



Faculty of Engineering
Department of Textile Engineering

REPORT ON

Industrial Attachment

At

METRO KNITTING AND DYEING MILLS LTD

Fatulla

Course Title: Industrial Attachment

Course Code: TE-410

Submitted By

Nadim Parvej

ID: 103-23-2204

Academic Supervisor

Mohammad Abdul Baset

Senior Lecturer

Factory Supervisor

Md. Majharul Islam

Factory Manager

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

Advance in Apparel Manufacturing Technology

Duration: From 1st October , 2014 to 1st December, 2014.



Acknowledgement

At first I want to give thanks to God who gave me my life. I am here for this reason. For blessing God I complete My Industrial report.

I am greatly indebted to many people who helped me lot for preparing this industrial attachment. Their guideline, advice and suggestions helped me a lot. At first, I would like to thank Dr. Md.Mahbubul Haque, Head of the department of Textile Engineering, Daffodil International University whose directions have taken me to my destination.

I am also grateful to Engr. M.A Baset, Senior Lecturer and department of Textile Engineering, Daffodil International University for his scholastic guidance, constructive criticism, painstaking help constant inspiration and advice from the very beginning till the completion of this work.

Finally, the authority of the Metro Knitting and Dyeing Industry, Who gave me opportunity to complete my industrial attachment with great success, is remembered with honor over here. Thanks goes to all Engineers, officers, technicians, employees, stuffs, all section in-charges for their cordial behavior and help & especially Factory Manager (Majharul Islam) Metro Knitting and Dyeing mills Ltd.

Finally, I like to express my gratitude and appreciation to my parents for their blessing, support and love.

Declaration

I am declaring that this Industrial Attachment report is submitted for fulfillment of the requirement of B. Sc in Textile Engineering Degree of Daffodil International University. I completed the paper with the help of the employees of Metro Knitting and Dyeing . I collected all information during my internship period. All information in this paper is genuine & correct. I do ensure that no part of this paper is directly copied from others.

Report prepared by

ID

Signature

Nadim Parvej

103-23-2204

Index

Introduction	1
1.1Introduction	2
1.2Factory Address	3
1.3 Factory Profile:.....	3
1.4ABOUT MATRO KNITTING AND DYEING MILLS.....	3
1.4.1Quality Policy	4
1.4.2On time shipment	4
1.4.3COMBINED PROFILE	4
1.4.4COMBINED PRODUCTION CAPACITY	4
1.4.5IN HOUSE FACILITIES	5
1.4.6GARMNETS.....	5
1.4.7UTILITY:	6
1.4.8COMPANY PROFILE	6
1.4.9PRODUCT RANGE	6
1.4.10 Founder& director	7
1.4.11Product growth	8
1.5 Organo Gram Charts Metro Garments	8
1.6 Products	9
1.7 Buyers Name:.....	10
1.8 LIST OF MACHINERIES: METRO & BEA -CON.....	11
Description of the Attachment	17
2.1.1 Knitting Machine layout at Metro Textile:.....	17

2.1.2 Machine Description of Metro knitting and dyeing mills:	18
2.1.3 Main parts of a circular knitting machine:	20
2.1.4 Layout of Flat bed knitting Machine in Matro Textile:	21
3.1.6. Machine description of Flat bed knitting machine in Padma Textile:	21
2.1.5Some Sample of fabrics are as follows.....	23
:	23
2.1.6Production calculation:	24
2.1.7This inspection is pointed by 4 point system.....	25
2.2.1Description of the main parts is as follows –	26
2.2.1 Batch Preparation:	28
2.2.3 Objective of Batching:.....	28
2.2.4PH range at different stages of production:	29
2.2.5Flow chart of Pre-treatment (Scouring/Bleaching) process of cotton:	29
2.2.6Whitening Process:	31
2.3.1Metro Garments Cutting Section:.....	33
2.3.2Layout of Metro cutting section:	33
2.3.3Process sequence of cutting room.....	33
M/c used in cutting section:	35
2.3.4Metro Garments Sewing Section:	36
2.3.5 Layout of sewing section:.....	36
2.3.6 Process sequence of sewing section (T-shirt):	36
2.3.7 Machine Name – Needle Type:.....	37
2.3.8Different types of sewing machines:	38
2.3.9Layout of Sewing m/c:	40
2.3.10Metro Garments Finishing Section:	41

2.3.11 Finishing Layout of Finishing Section:	42
Machine Specification:	43
2.4.1 Garments Washing:	46
2.4.2 Lay out of Washing Section:	47
Machine Specification:	47
Maintenance	49
2.4.3 Types of maintenance:	49
2.4.5 Evaluation of maintenance performance	52
2.4.6 Store & Inventory control:	52
Layout of Store Section	53
Advantages of inventory control:	53
Procedure for inventory control:	54
Control of stores issue:	54
3. Impact of Internship	55
3.1. Knitting:	56
3.2. Dyeing:	56
3.3. Garments Cutting Section:	56
3.4. Garments Sewing Section:	57
3.5. Garments Finishing Section:	57
3.6. Garments Washing Section:	57
3.7. Maintenance:	57
3.8. Store:	57
4. Conclusion:	59

Introduction

1.1 Introduction

If the theoretical knowledge is a glass of water then the practical knowledge would be drinking of the water. It is always very easy to make a man understand about a firebox by showing and lighting practically rather than describing theoretically who has not ever seen a firebox. So, for any technical education the practical experience is the most important as well as the theoretical knowledge.

As I am studying in a technical line, it is always important for us to gather the practical knowledge. Through my study life the only biggest chance for me to combine the theoretical knowledge with the practical knowledge is the Industrial Attachment period that comes only once in the education life. So I can easily realize the importance of Industrial Attachment. And in addition the knowledge we gathered from the industrial training reflects in the report of industrial attachment note book.

So industrial attachment is the process where the trainee can blend his theoretical Knowledge with practical knowledge increasing his/ her ability of work, stillness, performance and attitude and so on. It also provides sufficient knowledge about production management, productivity evaluation, work study & efficiency, industrial management, production planning and control, production cost analysis, inventory management, maintenance and so on. Industrial attachment makes us reliable to be accustomed with the industrial atmosphere and also improve courage and inspiration to take self-responsibility.

I am try my best to prepare this note book applying my best efforts. I try to gather all the necessary information to make it a valuable for me as well as for everyone. I think it will help me a lot in future in my practical life.

1.2 Factory Address

Metro knitting and dyeing mills ltd
Ramarbag, Kutubpur, Fatullah,
Narayangonj-1400 Bangladesh

1.3 Factory Profile:

➤ CORPORATE HEADQUARTERS:

Corporate Head Office
House#19 Road#16
Block#B Banani
Dhaka-1213
Bangladesh
Email: info@metro.com

1.4 ABOUT MATRO KNITTING AND DYEING MILLS

Metro knitting and dyeing mills ltds

Is a very prominent name in the knitwear, 100% export oriented composite industry of Bangladesh. It is a most sophisticated plant equipped with highly modern machineries mostly imported from Germany, USA Sweden Japan Taiwan and Turkey using the latest technology and experienced personnel. It has been running since first September 2000 and it produces world class all knit fabric and knit garments.

1.4.1 Quality Policy

Our QAD and RQS department are high concern to ensure quality product and standard enough to meet the requirement of each buyer.

1.4.2 On time shipment

Our every production policy aimed for on time shipment of goods.

We maintain a good stock of yarn, dyes and chemical

Centralized planning department for production planning

Own goods transport facility equipped with GSP vehicles tracking system

1.4.3 COMBINED PROFILE

COMBINED PROFILE OF

Metro knitting & Dyeing Mills Ltd.

Metro Knitting & Dyeing Mills Ltd. Factory -2

Bea-con knit wear Ltd

Bea-con Knit wear Ltd. Factory -2

Mercer Design Tex Ltd.

