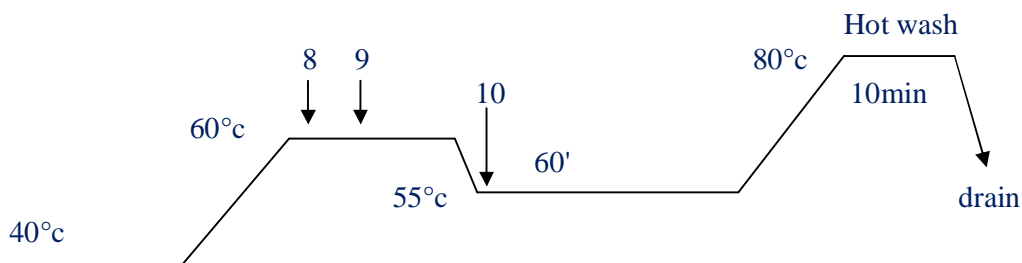
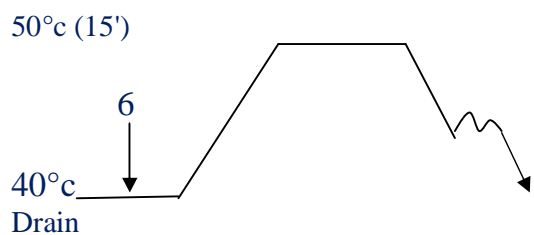
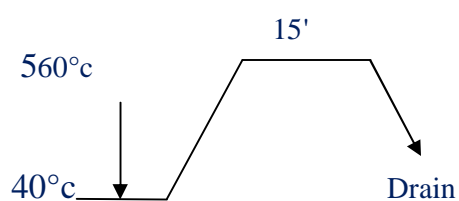
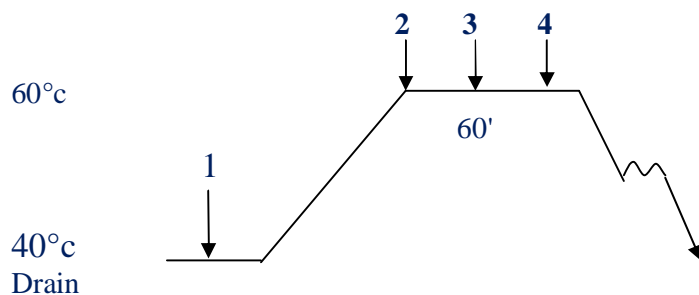


Fig: Process curve for neutralization

1. Wetting agent
2. Sequestering agent
3. Stabilizer
4. Anti foaming agent
5. Anti creasing agent
6. Caustic
7. Hydrogen peroxide
8. Peroxide killer
9. Acetic acid
10. Enzyme

Process curve for dyeing:

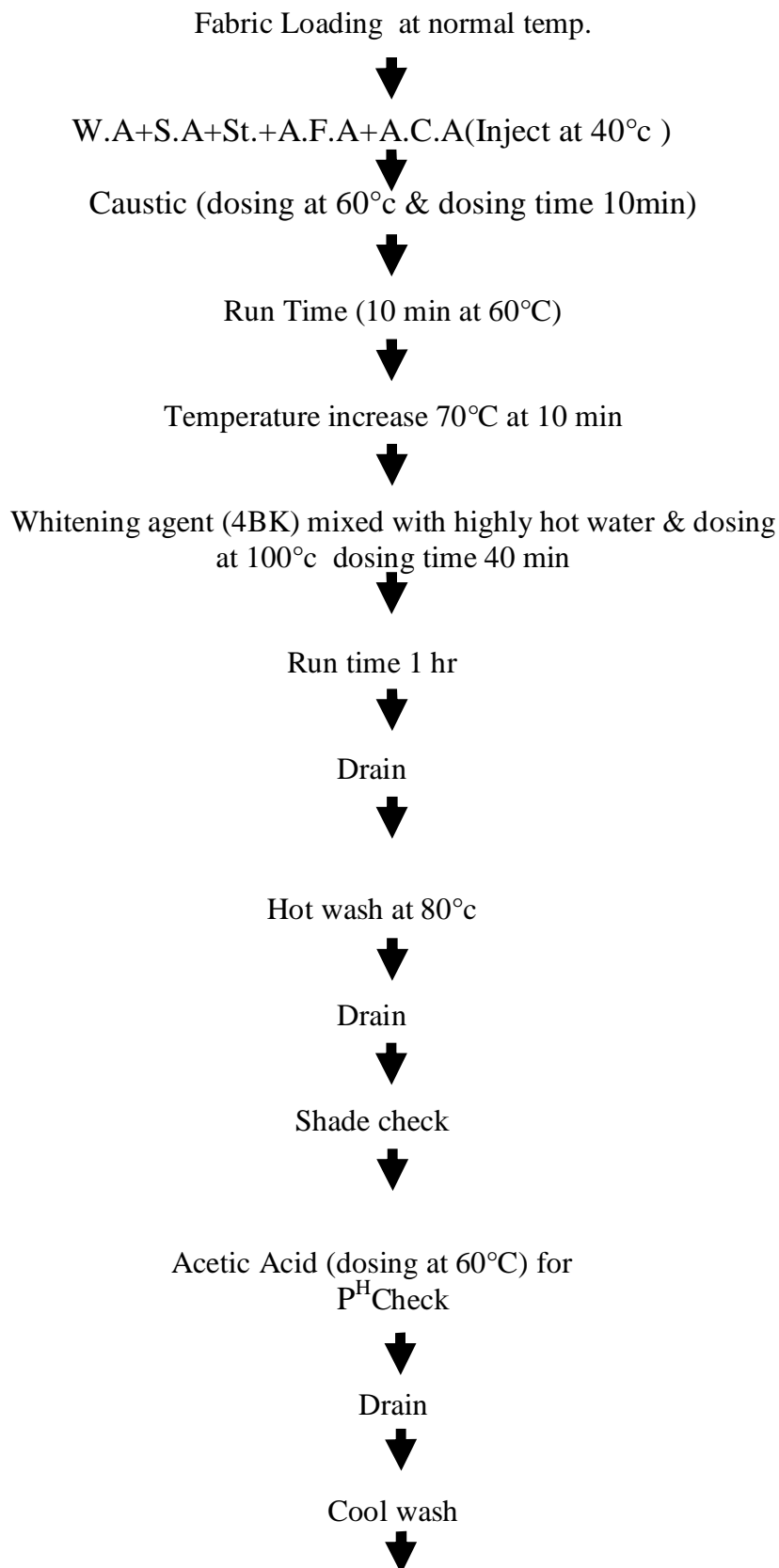


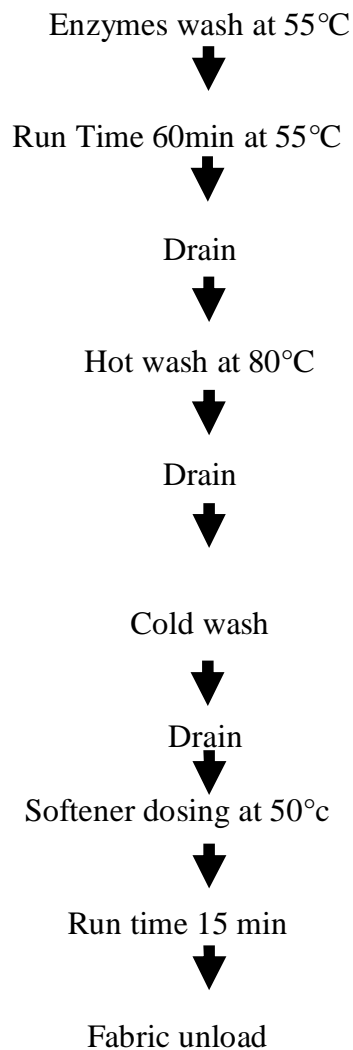
- 1. Leveling agent**
- 2. salt**
- 3. color**
- 4. Soda**
- 5. Acetic acid**
- 6. Softener**