Years in Business: 14 years

Number of employee: 10550

1.4.4 COMBINED PRODUCTION CAPACITY

Garments: 3.7 million pcs/ month

Number of line: 95 Lines

Knitting: 700ton/month

Narrow fabric: 400000yards/month

Dyeing: 850ton/month

Washing: 1million pcs/month

Allover print: 135 ton/month

Screen print: 3million pcs/month

Embroidery-Logo: 1 million pcs /month

-applique: 0.4 million pcs/ month

1.4.5IN HOUSE FACILITIES

TEXTILE

Knitting

Dyeing

Finishing

Brushing

Washing plant

Narrow fabric

.

4.4.6GARMNETS

CAD, CAM, and Computer aided R& D section

Cutting section with

Gerber Automatic spreader & cutting system

Sewing

Finish

PRINTING & EMBROIDERY

All over printing with Auto printing M/C

Screen printing with multi color auto printing M/C

1.4.7 UTILITY:

24 hr power generator support

ETP & WTP Facility

4.4.8 COMPANY PROFILE

Number of employee: 4700

Production floor space: 66800 SFT

Production Capacity

Garments: 1.1 million pcs/month

No of production line: 28 line

Knitting: 700 ton/ month

Narrow fabric: 400000yars/month

Dyeing: 850 ton/ month

Allover print: 135 ton/ month

Washing plant: 1 million pcs/ month

1.4.9 PRODUCT RANGE

Dress & skirts: jacket

Blouse ladies: Hooded

Infant/toddler: Fleece jacket

Knit shirts: Modal items

Organic apparel: viscose apparel

Shorts: Grey & finish

T-shirts: all type of knit items

1.4.10 Founder& director

Managing Director & Founder

Amal Podder

Director

Ranabir Roy

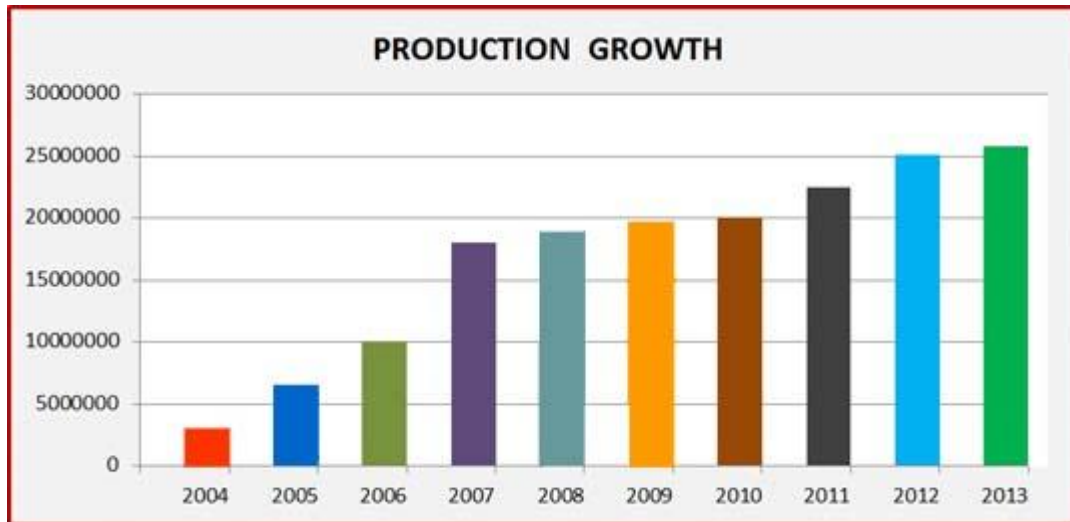
GM Marketing & Merchandising

Md. Bazlur Rahman

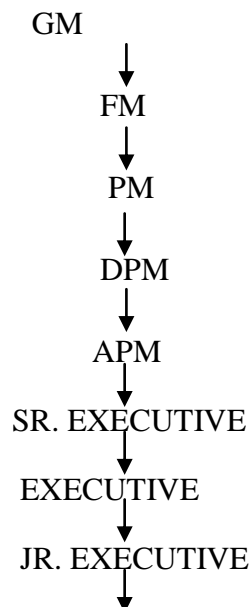
DGM Marketing & Merchandising

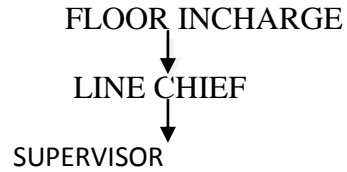
Balaram Roy Chowdhury

1.4.11 Product growth



1.5 Organo Gram Charts Metro Garments





1.6 Products

➤ Knit Products:

- * Jersey : In 100% Combed Cotton, CVC, CVS/TC, and Lycra mix
- * Polo Pique : In 100% Combed Cotton, CVC and CVS/TC
- * Back Pique : In 100% Combed Cotton, CVC and CVS/TC
- * Herringbone : In 100% Combed Cotton and CVS/TC
- * Popcorn : In 100% Combed Cotton and CVS/TC
- * Bubble Knit : In 100% Combed Cotton, CVC and CVS/TC
- * Crepe : In 100% Combed Cotton and CVS/TC
- * Engineering Stripe : In 100% Combed Cotton and CVS/TC
- * Feeder Stripe : In 100% Combed Cotton and CVS/TC
- * Auto Stripe : In 100% Combed Cotton and CVS/TC
- * Rib : In 100% Combed Cotton and CVS/TC
- * Jacquard : In 100% Combed Cotton and CVS/TC

➤ Name of Products:

- T- Shirt
- Polo- Shirt
- Jacket
- Kids Item
- Tang top
- Ladies top
- Dress

1.7 Buyers Name:



H & M



UNIQLO(GU)



LERROS



C & A



OSTIN



CALZEDONIA



VERNER

1.8 LIST OF MACHINERIES: METRO & BEA -CON

KNITTING & NARROW FABRIC MACHINERIES LIST					
SL	DESCRIPTION	BRAND	ORIGIN	QTY	UNIT
01	SINGLE JERSEY	PAILUNG, JUINN LUNG, LISKY	TAIWAN	33	SET
02	SINGLE JERSEY	MAYER& CIE	GERMANY	14	SET
03	RIB WITH LYCRA ATTACHMENT	PAILUNG	TAIWAN	04	SET
04	RIB / INTERLOCK WITH LYCRA	PAILUNG, JUINN LUNG	TAIWAN	16	SET
05	RIB WITH LYCRA ATTACHMENT	MAYER & CIE	GERMANY	02	SET
06	INTERLOCK	PAILUNG, JUINN LUNG	TAIWAN	05	SET
07	RIB / INTERLOCK	MAYER & CIE	GERMANY	02	SET
08	S/J & FLEECE MACHINE	PAILUNG, JUINN LUNG, LISKY	TAIWAN	37	SET
09	AUTO STRIPE	MAYER & CIE	GERMANY	04	SET
10	GREY FABRIC INSPECTION MACHINE	UZU	THILAND	08	SET
11	NARROW FABRIC MACHINE	YITAI, HAINING, GUENGZHON	CHINA	22	SET
12	FLAT KNIT RIB MACHINE	JY--LEH , MATSUYA	T AIWAN,JP	06	SET
			TOTAL	153	SET

DYEING & FINISHING MACHINERIES LIST					
SL	DESCRIPTION	BRAND	ORIGIN	QTY	UNIT
01	DYEING MACHINE: 25KG, 30KG, 200KG, 300KG, 400KG, 600KG	PMM	TURKEY	08	SET
02	DYEING MACHINE: 250KG, 750KG	THIES	GERMANY	02	SET
03	DYEING MACHINE: 500KG,700KG,1000KG, 1500KG, 20KG, 50KG, 750KG	SCLAVOS	GREECE	16	SET
04	DYEING MACHINE: 30KG, 60KG, 120KG, 800KG, 1120KG, 1200KG	FONGS	CHINA	13	SET
05	DYEING FINISHING MACHINE: SLITTER & OPEN WIDTH DE-WATER	CORINO	ITALY	02	SET
06	DYEING MACHINE: 1500KG, 500KG,500KG, 250KG	BRAZZOLI	ITALY	04	SET
07	FINISHING MACHINE: COMPACTOR (OPEN	TUBETEX	USA	01	SET
08	FINISHING MACHINE: COMPACTOR (OPEN)	LAFER	ITALY	03	SET
09	FINISHING MACHINE: DRYER (OPEN)	SANTEX	CHINA	01	SET
10	FABRIC INSPECTION MACHINE	UZU	THAILAND	03	SET
11	TUBULAR FINISHING MACHINE: DE-WATER	CALATOR	GERMANY	01	SET
12	TUBULAR FINISHING MACHINE: STEAM DRYER	ROUCHK	GERMANY	01	SET
13	TURNING MACHINE	DONGNAM	KOREA	05	SET
14	TUBULAR COMPACTOR	TUBETEX	USA	02	SET
15	TUBULAR SQUEEZER	CORINO	ITALY	01	SET

16	SOFT CALENDAR MACHINE: DNC-1400	DONG NAM	KOREA	02	SET
17	BRUSH MACHINE	LAFER	ITALY	02	SET
18	SINGING MACHINE	OSTHOFF	GERMANY	01	SET
19	DYEING FINISHING MACHINE: STENTER	BURCKNER	GERMANY	03	SET
20	SOFT SETTING MACHINE	DONG NAM	KOREA	01	SET
21	SLITTING MACHINE	BIANCO	ITALY	02	SET
22	SUEDING MACHINE	LAFER	ITALY	01	SET
23	SHEARING MACHINE	ICON	TAIWAN	01	SET

WASHING PLANTS MACHINERIES LIST					
SL	DESCRIPTION	BRAND	ORIGIN	QTY	UNIT
01	WASHING MACHINE: NS2211- CAPACITY 20 LBS	NGAISHING	HK	02	SET
02	WASHING MACHINE: NS2250- CAPACITY 500 LBS	NGAISHING	HK	03	SET
03	HYDRO EXTRACTOR : CAPACITY 200 LBS	NGAISHING	HK	04	SET
04	TUMBLE DRYER MACHINE : 300 LBS	NGAISHING	HK	06	SET
05	TUMBLE DRYER MACHINE :160 LBS	ABBATEX	TAIWAN	09	SET
06	CONVEYOR BELT CURING MACHINE	NGAISHING	CHINA	01	SET

			TOTAL	25	SET
--	--	--	--------------	-----------	------------

UTILITY MACHINERIES LIST					
SL	DESCRIPTION	BRAND	ORIGIN	QTY	UNIT
01	BOILER (5 TON, 10 TON)	COCHKRAN	UK	02	SET
02	DIESEL GENERATOR (100 KVA)	VOLVO	FRANCE	01	SET
03	GAS GENERATOR (900KW/1125KVA)	WAUKESHA	USA	03	SET
04	PRESSURE VESSEL	KSB	INDIA	05	SET
05	COMPRESSOR	BOGE	GERMANY	07	SET
06	WTP- CAPACITY 100 m3/Hr	CHEMPURE	INDIA	02	SET
07	WTP- CAPACITY 85 m3/Hr	ION EXCHANGE	INDIA	01	SET
08	ETP- CAPACITY 200 m3/Hr	CHEMPURE	INDIA	01	SET
09	EXHAUST GAS BOILER (2.5 TON)	THERMEX	INDIA	01	SET
10			TOTAL	23	SET

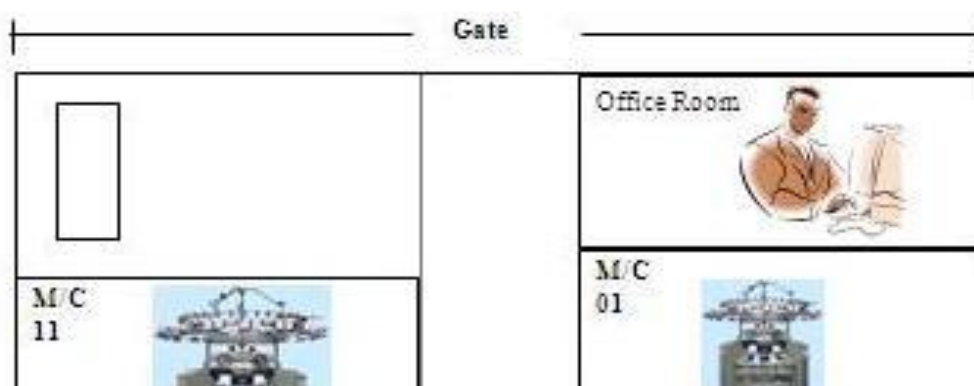
GARMENTS MAHCINERIES LIST

SL	MACHINE NAME	DESCRIPTION	BRAND	QTY
01	PLAIN M/C	SINGLE NEEDLE	JUKI, BROTHER	320
02	OVERLOCK	4THREAD, 6THREAD	PEGASUS, JUKI, YAMATO	374
03	CYLINDER BED	5THREAD	PEGASUS, YAMATO, JUKI	132
04	SMALL CYLINDER	5THREAD	PEGASUS	31
05	EXTRA SMALL CYLINDER	5THREAD	PEGASUS	03
06	FLAT BED	5THREAD	PEGASUS	39
07	BODYHEM COMPRESSOR	5THREAD	PEGASUS, YAMATO	29
08	FEED OF THE ARM	CHAIN STITCH	BROTHER, JUKI	11
09	HOLE STITCH	LOCK STITCH	BROTHER, JUKI	08
10	BUTTON STITCH	LOCK STITCH	JUKI	12
11	BARTACK	LOCK STITCH	BROTHER	09
12	ZIGZAG	LOCK STITCH	BROTHER	05
13	PICOT	CHAIN STITCH	KANSAI SPECIAL	07
14	COCOT/SCALLOP	CHAIN + INTERLOCK STITCH	KANSAI SPECIAL	04
15	PMD ELASTIC ATTACHING	CHAIN STITCH / MULTI PURPOSE	KANSAI SPECIAL	08
16	SMOCK	33NDL CHAIN STITCH	KANSAI SPECIAL	06
17	CHAIN STITCH M/C	SINGLE NEEDLE	JUKI	23
18	PANTI FD 4 NEEDLE M/C	PANTI FD	JUKI	17
19	ANGULAR STITCH M/C	5 THREAD	PEGASUS	02
20	RIB CUTTER M/C	LINING STRAPPING CUTTING M/C	LUNA, CHENG FENG, SM	15
21	SNAP BUTTON	SNAP BUTTON	PRYM	17

	ATTACH M/C			
22	LABEL CUTTER & FOLDER	LABEL CUTTER	UZU, CUTEX	09
23	FUSING M/C	ATTACH INTER LINING	HASHIMA	02
24	THREAD RE-CONING	2&4 CONES RECON AT A TIME	UZU, HASHIMA	03
25	P.P BELT	BIND FINISHED CARTON	UZU, TOYO	01
26	THREAD SUCKER/TRIMMER	SUCK & CLEAN WAIST THREAD.	UZU, OSHIMA, TOYO	05
27	NEEDLE DETECTOR	FIND OUT BROKEN NEEDLE	LOCK, HASHIMA	04
28	SPOT CLEANER	REMOVE SPOT	LEEWAI, NISSIN	10
29	IRON TABLE WITH IRON	IRONING	NAOMOTO, NISHO, VEIT	85
30	BUTTON TEST M/C	BUTTON PUSH/PULL TEST M/C	SAFQ	01
31	STEAM BOILER		NAMOTO	01
32	WASH & DRYER	SAMPLE BODY WASH TEST		02
33	AUTO FEED CUTTING M/C	SINGLE PLY FABRIC CUTTING M/C	PLOTTER TECHNOLOGY	01
34	CUTTING MACHINE	CUTTING MACHINE	KM	20
35	BAND KNIFE	BAND KNIFE	KM	01
36	FLAT SEAMER	4 NDL FEED OF THE ARM	YAMATO	17
37	BAS-PATTERN TAKER	SEWING DESIGN M/C	BROTHER	04
38	ROW EDGE	VERTICAL SIDE CUTTER	KINGTEX	10
			TOTAL	1248