Dyeing Recipe for White Shade (100% cotton)

Type of chemicals	Name of chemical	Dosing amount	
		Below 180 GSM	Above 180 GSM
Detergent agent Anticreaseing agent Acitic Acid Bio-polishing agent	LFD CONC	0.10 g/l	0.1 g/l
	P-100	1.50 g/l	2.00 g/l
	A/Acid	0.3-0.50 g/l	0.3-0.50 g/l
	Enzyme B-12	0.3-0.50 g/l	0.3-0.50 g/l
Detergent agent Anticreaseing agent	LFD Conc	0.4 g/l	0.5-0.6 g/l
	P-100	1.00 -1.50	2.00g/l
Stabilizer	ARGAPREP	1.00 g/l	1.00 g/l
Sequestering agent	MSS Conc		
Cametic soda	GS Conc	0.30 g/l	0.30 g/l
Optical Brightner Hydrogen peroxide	NaOH	2.50 g/l	2.50 g/l
	BTV		
	H2O2-50%	2.5-5.00 g/l	2.5-5.00 g/l
	H2O2-35%	3.50-7.00 g/l	3.50-7.00 g/l
Acitic acid Softening agent	A/ACID	1.0 g/l	1.00 g/l
	Sapamine CWS	0.3-1.50 g/l	0.30 -0.50 g/l

Dyeing Sequence for White Shade:





Process curve for White color:

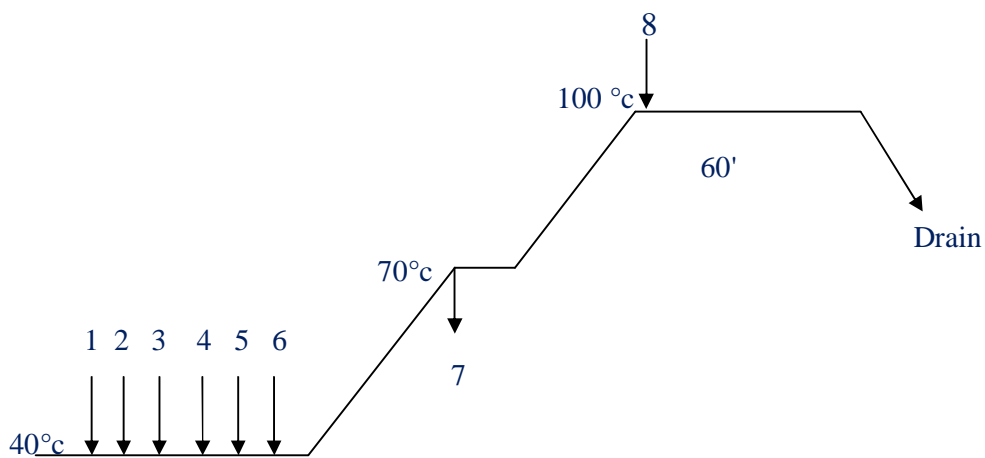


Fig: Process curve for scouring & Bleaching

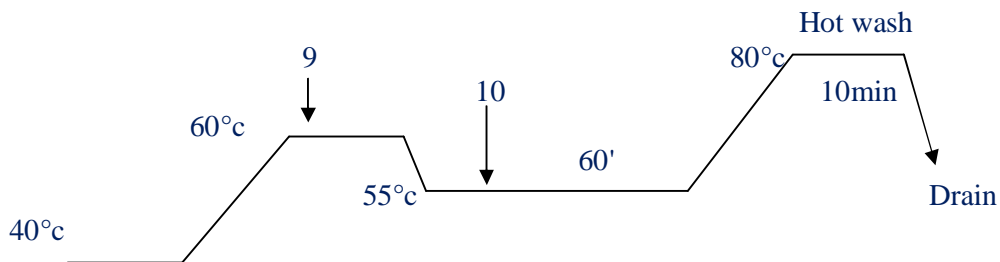
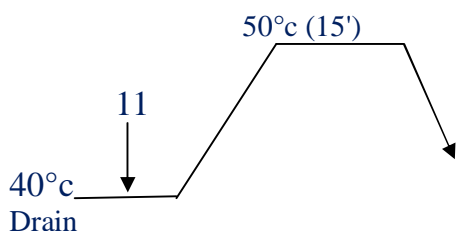


Fig: Process curve for whitening



- | | |
|------------------------|--------------|
| 1. Wetting agent | |
| 2. Sequestering agent | 10. Enzyme |
| 3. Stabilizer | 11. Softener |
| 4. Anti foaming agent | |
| 5. Anti creasing agent | |
| 6. Caustic | |
| 7. Hydrogen peroxide | |
| 8. Whitening | |
| 9. Acetic acid | |

DIFFERENT PARAMETERS IN DYEING:

P^H Levels for Different Stages of Cotton Dyeing:

- | | |
|---|--------------|
| 1. Initial Bath pH | ↪ 6.5~7.0. |
| 2. Before Enzyme, bath pH | ↪ 4.5~4.7. |
| 3. After Enzyme & Aquachoron ,pH | ↪ 5.5~6.0. |
| 4. Before Scmying& Bleaching, pH (With Enzyme) | ↪ 5.5~5.8. |
| 5. Before Scmying& Bleaching, pH (Without Enzyme) | ↪ 5.5~5.8. |
| 6. Scmying& Bleaching, bath pH | ↪ 10.0~10.5. |
| 7. After Scmying& Bleaching, pH | ↪ 8.5~9.0. |
| 8. Before Leveling Chemicals, pH | ↪ 6.5~7.0. |

- | | |
|--------------------------------------|--------------|
| 9. After Leveling Chemicals, pH | ↪ 6.7~7.0. |
| 10. After Adding Dyes, pH | ↪ 6.2~6.35. |
| 11. After Addition of Salt, pH | ↪ 7.5~8.0. |
| 12. After Addition of Soda, pH | ↪ 10.5~11.0. |
| 13. Before HotWash, Bath pH | ↪ 6.8~7.2. |
| 14. Hot Wash, bath pH | ↪ 8.5~8.7. |
| 15. Before Softener, bath pH | ↪ 7.2~7.8. |
| 16. After Softener Addition, bath pH | ↪ 6.5~6.8. |

P^H Levels for Different Stages of Polyester Dyeing:

- | | |
|--|--------------|
| 1. Initial bath pH | ↪ 6.5~7.0. |
| 2. Scmying, bath pH | ↪ 10.0~11.5. |
| 3. After Scmying, bath pH | ↪ 8.5~9.0. |
| 4. Before Addition of Leveling Chemicals, pH | ↪ 6.0~6.5. |
| 5. After Addition of Leveling Chemicals, pH | ↪ 4.5~4.7. |
| 6. After Addition of Colors, bath pH | ↪ 4.2~4.3. |
| 7. During Reduction Clearing, bath pH | ↪ 10.5~11.5. |
| 8. Before Softener, bath pH | ↪ 6.3~6.8. |
| 9. After Softener Addition, bath pH | ↪ 5.8~6.2 |

Temperature	
For cotton scmying	95-110°C
For cotton cold wash	40-50°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)

Table: Temperature at different Stage

Time	
For scmying and bleaching	60-90 mins
For reactive dyeing	60-90 mins
For disperse dyeing	60-90 mins