Description of the Attachment

2.1.1 Knitting Machine layout at Metro Textile:



2.1.2 Machine Description of Metro knitting and dyeing mills:

Name	Origin	Needles	Type	Type	M/C dia	Gauge	Feeder
1.	FUKUHARA	Japan	1355T	Rib	18"	24G	60F
2.	FUKUHARA	Japan	1508T	Rib	20"	24G	60F
3.	ORIZIO	Italy	1656T	S/J	22"	24G	66F
4.	ORIZIO	Italy	1800T	S/J	24"	24G	72F
5.	ORIZIO	Italy	1886T	S/J	25"	24G	75F
6.	ORIZIO	Italy	1920T	S/J	26"	24G	78F
7.	JUINN LONG	Taiwan	2712T	S/J	36"	24G	108F
8.	JUINN LONG	Taiwan	2400T	S/J	32"	24G	96F
9.	JUINN LONG	Taiwan	1740T	S/J	23"	24G	69F
10.	JUINN LONG	Taiwan	1740T	S/J	23"	24G	69F
11.	JUINN LONG	Taiwan	1584T	S/J	21□"	24G	63F

2.1.3 Main parts of a circular knitting machine:

➤ Needle:

There are three types of needle-

- a. Bearded needle
- b. Compound needle
- c. Latch needle-
 - One butt needle.
 - Two butt needle.
 - Three butt needle.
 - Four butt needle.

➤ Cam:

Cam is called the specific path of the needles to produce a specific type of fabric.

There are three types of cam used in circular knitting machine:

- a. Knit Cam.
- b. Tuck Cam.
- c. Miss Cam.

a. Knit Cam:

It moves the needle upward enough to clear the old loop and receive the new yarn

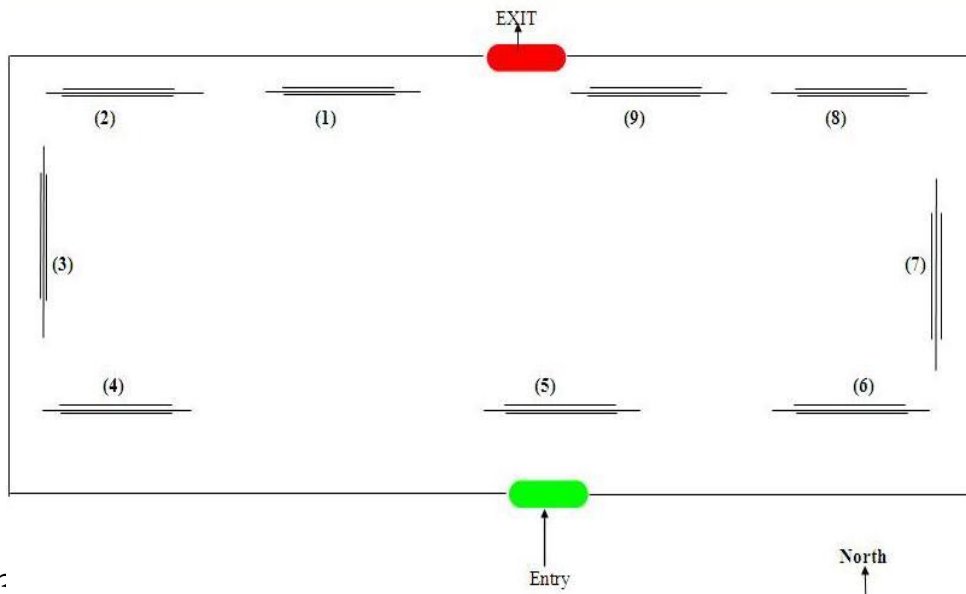
b. Tuck Cam:

It moves the needle upward not enough to clear. The old loop but receive the new yarn.

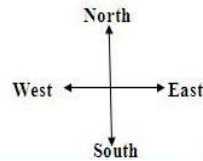
c. Miss cam:

It does not move the needle upward. The needles neither clear the old loop nor receive the new yarn.

2.1.4 Layout of Flat bed knitting Machine in Matro Textile:



LAYOUT PLAN OF FLAT BED KNITTING M/C IN
KKIL



xtile:

M/C Brand: MATSUYA
M/C Model: 172 S/J
Gauge: 14
M/C No: 050934
BED: 68inch/173cm

M/C Brand: SHIMA AEIKI
M/C Model: SFF-152T
Gauge: 14
M/C No: 3989
BED: 60 inch/152cm

(2)
M/C Brand: MATSUY
M/C Model: 172 S/J
Gauge: 14
M/C No: 050935
BED: 68inch/173cm

(8)
M/C Brand: SHIMA AEIKI
M/C Brand: SFF-152T
M/C No: 3990
BED: 60inch/152cm

(3)

M/C Brand: MATSUYA

M/C Model: 172 S/J

Gauge: 14

M/C No: 050936

BED: 68inch/173cm

(4)

M/C Brand: MATSUYA

M/C Model: 172S/J

Gauge: 14

M/C No: 050937

BED: 68inch/173cm

(5)

M/C Brand: STEIGER

M/C Model: SZT+1 240

Gauge: 14

M/C No: 0144Z

BED: 100inch/254cm

(6)

M/C Brand: STEIGER

M/C Model: SZT+1 240

Gauge: 14

M/C No: 0132Z

(9)

M/C Brand: SHIMA AEIKI

M/C Model: SFF-152T

Gauge: 14

M/C No: 3991

BED: 60inch/152cm

2.1.5 Some Sample of fabrics are as follows

:

Name of fabric	Sample of fabric
Single Jersey(cotton)	
Lycra Single Jersey	
Rib 1/1	
Rib 2/1	
Interlock	
Normal fleece	
Single jersey lacost	
Single jersey atripe	

Terry	
-------	--

2.1.6 Production calculation:

a. Production/shift in kg at 100% efficiency

$$= \frac{RPM \times \text{No. of Feeder} \times \text{No. of Needle} \times SL(mm) \times 60 \times 12}{10 \times 2.54 \times 36 \times 840 \times 2.2046 \times \text{Yarn count}}$$

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

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

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

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

2.1.7 This inspection is pointed by 4 point system

4- Point System		Acceptance Calculation
0-3	1	< 20 =A grade fabric
>3-6	2	20-30= B grade fabric
>6-9	3	30< = unacceptable fabric
>9	4	
Hole<1	2	
Hole>1	4	

Total fault x 36 x 100

Total Point = _____

Roll Length (yds) x Actual Width

2.2.1 Description of the main parts is as follows –

a. Main tank:

Main tank is the largest part of the dyeing machine. It is the main dye bath which contains the dye liquor and the fabric. The size of the tank depends on the capacity of the machine. Liquor & fabric circulates in the main tank during dyeing process. There may have one or multiple numbers of nozzles connected to the main tank according to the machine capacity.

b. Reserve tank:

This tank is mainly used for storage of hot water that is used in different stages of processing. The temperature of water in this tank is maximum 80C. Actually this tank saves the production time due to storage of hot water.

c. Additional/Mixing tank:

Additional tank is used for-

- Color dosing
- Soda dosing
- Salt dosing
- Chemical dosing
- Auxiliaries injection



Dosing tank

d. Circulation pump:

It is one of the most essential parts of the dyeing machine. It is used for circulation of dye bath liquor causing a flow from main tank to heat exchanger through filter net.

e. Nozzle:

Nozzle is the cylindrical pipeline inside the machine located at top position, through which the fabric is moved continuously by reel. It contains the spraying portion of the circulated liquor. The diameter of the nozzle may vary depending on the GSM of fabric.

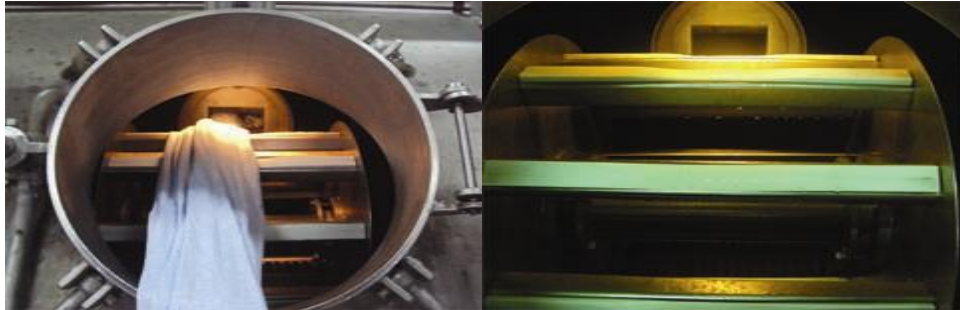


Fig: Nozzle and Reel

f. Valve:

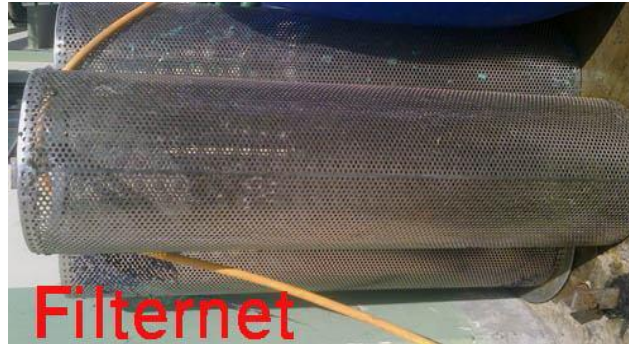
Valve is a small part of the dyeing machine. The closing or opening of the valve indicates the bath fill, bath drain, and steam in, steam out, dosing and inject operation during the process.



g. Filter net:

During the treatment of fabric in the machine bath, lots of loose fibers are produced from the fabric. To eliminate these loose fibers, filter net is used prior to main/circulation pump. If these

loose fibers are not eliminated, then liquor pumping may hamper and entanglement of fabric can be occurred as well.



2.2.1 Batch Preparation:

Batch preparation can be defined as a process where the visually Inspected greige fabric are divided into different batches. It is a part of dyeing process & it is done to feed the dyeing machines for fabric dyeing. It is very important to make a batch with maintaining a correct length of each nozzle.

2.2.3 Objective of Batching:

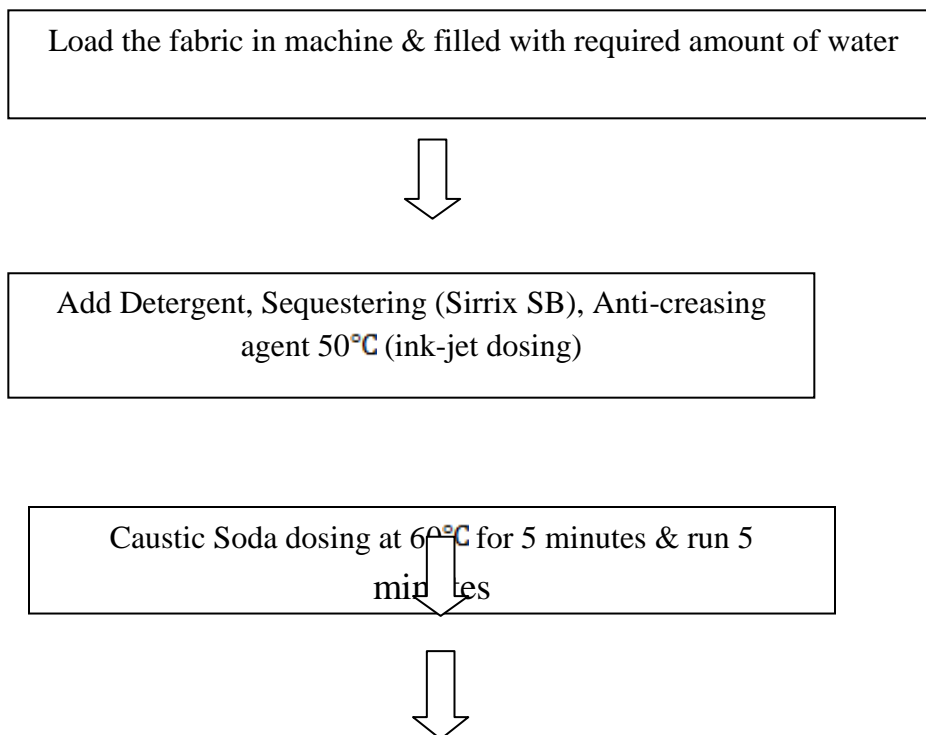
- To receive the grey fabric roll from knitting section or other source.
- Turn the grey fabric if require.
- To prepare the batch of fabric for dyeing according to the following criteria
- Order sheet (Received from buyer).
- Dyeing shade (color or white, light or dark).
- Machine capacity.
- Machine 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.

2.2.4PH range at different stages of production:

During production process pH is checked in the following stages where before checking the leveling pH the presence of Per-oxide in the bath is checked also.

1. Scouring and bleaching process pH: 10.5-11.5
2. Enzyme process pH: 4.5-5.0
3. Before dyeing (Leveling pH):6.5
4. Salt process pH: 7-8
5. Reactive dyeing pH: 10.5-11.5
6. Disperse dyeing pH: 4.5-5.0
7. Softener pH: 4.5-5

2.2.5Flow chart of Pre-treatment (Scouring/Bleaching) process of cotton:



H_2O_2 Dosing at 70°C for 5 minutes & run 5 minutes



Run 30 minutes at 98°C & then shade check (time may vary)