Table: Time at different Stage

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 dyeing

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 scumming, 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 fibres
- ❖ 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 exhamet 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-

- ❖ Mee 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:

- ❖ Me 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 metting 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.
- ❖ Insufficient 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

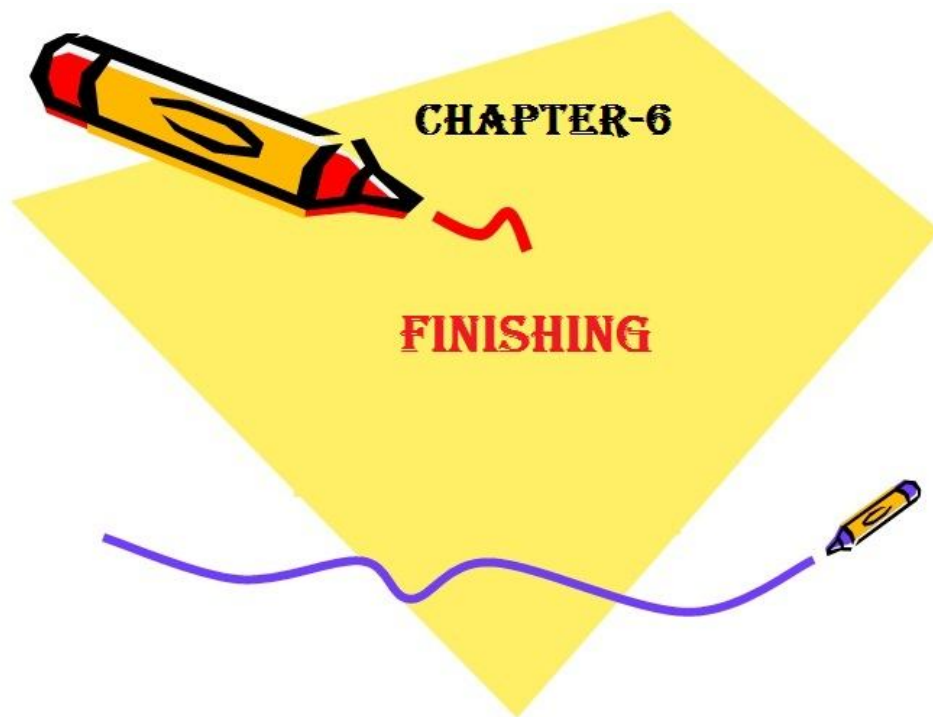
13. Softener Mark:

Causes:

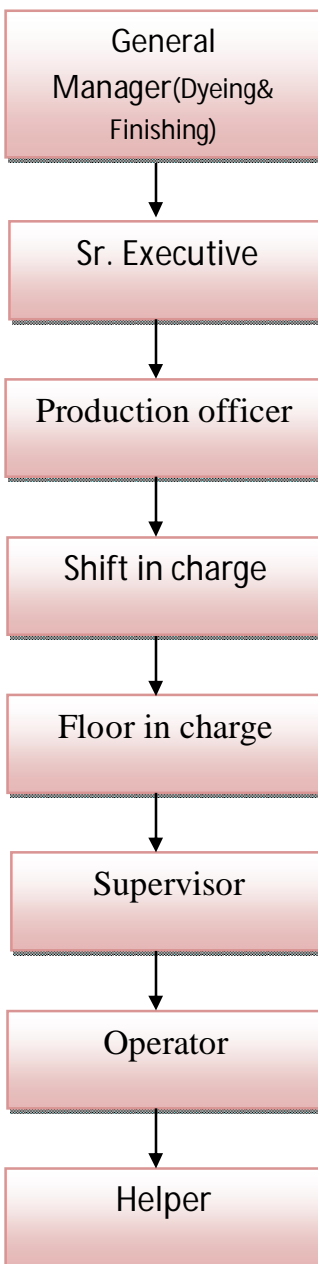
- ❖ Improper mixing of the Softener.
- ❖ Improper running time of the fabric during application of softener.
- ❖ Entanglement of the fabric during application of softener

Remedies:

- ❖ Maintaining proper reel speed & pump speed.
- ❖ Proper Mixing of the softener before addition.
- ❖ Prevent the entanglement of the fabric during application of softener.



ORGANOGRAM OF FINISHING SECTION:



Objective of Finishing:

Improving the appearance –Lmeter, whiteness etc of the fabric.

- ✘ Improving the fell which depends on the handle of the material & its softness.
- ✘ Mearing qualities, non-soiling, anti crease, anti shrink, etc
- ✘ Special properties required for particular uses, such as water-proofing, flame-proofing, etc
- ✘ Increase the weight of the cloth

Types of Finishing:

Chemical finishing

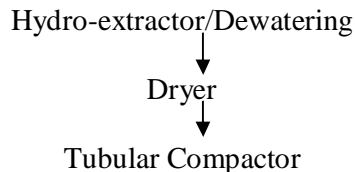
- ✘ Chemical reaction of auxiliaries with fibres
- ✘ Application of the handle modifying products/additives

Mechanical Finishing: Mechanical treatment with m/c

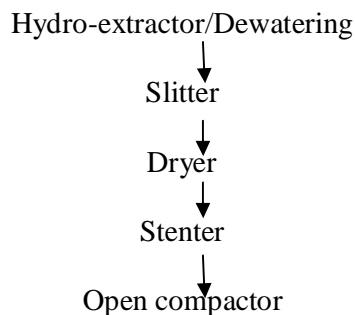
Finishing effects:

- ✘ Easy-care
- ✘ Crease recovery
- ✘ Dimensional stability
- ✘ Good abrasion resistance
- ✘ Improve tear resistance
- ✘ Good sew ability
- ✘ Soft or stiff handle
- ✘ Shine or luster

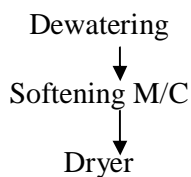
For Tubular form of fabric following m/c are required:



For open form of fabric following m/c are required:



For collar & cuff finishing following m/c are required:



Description of Finishing m/c:

Hydro Extractor m/c:

Manufacturer	:	Nazar Corporation (Pakistan)
Extraction%	:	65% Maximum
Speed	:	1400 rpm
Extraction time	:	5-7 min
Function	:	To remove the water from the fabric by centrifugal extraction.

Dewatering m/c:

Manufacturer: Alkan (china)

Function:

- Reduce water content
- Apply chemical
- Open the fabric from rope form

Controlling Parameters:

Padder pressure : 4-7 bar
Pick up % : 80-85%
Speed at m/c : 8-60 m/min

Chemical application:

Softener: To soften the fabric.

Equipment need: Following equipment are need for relax drying process:

- a) **Alkan(China)**
 - Gas burner heated.
 - 2 Chamber
- b) **Alkan (China)**
 - Steam heated
 - 2 chamber

Slitting M/C:

ALKAN Slitter m/c (Turkey)

Slitting:

Slitting is a process that is applied for cutting the tubular fabric through the intended break Wales line on lengthwise direction prior to stenter processing.

Machine parts:

1. **Rotary blade:** To cut the fabric through break Wales line.
2. **Ring:** To help cutting.
3. **Guide Roller:** To guide the fabric to plaiting.
4. **Plaiting:** To plait the fabric.
5. **Sensor:** Sense for cutting through break Wales line.