Cooling at 80°C & Drain



Normal Hot 80°C × 10 minutes



Acetic Acid & H_2O_2 killer is added at 55°C



Rinse 10 minutes



After 10 min check pH (4-4.5) & add Enzyme & run 60 minutes

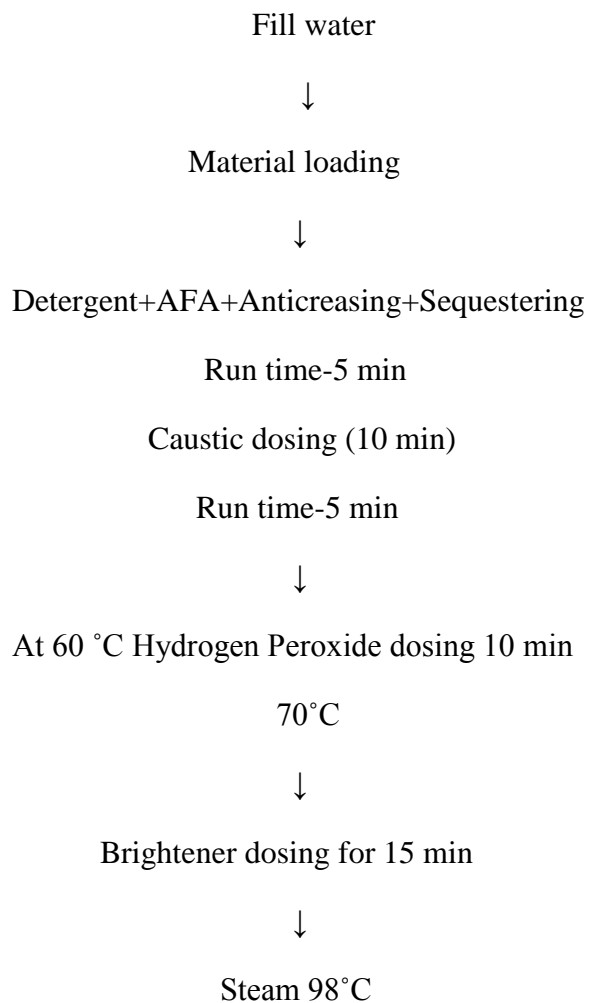


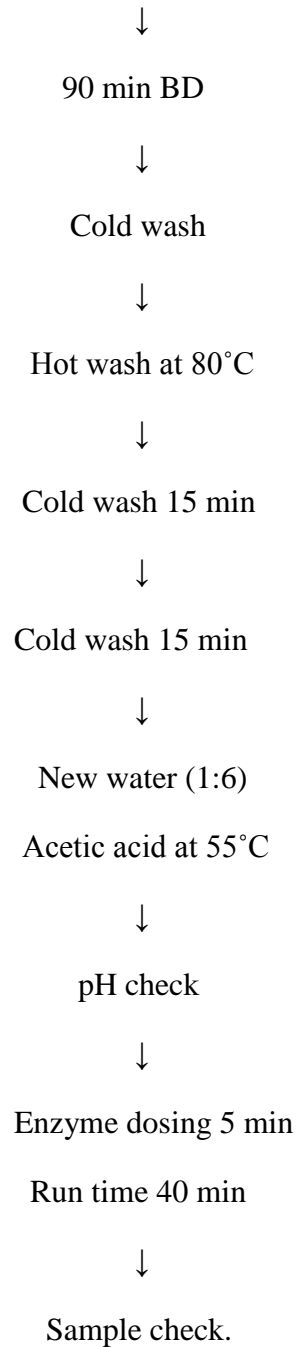
Rise temperature up to 80°C & run 10 minutes & shade check



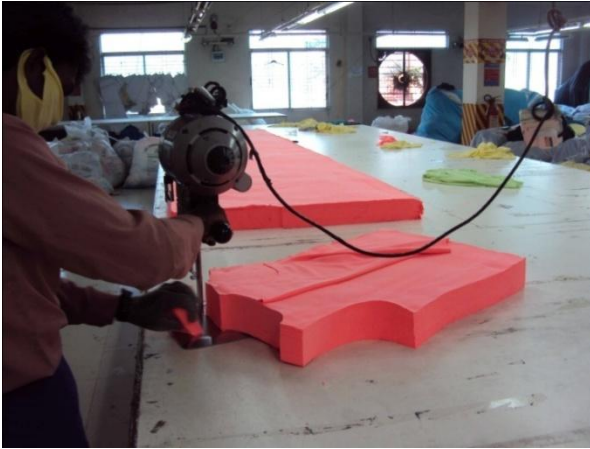
Drain & Rinse 10 minutes

2.2.6 Whitening Process:





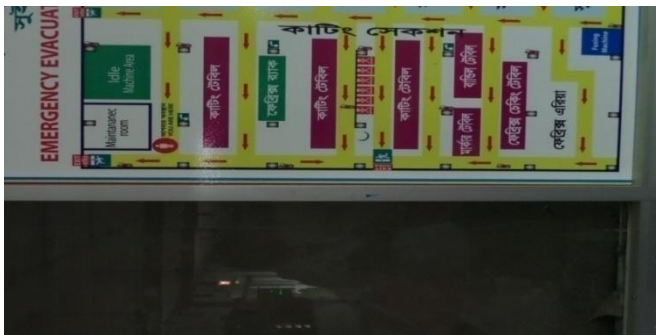
2.3.1 Metro Garments Cutting Section:



The main role of a cutting department is to cut garment components from fabric rolls or fabric than as per style specifications. And send cut components to sewing department in bundles. A cutting department of a garment manufacturing unit includes following sub-processes

- Fabric relaxation
- Fabric spreading / layering on cutting table
- Marker making
- Cutting - manual cutting (using scissors), machine cutting, automatic cutting.
- Numbering of garment plies (parts)
- Shorting and Bundling
- Inspection of cut components
- Shorting of printed and embroidery panels
- Re-cutting of panels
- Fusing garment components

2.3.2 Layout of Metro cutting section:



2.3.3 Process sequence of cutting room

Fabric Marking



Fabric Spreading



Fabric Cutting



Cut components inspection



Numbering



100% checking & Parts replacing if needed.



Shorting & Bundling



Sewing/Assembling

- Fabric spreading:

Before fabric laying a thin paper as like as marker that is marker size and thin paper size is same, then thin paper attach with spreading table by gum tape then spread the fabric according to marker size.

- Fabric cutting:

Fabric lay is cutting by straight knife cutting machine then separated cutting part.

- Numbering:

In this stage sticker is attached with all part of cutting part for shade matching. The sticker number maintains cutting number, size number, serial number.

M/c used in cutting section:

1. Fabric cutting m/c

Brand: Mack

Model: KS-AU V

Origin: Japan

Volts: 220v

Number of m/c = 6



Fig: Fabric cutting m/c

2. Numbering m/c

Brand: BLITZ

Model: 2253

Origin: Italy

Number of m/c= 5



Fig: Numbering m/c

2.3.4 Metro Garments Sewing Section:



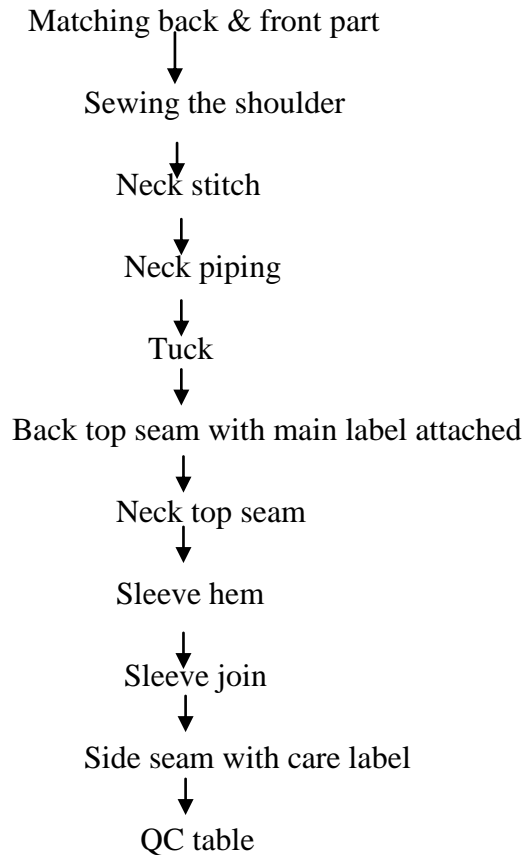
Sewing department is the heart of a manufacturing unit. Cut components are assembled in sewing department in assembly line. List of sub-processes those are done in sewing department includes.

- Making garment parts
- Sewing full garment
- Making garment accessories like dori, tabs, cords etc.
- Checking of stitched garments
- Alteration work of defective garments

2.3.5 Layout of sewing section:



2.3.6 Process sequence of sewing section (T-shirt):



2.3.7 Machine Name – Needle Type:

- Plain m/c - DB*1 (7-16 no. needle)
DP *5 (7-16 no. needle)
- Over lock m/c – DC*1 (7-14 no. needle)
- Flat lock m/c – UY*128 (9-16 no. needle)
- BT/hole m/c – DP*5 (7-16 no. needle)
- Button m/c –DP*17 (14 no. needle)
UY*128 (14 no needle)
Kansai m/c – UO*113 (11-18 no. needle)
DV*57 (14, 16 no needle)

All those are ORGAN type needle.

When the brand is A.EAGLE then use GROZ-BECKENT type needle.

2.3.8 Different types of sewing machines:

➤ Plain m/c

Brand: Sum Star

Model: ESLS1ASI-0413

Volt: 220

Origin: China

Number of m/c: 86



Fig: Plain m/c

➤ Flat Lock m/c

Brand: KANSAI

Model: LAK-10

Volt: 220

Origin: China

Number of m/c = 30



Fig: Flat Lock m/c

➤ Over Lock m/c

Brand: JUKAI

Model: 3600

Volt: 220

Origin: Japan

Number of m/c =80



Fig: Over Lock m/c

- Button Whole m/c
Brand: SIRUBA
Model: ESBTHMSI0038
Volt: 250
Origin: Japan
Number of m/c = 8



Fig: Button Whole m/c

- Button Attached m/c
Brand: JUKAI

Model: C5VTKSI0804

Volt: 250

Origin: Japan

Number of m/c =8



Fig: Button Attached m/c

2.3.9 Layout of Sewing m/c:

➤ Machine layout of T-SHIRT

Brand-Calvin Klein jeans

Input to output

Machine name-Division of works

- Over lock m/c-shoulder join
- Flat lock m/c-shoulder join top stitch
- Plain m/c-neck rip tuck (1/1 rib)
- Over lock m/c-neck join with body
- Plain m/c-back tap piping join
- Plain m/c-kun tuck
- Plain m/c-back tape top stitch
- Flat lock m/c-front neck top stitch
- Over lock m/c-sleeve joint
- Flat lock m/c-arm hole top stitch
- Over lock m/c-side seam
- Flat lock m/c-sleeve hem
- Flat lock m/c-body hem
- Inspection.

➤ Machine layout of T-SHIRT
BRAND-ZARA
Input to output
Machine name-Division of work

- Over lock m/c-shoulder join
- Over lock m/c-neck joint
- Over lock m/c-neck servicing
- Plain m/c-back neck tape
- Plain m/c-neck piping
- Plain m/c-kun tuck
- Plain m/c-label top seam
- Plain m/c-label attach with neck
- Over lock m/c-sleeve hem
- Over lock m/c-sleeve join
- Plain m/c-sleeve tuck
- Over lock m/c-side seam
- Plain m/c-loop tuck
- Plain m/c-chup tuck
- Over lock m/c-body hem
- Inspection

2.3.10 Metro Garments Finishing Section:



In Finishing department garments are nicely pressed and packed into poly bags. A finishing department has following sub-processes.

- Washing of garment (Some factories may have separate washing department)
- Buttoning and button holing
- Thread trimming
- Checking of washed / unwashed garments
- Stain removing
- Ironing or Pressing
- Final checking of garments after ironing
- Mending / repair work
- Tagging
- Folding and packing

2.3.11 Finishing Layout of Finishing Section:



- Sewing to finishing receive
- Inside quality check
- Suckering (suckering m/c)
- Ironing/pressing (water steam iron)
- After iron inspection
- Measurement (it determines length, width of fabric)
- Get up iron (it checks chest)
- Get up quality check (final quality check)
- Hours audit
- Style/color/size variation & segregation
- Shade variation
- Tag attachment (hang tag, care label)
- SKU check (it determines whether label is attached correctly or not)
- Folding
- Poly
- Assortment
- Packing
- Inspection

Machine Specification:

- M/C name: Iron Machine

Brand: Silver Star.

Model: BS-6 PC

Origin: China

M/C Number: 16



Fig: Iron Machine

➤ M/C name: Ironing table

Brand: OSHIMA

Model: IR-220

Origin: China.

M/C Number: 16



Fig: Ironing table

➤ M/C name: Thread Sucker

Brand: Nisho

Model: NH-TS5600A

Origin: China

M/C Number: 1



Fig: Thread Sucker

- M/C Name: Needle Detector Machine.
Brand: OSHIMA
Model: ON-688c
Origin: china
M/C number: 1



Fig: Needle Detector Machine.

- M/C Name: Cleaner Spray m/c
Brand: SILVER STAR
Model: SS-170
Number of m/c = 2



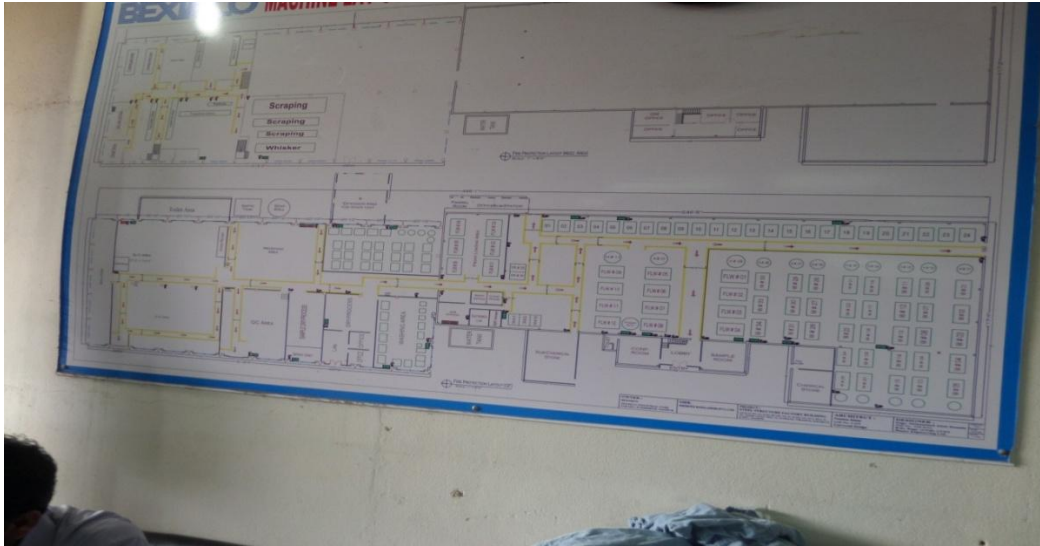
Fig: Cleaner Spray m/c

2.4.1 Garments Washing:



Garment washing is normally done after stitching. According to fashion trend and customer demand buyers ask for garment washing. For the washing apparel buyers mention exactly what types of washing they need for the order. For example, Tom Tailor buyer asked for washes like – Vintage wash, Cloud wash, softener wash or Acid wash. Each wash has different types of appearance on the fabric surfaces. Wash types mainly depends on the product types. For denim product heavy enzyme is required where for knitted Tee light softener wash may be okay.

2.4.2 Lay out of Washing Section:



Machine Specification:

➤ Sample Section

M/C Name: S Washing m/c

Brand: ASIAN STAN

Model: SX-30

Origin: China

Number of m/c: 16



M/C Name: Dryer m/c
Brand: ASIAN STAR
Model: PT-4
Origin: China
Number of m/c: 6



➤ Bulk Section:

M/C Name: Washing m/c
Brand: Tonello
Model: PATENTED 510
Origin: Italy
Number of m/c: 12



M/C Name: Dryer m/c
Brand: ASIAN STAR
Model: A1567
Origin: China
Number of m/c: 22



M/C Name: Hydro extractor

Brand: ASIAN STAR

Origin: Chin

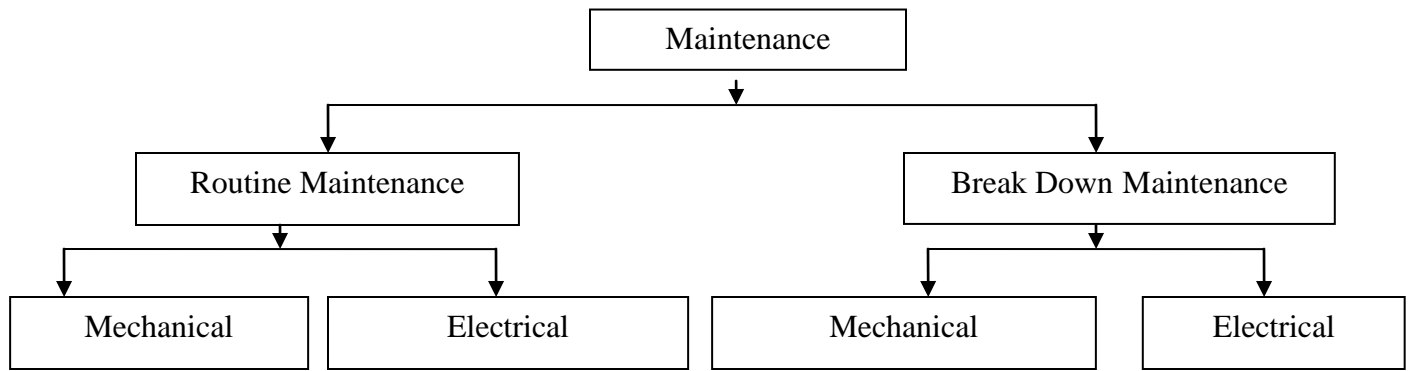
Number of m/c: 30



Maintenance

Maintenance is the process by which equipment is looked after in such a way that trouble free. Services and increased machine life can be ensured and specific Product quality required by the customer is sustained. Maintenance can increased machine life and ensured trouble free service

2.4.3Types of maintenance:



➤ Routine Maintenance:

After a particular little the machines are cleaned & reordered, that is routine or schedule maintenance. PPC does it once in a month. Schedule maintenance varies, time in time & also depends on situation according to types of machines, because maintenance is directly related to production.