Stentering M/C:

Machine specification

ALKAN Stenter M/C

Upper feed roller rpm-80 max

Lower feed roller rpm-80 max

Burner -7*2=14

Function of Stenter:

- ❖ Heat setting.
- ❖ Width control, finishing chemical application.
- ❖ Loop control.
- ❖ Moisture control.
- ❖ Spirility control.
- ❖ GSM control
- ❖ Drying
- ❖ Shrinkage control

Standard operating parameter for different fabric in Stenter:

Fabric Type	GSM	Dia	Temperature	Over Feed	Padder Pressue	Speed (rpm)	Blomer rpm
Single jersey	115-150	2''+	110-140	40-45%	2 bar	30-35	1100-1300
Single jersey	160-220	2''+	120-170	40-45%	2.5 bar	25-30	1200-1400
Lycra Single jersey	160-200	4''+	130-160	50%	2 bar	25-30	1200-1400
Lycra Single jersey	200-250	4''+	140-160	50%	2 bar	24-28	1200-1400
Pique	160-200	3''+	130-160	40-45%	1.5-2bar	25-30	1200-1400
Lycra Pique	190-220	4''+	130-160	50%	2 bar	20-25	1200-1400
Fleece/Terr y	260-300	4''+	140-170	40-45%	2 bar	20-25	1300-1400
1x1 Rib	160-220	2''+	130-160	45%	2 bar	24-28	1300-1400
2x2 Rib	190-220	2''+	140-160	45%	2 bar	20-25	1200-1400
Interlock	190-220	3''+	130-160	50%	2 bar	20-25	1200-1400

*S/J fabric feed at 3-5 degree angle.

*Others fabric feed, straight.

Checking parameters:

- Shade Check
- width Check
- meight Check
- Fault Check

Compactor m/c:

Equipment need:

- Confident tubular compactor m/c (USA)
- Confident open compactor m/c (Turkey)

M/C set up: m/c set up for Compactor is given below:

M/C parameter	Set-up value
Temperature setting	90 ⁰ c-110 ⁰ c
Steam pressure	4-6 bar
M/C speed	3-35 m/min
Over feed	(-10-+40%)
Air pressure	5 bar
Cooling fan motor	Auto



Fig- Tubular compactor m/c



Fig. - Open compactor m/c

Checking parameters:

- Shade Check
- width Check
- meight Check
- Fault Check

**Squeezer:**

To squeeze the dyed fabric with the help of squeezer. Here excess water is removing from dyed fabric, sometime here mee softener for more hand filling.

Machine-Dong Nam Balloning Squeezer M/C(Korea)**Dryer:**

To dry the fabric by dryer m/c. Sometime here control the shade of the dyed fabric

Machine: TENSIONLESS DRYER M/C

Model : DNTD 2400(3L, 3CH)

Serial : DN 0642

Capacity: 1200-1500 kgs/day

Heat : 95-130°C

Back Sewing M/C

To back sewing open fabrics for dyeing or washing.

Machine: JIUH SHUENN M/C (Taiwan)

Model: JS-AESM 188

Air pressure: 7-8 kg/cm²

SWEDING M/C:

Machine: Laser-Turk (Turkey)

Model: CSMEV0111

Serial: 3CSM042-T

FINISHED FABRIC INSPECTION:

The following defects are found in the final inspection.

1. Uneven shade
2. Oil spot
3. Neps
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

Finishing Machineries of Magpie Composite Textile Ltd.



Figure :Back Sewing M/C



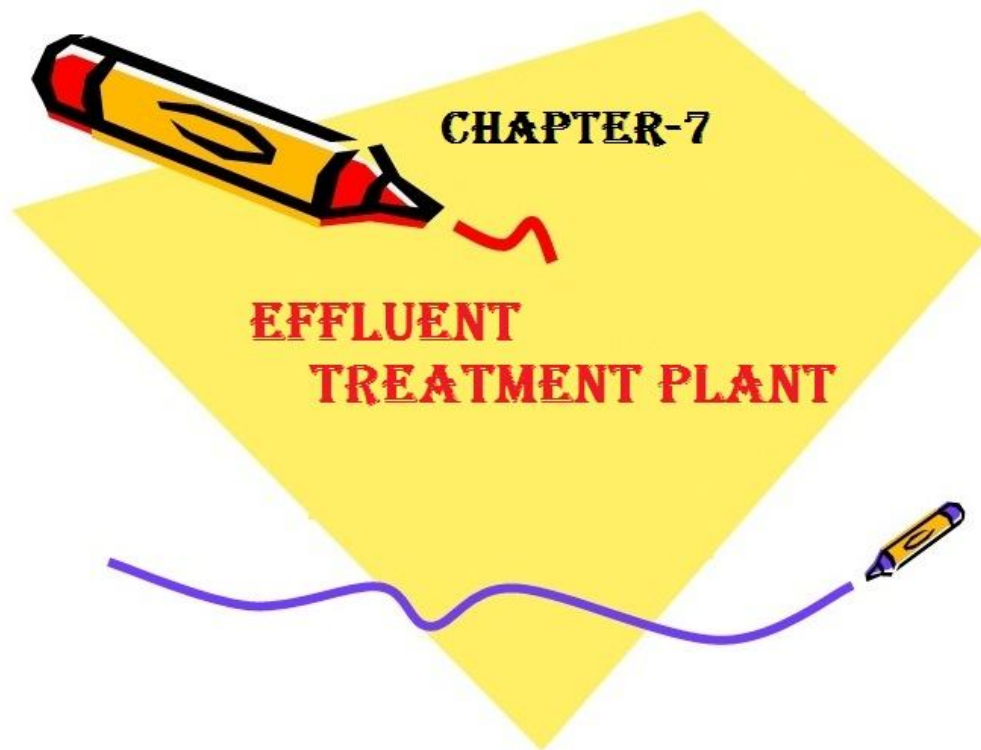
Figure :Squeezer M/C



Slitting M/C



Hydro Extractor

A large yellow diamond shape is the central focus. A red crayon is positioned at the top left, with a red squiggly line extending from its tip. A blue crayon is at the bottom right, with a blue squiggly line extending from its tip. The text "CHAPTER-7" is written in black, bold, uppercase letters at the top of the diamond. Below it, "EFFLUENT TREATMENT PLANT" is written in red, bold, uppercase letters.

CHAPTER-7

**EFFLUENT
TREATMENT PLANT**



Wastewater System Evaluation

Name of Industry:-MAGPIE COMPOSIT TEXTILE LTD.

Address:- 832/833,DEWAN EDRIS ROAD,AMTALA, KATHGARA,
SAVAR, DHAKA, BANGLADESH.

Phone:- 88- 02- 8962437

E-mail:- dyeingmct@magpiegroup.com

Contact Person:- M. ArifurRahman

Type of Industry:- TEXTILE BASED

Products manufactured:- KNIT FABRICS

Ratio of organic to inorganic waste _____: _____
(organic) (inorganic)

WASTEWATER CHARACTERISTICS

Parameters	Untreated wastewater	Treated wastewater (out of secondary)
Flow m ³ /day	1200-1400	1200-1400
pH	9.5	6.5-8.5
BOD (mg/lit)	400	<30
COD (mg/lit)	1200	<150
Total Dissolved Solids (mg/lit)	5000 (± 10%)	
Total Suspended Solids (TSS)	100	<30
Heavy metal (mg/lit)	NIL	NIL
Oil & Grease (mg/lit)		
Phenol (mg/lit)		
Sulphide (mg/lit)		
Chlorides (mg/lit)		
Ammonical Nitrogen (mg/lit)		

Details Of Existing Treatment Plant

Equalization tank capacity in m³ :- 650

P^H and type of mixing in Equalization tank: - 9.5 COARSE BUBBLE AIR MIXING

Neutralization tank capacity in m³:- 125

Type of mixing in Neutralization tank:- AIR MIXING

Primary Clarifier tank capacity in m³ :-

Additives added in the primary:- LIME, *FeSO₄*, POLYMER

Biological treatment

Anaerobic tank:- Yes No Capacity :

Aerobic tank:- Yes No Capacity : 500 m³

No. of Aeration tanks:- 02

Aeration tanks capacity in m³ :- 500 m³

HP & No. of Aerators:- 30 Kw 28 SETS IN EACH TANK

Dissolved Oxygen (DO) maintained:-

Percentage Recirculation of sludge in the secondary:-

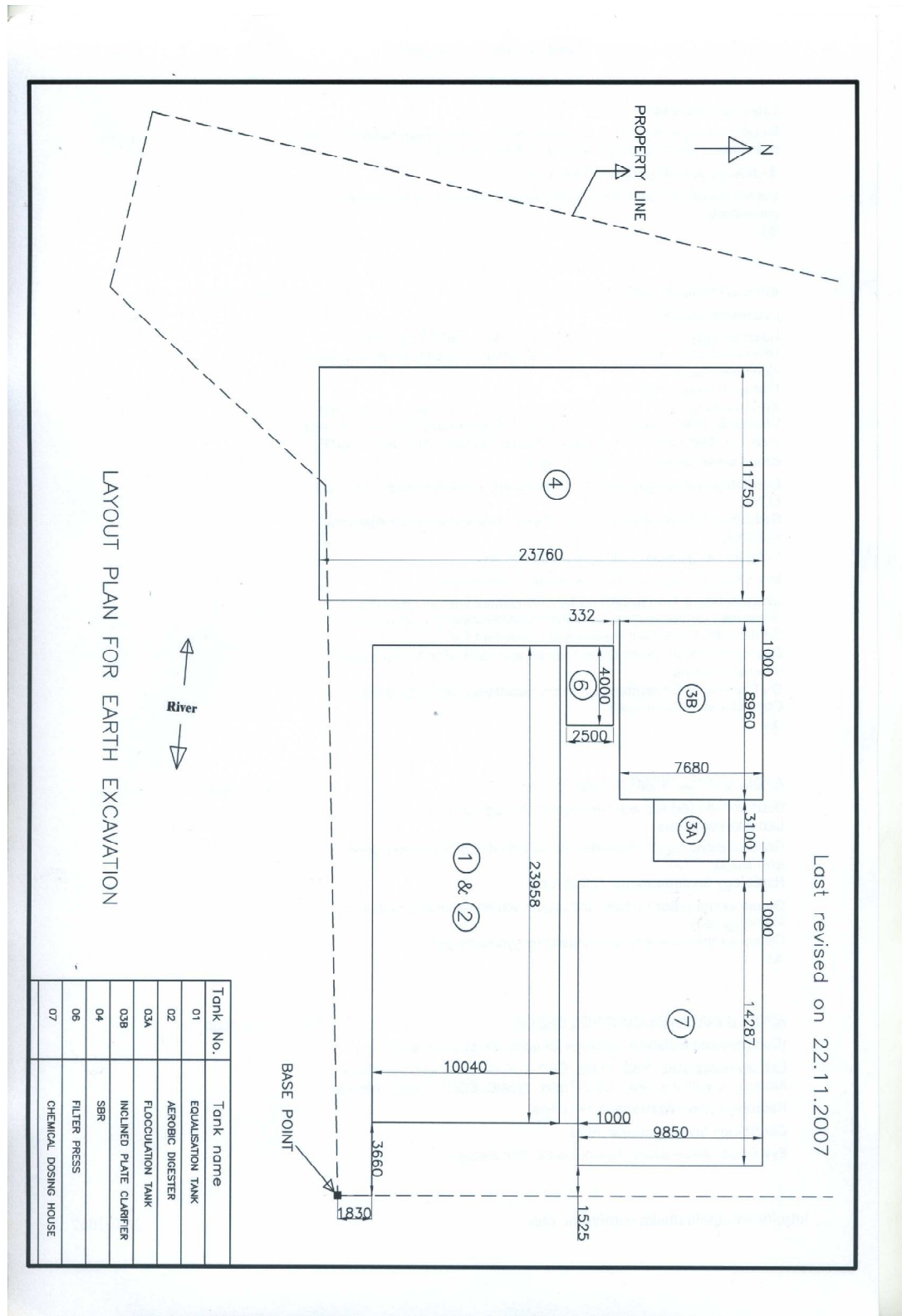
Frequency and quantum of sludge wasting from secondary: ONCE IN TWO DAYS

Mixed Liquor Suspended Solids (MLSS) maintained:-

Secondary Clarifier tank capacity in m³ :- NOT THERE

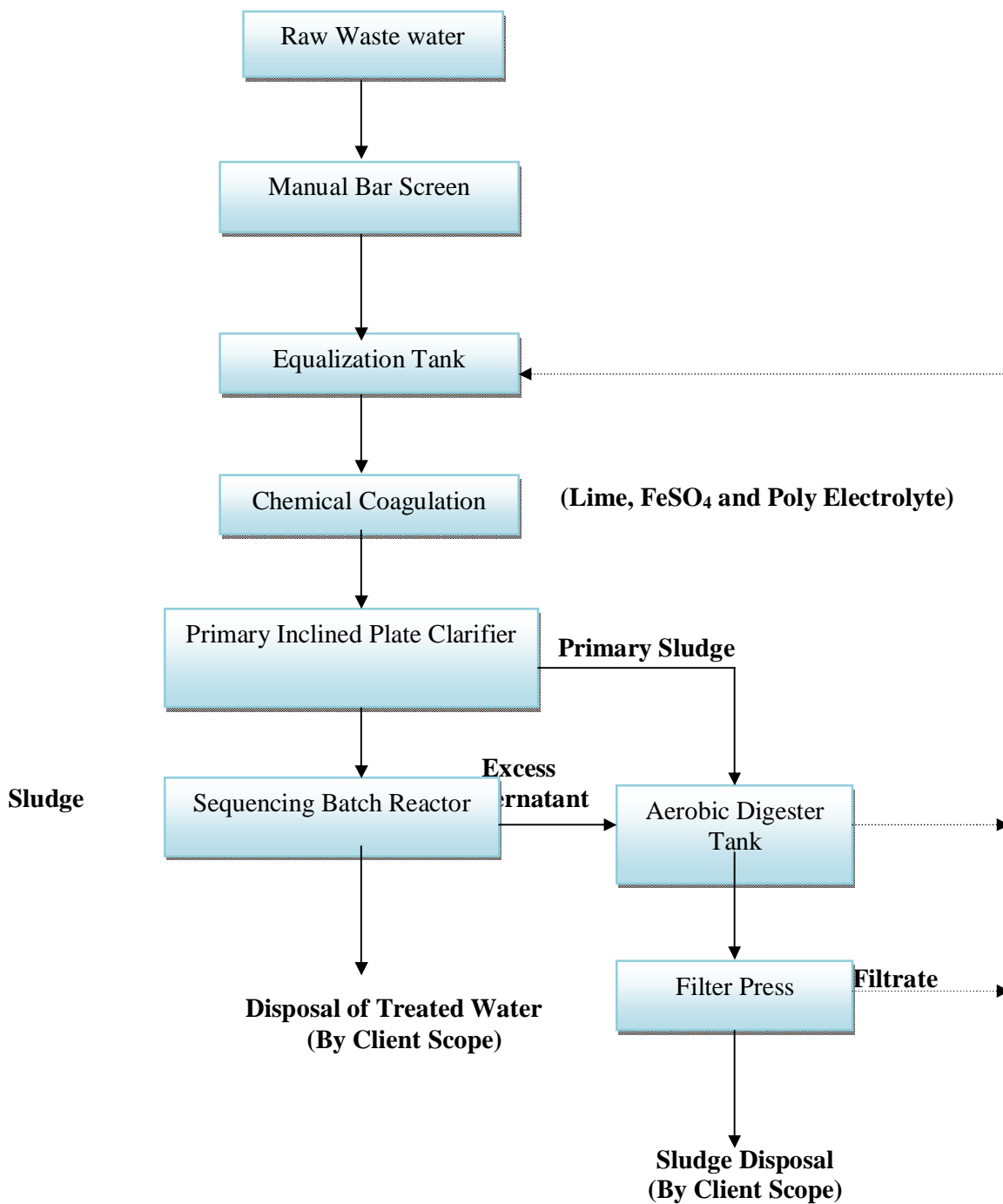
Nutrients added in the secondary NIL

LAYOUT PLAN OF ETP IN MAGPIE COMPOSIT TEXTILE LTD.:



Brief Description of ETP along with a Flow Chart:

TREATMENT SCHEME







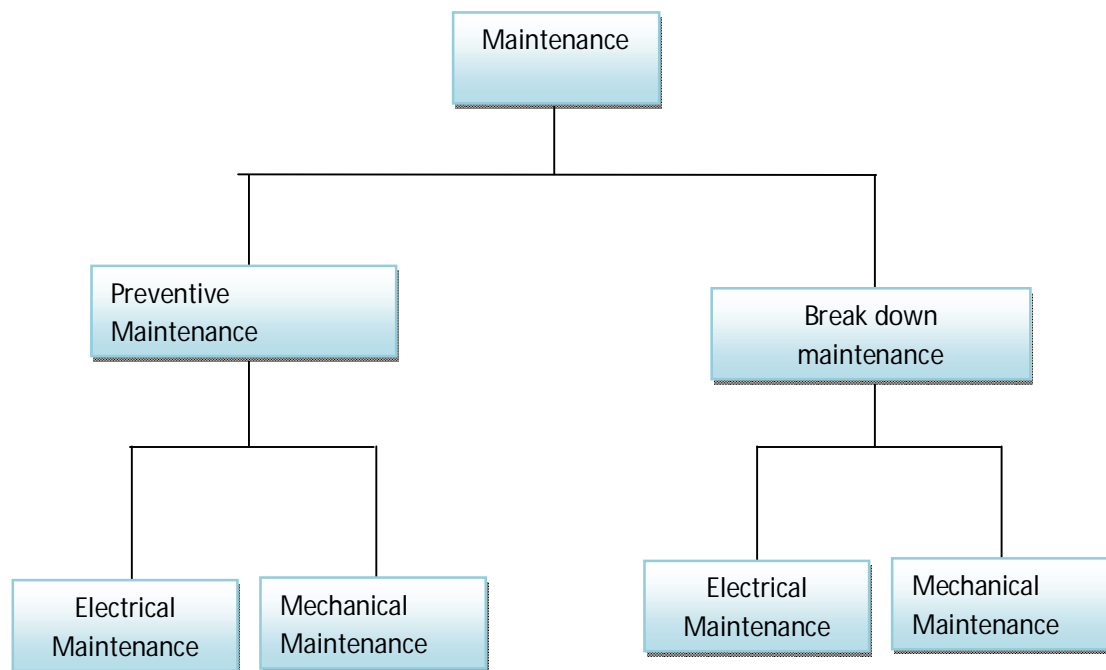
DEFINATION:

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

OBJECTIVES OF MAINTENANCE:

1. To keep the factory plants, equipments, machine tools in an optimum working condition.
2. To ensure specified accuracy to product and time schedule of delivery to customer.
3. To keep me downtime of machines to me minimum must to have control over me production program.
4. To keep the production cycle within the stipulated range.
5. To modify the machine tools to meet the need for production.

TYPES OF MAINTENANCE:



Preventive maintenance:

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

Break down maintenance:

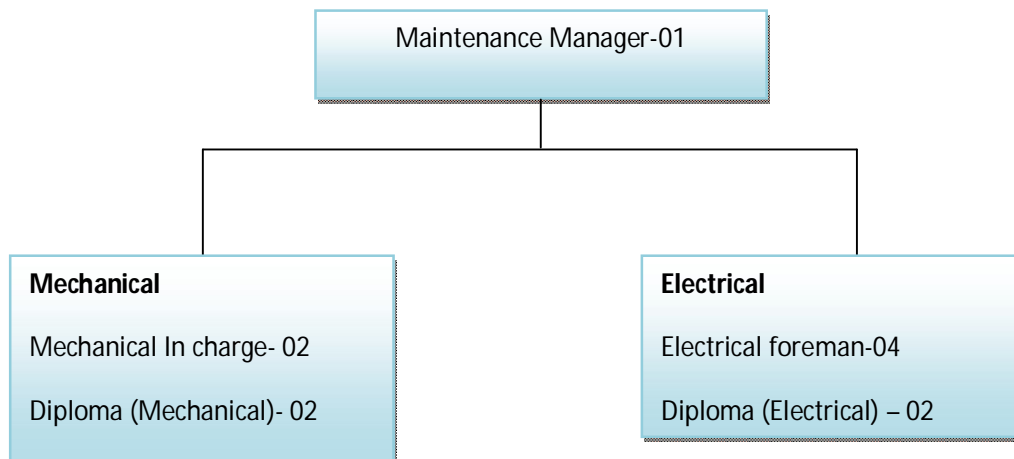
In this case, repairs are made after the equipment is out of order and it can not perform its normal functions.

Routine Maintenance:

Maintenance of different machines are prepared by expert engineer of maintenance department. Normally in case of dyeing machine maintenance after 30 days complete checking of different important parts are done.

MANPOWER SET-UP FOR MAINTENANCE:

• A Shift	8 AM	8 PM
• B Shift	8 PM	8 AM
• General Shift	9 AM	6 PM



MAINTENANCE PROCEDURE:

Normally preventive maintenance should be done. During maintenance procedure following points should be checked.

Check List of Different Parts:

Maintenance: Mechanical

Machine: Dyeing machine

Sl No	Items need to be checked & Serviced
01	Crease the M/C bearing.
02	Complete cleaning of machine.
03	Cleaning of drain valves, replace seals if required.
04	Check air supply filters, regulators auto drain seals
05	Clean filters element and blow out.
06	Greasing of unloading roller bearing.
07	Checking of oil level and bolts of unloading roller gearbox.
08	Checking of unloading roller coupling and packing.
09	Checking & cleaning (if required) of main vessel level indicator.
10	Check the oil level of pump bearing and refill if required.
11	Check the function of heat and cool modulation valves
12	Check all door seals

Maintenance: Electrical

Machine: Dyeing machine

Sl No	Items need to be checked & Serviced
01	Check & clean fluff and dirt at dirt at all motor fan covers.
02	Check all motor's terminals
03	Check main panels (by using compressed air)
04	Check panel cooling fan & clean its filter
05	Clean main pump inverter and its cooling fan.
06	Check all circuit breaker, magnetic conductors and relays.
07	Check current setting of all circuit breaker & motor over load.
08	Visual checking of all power & control cables.
09	Check all pressure switches.
10	Check calibration of main vessel & all addition tank.
11	Check all pneumatic solenoids
12	Check calibration of heating / cooling modulation value
13	Check setting of tangle sensor.
14	Check setting & operation of lid safely switches
15	Check all emergency switches
16	Check all indication lamps
17	Check all on/off switches
18	Check all signal isolators



MAINTENANCE TOOLS & EQUIPMENTS:

1. Combination tools / spanner

Function : Tightening & loosening of nuts & bolts.