Most of the time, all the screws, nuts, bolts & levers are checked, lubrication is also done. Workers inform about the problem areas of the machines. Depending on their information maintenance is done, Maintainers analyses the machine records & takes steps according to requirements.

➤ Break down Maintenance:

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

◆ Manpower Set-Up For Maintenance:

- A Shift 6AM - 2 PM
- B Shift 2 PM - 10 PM
- C Shift 10PM - 6AM
- General Shift 9AM - 6 PM
-

2.4.4 Maintenance tools/equipments & their functions:

Maintenance tools/equipments	Functions
1. Adjustable wrench	Used for setting nut & bolts
2. Pipe Spanner	For pipe fitting

3. Spanner	Fixed Spanner for nut & bolts fitting
4. Socket	Handle system for nut & bolt fitting
5. hammer	To apply load where required
6. Screw driver	To release any screw
7. Punch	Used to fit any worn out shaft
8. Lock	To open the clip of bearing
9. Hack saw	To cut any metallic thing
10. Outside	To measure outside dia
11. Inside	To measure inside dia
12. Slide calii	To measure very small dia
13. Vernier scale	To measure very small dia
14. Chain ton	To lift heavy load
15. Welding machine	To join metallic
16. Grinding machine	To make the smooth fabrics
17. Tester	To test electric circuit
18. Pliers	To grip anything & cut anything
19. Avometer/Voitmeter	To measure voltage

2.4.5 Evaluation of maintenance performance

- Ratio of cost of maintenance (to be measured from year to year) to capital investment.

$$\text{I.e. maintenance performance} = \frac{\text{maintenance cost per year}}{\text{capital investment}}$$

- Ratio of down time to the available hours

$$\text{I.e. maintenance performance} = \frac{\text{Downtime (hours)}}{\text{Available hours} \left(\text{working days} \times \frac{\text{hours}}{\text{days}} \times \text{no. of m/c} \right)}$$

- Frequency of breakdown:

The ratio between no. of break down to available machine hour.

$$\text{I.e Frequency of break down} = \frac{\text{No. of break down}}{\text{Available m/c hours}}$$

2.4.6 Store & Inventory control:

Inventory control is a planned approach of determining what to order, when to order and how much to order to stock so that costs associated with buying and storing are optimal without interrupting production and sales.

Inventory Control reduces costly inventory errors, improves customer service, and will increase the value of our business. Wasp's inventory software and inventory tracking systems are easy to use and implement without the cost or complexity of larger inventory tracking systems.

Inventory control is concerned with minimizing the total cost of inventory. In the U.K. the term often used is stock control. The three main factors in inventory control decision making process are:

- The cost of holding the stock (e.g., based on the interest rate).
- The cost of placing an order (e.g., for raw material stocks) or the set-up cost of production.
- The cost of shortage, i.e., what is lost if the stock is insufficient to meet all demand.

Layout of Store Section



Functions of inventory control:

- To develop policies, plans & standards to achieve inventory control objectives.
- To build up a logical & workable plan for doing the job satisfactory.
- To develop methods that will bring defined result economically.
- To provide necessary physical facilities.
- To maintain overall control by checking result & adopting corrective action.

Advantages of inventory control:

A well planned and properly administered system of inventory control will give the following benefits:

- Improvement of customer frictions.
- Improvement of labor and community relations.

- Increase in the effectiveness of key personnel's.
- Reduction in manufacturing cost.

Procedure for inventory control:

When the goods from the supplies arrive at the factory gate. This form is filled up by the man at the gate. This form is known as stores Receipt Voucher (S.R.V). Here mentions the goods received date. Suppliers name, together with information regarding rejected or returnable goods. Then the incoming materials go through the inspection the inspector will sign the S.R Voucher or the authorizes the store keeper to accept the goods. From the stores the S.R. Voucher will move to the accounts section which will in due course of time match it with the suppliers invoice before making any money payment.

Control of stores issue:

The material is issued from the stores against a particular numbers. On the basis of materials requisition note duly signed by the authorized person, usually it is raised in triplicate. One copy is retained in the authorized person's office, one in the store & in the third copy moves from the stores to the central stock control department. Where concerned persons will make necessary adjustment in their stock ledger & then to the costing department. Sometimes surplus material from the production departments are returned to stores under a note.

3. Impact of Internship

3.1. Knitting:

- I have acquainted with the Layout of Knitting Section.
- I have learned about different types of knitting machine.
- I have acquainted with the work culture of Knitting Section.
- We have observed how to operate loop, sinker, needle, cylinders, and cam in knitting machine.
- I have learned about tray design in knitting machine.
- I have learned about the process of evaluating grey fabric.

3.2. Dyeing:

- I have acquainted with the main parts of dyeing machine such as main tank, reserve tank, mixing tank, circulation pump and nozzle etc.
- I have observed about Batch preparation, PH range and different stage of production.
- I have learned about flow chart of pre-treatment scouring and bleaching process of cotton.
- I have acquainted with the name of dyeing machine such as this machine.
- I have acquainted with the Standard machine which increase or decrease GSM

3.3. Garments Cutting Section:

- I have acquainted with the Layout of Cutting Section.
- I have learned about different types of marker.
- I have acquainted with the Fabric Spreading.
- I have learned about how to operate Cutting and numbering machine.
- I have learned with the Sewing thread consumption.

3.4. Garments Sewing Section:

- I have acquainted with the Layout of Sewing Section.
- I have learned about different types of sewing machine.
- I have acquainted with the Layout of sewing machine (T- Shirt).
- I have learned about sewing fault.
- I have acquainted with the Final Garments Checking.

3.5. Garments Finishing Section:

- I have acquainted with the Layout of Finishing Section.
- I have learned about Cartoon Consumption.
- I have acquainted with the Hanging.
- I have acquainted with the s m v calculation.
- I have learned about Fabric alter.

3.6. Garments Washing Section:

- I have acquainted of Layout of Finishing Section.
- I have learned about the garments hand feel and improve bulkiness.
- I have acquainted of washes such as acid wash, enzyme wash, stone wash etc.
- I have learned about pp spray and pp sponging.
- I have acquainted of scraping area.

3.7. Maintenance:

- I have acquainted of factory plants, equipments, machine tools.
- I have learned about production cycle within the stipulated range.
- I have acquainted of Manpower Set-Up for Maintenance.
- I have observed about Maintenance tools/equipments & their functions.
- I have learned about Evaluation of maintenance performance.

3.8. Store:

- I have acquainted Layout of Store Section.
- I have learned of minimize losses from price declines.
- I have acquainted with Functions of inventory control

- I have observed of Procedure for inventory control
- I have learned about Control of stores issue

4. Conclusion

4. Conclusion:

I am enough fortunate that I have got an opportunity of having a training in this factory. I have got co-operation and association from the authority fully. All the machines and materials found on appreciable working condition. All the stuffs and officers were very much helpful. I apologize for my any behavior which may disappoint the officers and personnel.

Due to secrecy act, all the data on costing and marketing activities has not been supplied and hence the data has given regarding to this done not resemblance to the actual data. The whole process is not possible to bind in such a small frame. Hence I have spent my effort on summarizing, not on describing.