2. Socket ratchet set

Function : Tightening of nuts & bolts

3. Slide Range

Function : Tightening & loosening of nuts & bolts

4. Monkey pliers

Function : Tightening & loosening of nuts & bolts

5. Pipe thread cutting tools

Function : To cut the thread in pipe.

6. Bearing puller

Function : To assist the opening of bearing from shaft.

7. Pipe range

Function : Tightening & loosening of pipe joint

8. Pipe cutting tools

Function : for pipe cutting.

9. Hole punch

Function : Punching the hole.

10. Divider

Function : For circle making on metal & wood.

11. Easy opener

Function : To open the broken head bolt.

12. External threat die

Function : For external threat cutting.

13. Heavy scissor

Function : Cutting of gasket & steel sheet

14. Pipe threat cutting tools

Function: To cut the threat in pipe.

15. Drill machine and drill bit.

Function : for drilling.

16. Grease gun

Function : For greasing of moving parts of M/C.

17. Grinding M/C

Function : For grinding & cutting of mild steel.

18. Welding M/C

Function : For welding & cutting.



19. Spirit leveler

Function : For perfect leveling.

20. File

Function : For smoothing the surface.

21. Hammer

Function : For scaling & Right angling.

22. Circlip tools

Function :Circlip opening & closing.

23. Hacksaw blade

Function: For metal cutting.

24. Handsaw (wood)

Function: For wood cutting.

25. Grinding stone

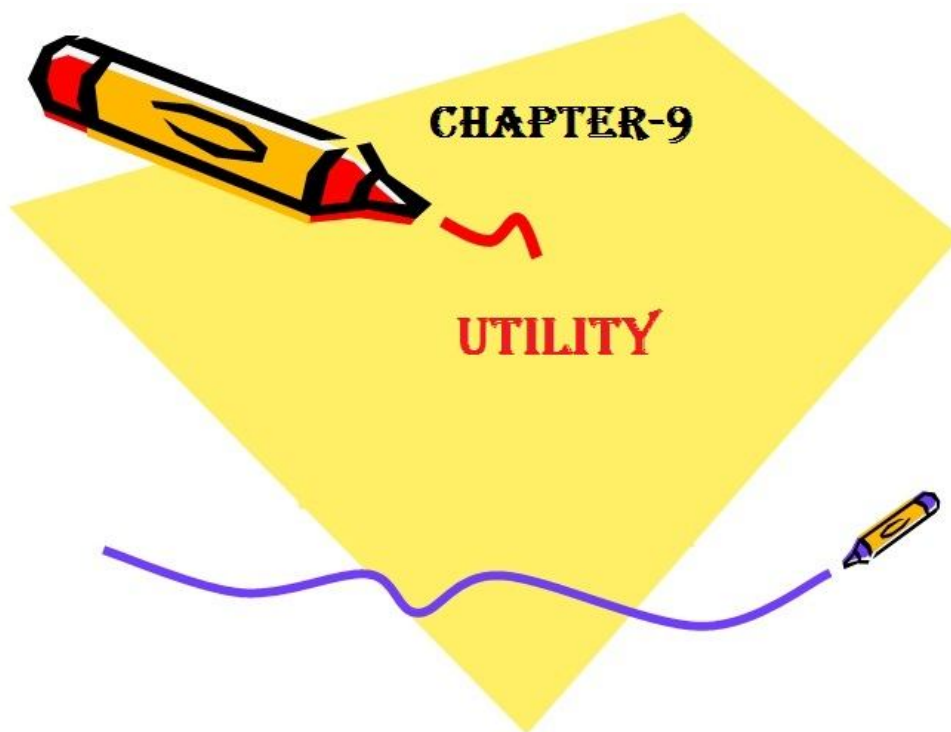
Function: For smooth finishing.

26. Grinding paste

Function: For easy cutting of metal.

REMARKS:

Maintenance of M/C's are very essential to prolong the M/C life and good maintenance is important consideration. It is necessary to check that all routine maintenance is being done regularly and properly otherwise efficiency of each department will be reduced.



UTILITY SERVICES

Here the following utility services are available-

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

WATER

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.P1 Unit and 5.5 H.P	1 Unit	1, 00L/min
5	Jhonson Pump (30 H.P)	2 Unit	100 m³/hr
6	KSB Pump (30 H.P)	1 Unit	100 m³/hr
7	Submerssible Pump KSB	46 Kw	150 m³/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 Underground. 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** : $\text{Ca}(\text{HCO}_3)_2$, $\text{Mg}(\text{HCO}_3)_2$, $\text{Fe}(\text{HCO}_3)_2$.

2) **Permanent hardness** : 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.
- ❖ Redeposition 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.

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(NO3)	< 50 ppm
Nitrate(NO2)	< 5 ppm

WATER SOFTENING:

There is ion exchange methods by which hardness of water is removed .

There is ion exchange methods by which hardness of water is removed .

The flow chart of water treatment plant is given below -

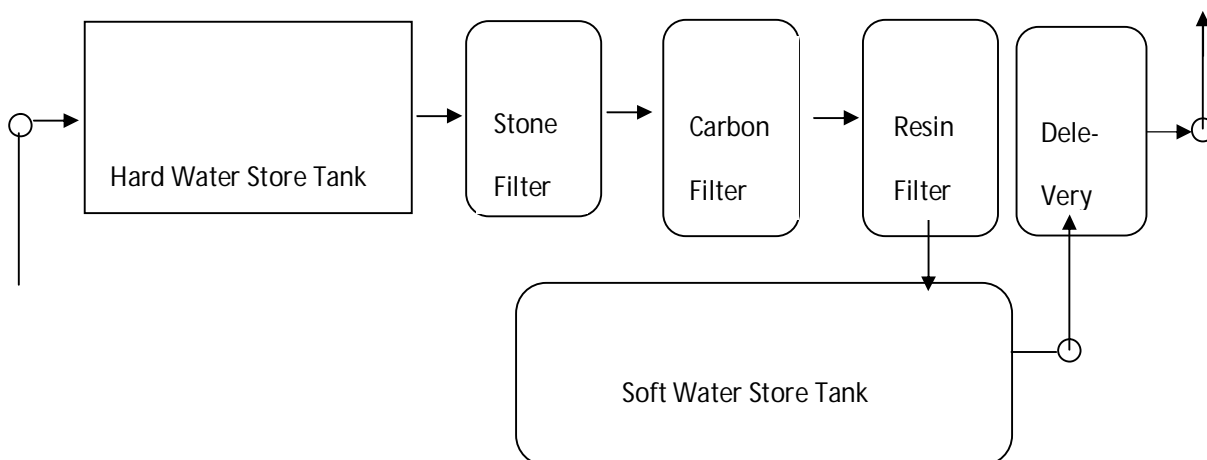


Fig: Water treatment plan

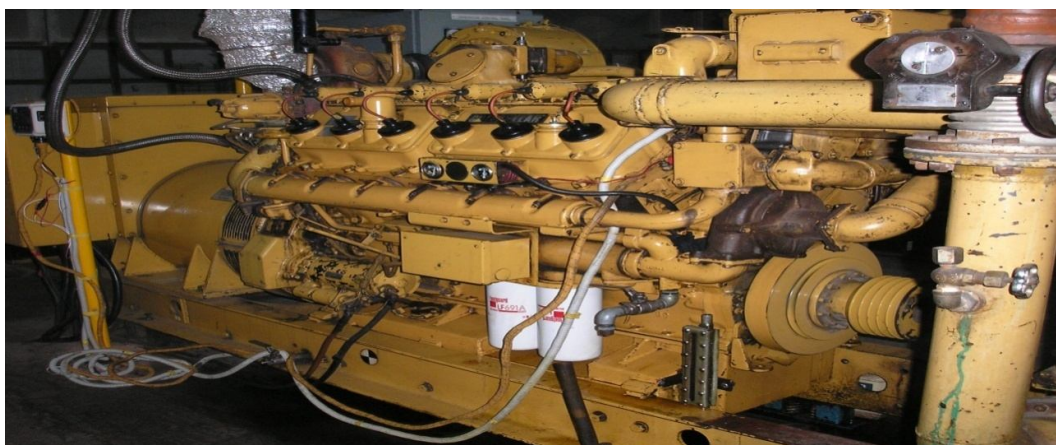
ELECTRICITY:

Sl. no	Machine description	Origin	No. Of Machine	Capacity
1	Chidong Gas Generator	China	1 No.	500 KW
2	Warsila gas Generator	France	1 No.	952 KW
3	Leroy somer Generation	India	1 No	640 KW
4	Sub – Station, Power Development Board(PDB)	Bangladesh	1 No	1000KVA

CHIDONG GAS GENERATOR:

Brand name	: CHIDONG
Origin	: China
Model	: 12V190ZDT-2
Standby Voltage	: 400 V, 795 KvA
Prime Voltage	: 500 Kw, 1208 KvA
Phase	: 3
Weight	: 12000 kg

DISEL GENERATOR	
Origin	: India
Brand Name	: LEROY SOMER
Model	: LSA49.1L9
SL No.	: L49.110022
Standby voltage	: 640 Kw, 750KvA
Prime Voltage	: 640 Kw, 800 KvA
Frequency	: 50 Hz
Phase	: 3
Weight	: 3800 kg



Generator

STEAM

Sl. No	Brand name of boiler	Origin	No. Of Machine	Capacity
1	Standard Kessel	Germany	1	12 Ton
2	Cleaver Brooks	USA	1	3 Ton
3	Cleaver Brooks	USA	1	10 ton/hr
4	Hurst	USA	1	470Kg/Hr

BOILER:

Brand Name	: KOMATSU
Origin	: Singapore
Model	: EGS 630-3
SL No.	: 30112
Standby voltage	: 440 Kw, 550 KvA
Max. Pressure	: 200 PSI



Boiler

AIR COMPRESSOR:

	Description of Machine	No. Of Machine	Capacity
1	Kaeser Screw compressor, Model AS44, 30 KW, 4 M ³ /Min each Origin – Germany	2 Units	8.00M³/Min
2	AIR PLUS. Screw Compressor. (LG Com.) Gms-37-52, Made in Korea	1 Unit	50.10 M³/Min
3	Ingersoll-Rand, Air Discharge - 8 M ³ /Min, Model No. 55R, ML-50, 57.5 KW	1 Unit	8.00 M³/Min
4	Kaeser Screw Compressor, Origin – Germany Model – CSD 102 Sl no. 9_5700_06_E	1 Unit	8.00 M³/Min
5	Atlas Copco ROTARY SCREW Compressor, GA 37-10, 10 BAR, India	2 unit	75 Hp/55 Kw

Air Dryer:

1	KAESER Air Dryer Machine, Model TE121, 5KW Years of Manufacture, 1998, Made in Germany	1 Unit	13.00M³/Min
2	JUCAI Air Dryer Machine, Model No. 100A	1 Unit	13.00M³/Min
3	Ingersoll-Rand Air Dryer, Model TMS 80.30 KW	1 Unit	6.00 M³/Min
4	Ingersoll-Rand Air Dryer, Model TMS 30.20 KW	1 Unit	3.00 M³/Min
5	Kaeser Air Dryer, Origin – Germany Mode TE – 141	1 Unit	13.00M³/Min
	Act 80 T, Italy	2 unit	9000 L/min



Compressor

GAS:

PPCes natural gas from Titas Gas Transmission Company. Gas is used as the fuel of Boiler, Generator and also used for heating dryer, Stenter and compactor m/cs etc.



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.

LIST OF COMPLIANCE ISSUES:

Here is the 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 abusement policy
- ❖ Working hour policy
- ❖ Hiring /recruitment policy
- ❖ Environment policy
- ❖ Security policy
- ❖ Buyers code of conduct
- ❖ Health and safety committee
- ❖ Canteen

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
- Welfare officer

OTHERS

- ❖ Room temperature
- ❖ Lighting facilities



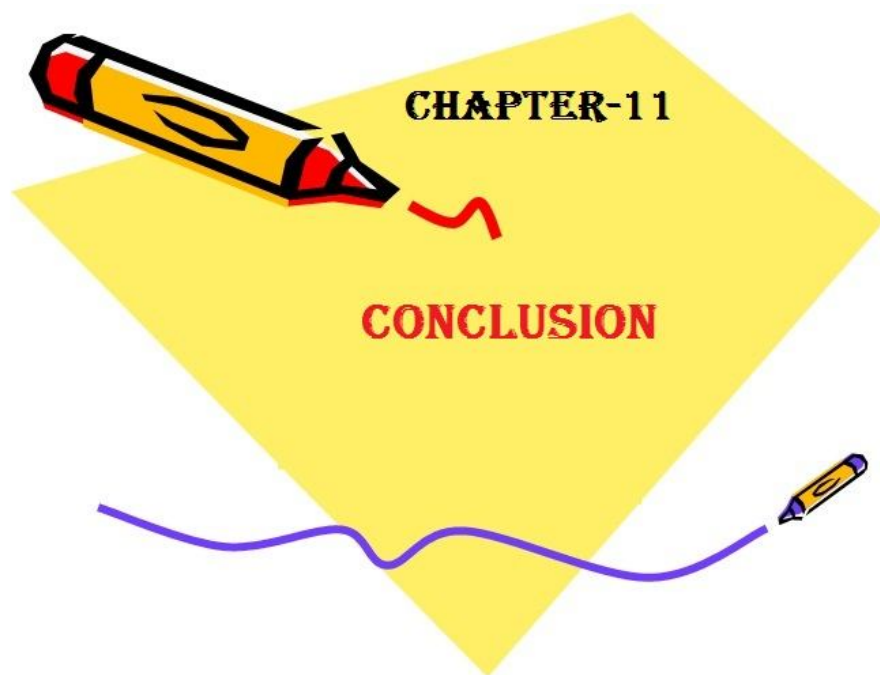
Picture-33 : Doctor



Picture-34: First aid box



Picture-35: Fire training





Conclusion:

MAGPIE COMPOSIT TEXTILE 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 **MAGPIE COMPOSIT TEXTILE 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 labour should be used in a project as **MAGPIE COMPOSIT TEXTILE LTD.** Many times the dosing pipelines are clogged due to the careless dosing of chemicals.
- ❖ The M/C stoppage time should be analysed and minimized. The maintenance should be carried out when the M/C is out of action.

LIMITON OF THE REPORT:

- ❖ Because of secrecy act the data on costing and marketing activities has not been supplied & hence this report excludes these chapters.
- ❖ We had a very limited time in spite of our willing to study more details it was not possible to do so.
- ❖ 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.

LASTLY:

What special in 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 **MAGPIE COMPOSIT TEXTILE LTD.** at a single look on it. The newcomer can use this report for further detailed study or can know **MAGPIE COMPOSIT TEXTILE LTD.** without much work. But what



should be remembered the chemical, some process steps may be modified within the pinned this papers goes the reader.