



Daffodil
International
University

**Faculty of Engineering
Department of Textile Engineering**

A Report on

“Industrial Attachment” at Fakir Fashion Limited FFL.

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Declaration

We, Md. Khairul islam, ID- 151-23-4140, Md. G.M Thowker Hassan, ID-151-23-4164, hereby declare that the work entitled ‘investigation on the failed final inspection report to find out the root causes of defects and their remedies’ is our original work. We have not copied from any other students’ work or from any other sources except where due reference or acknowledgement is made explicitly in the text, nor has any part been written for us by another person. We also declare that neither this report nor any part of this thesis report has been submitted elsewhere for award of any degree.

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Now we would like thank our friends whose contention help to find out each solution.

Finally we express our sincere gratitude to our father mother brother sister for their continuous support, ideas and love during our studies.

Executive Summery

Textile and garments sector is the fastest growing sector in Bangladesh. It is 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 this Industrial training minimizes the gap between theoretical and practical knowledge and make us accustomed to industrial environment. I got an opportunity to complete two-months long industrial training at **FAKIR FASHION LIMITED**, which is a 100% export-oriented composite Knit Garments Industry. It has well planned & equipped fabric dyeing-finishing and garments units in addition to facilitate knitting and knitwear manufacturing.

By means of practical knowledge it's possible to apply the theoretical knowledge in the practical field. For any technical education, practical experience is almost equal important in association with the theoretical knowledge.

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

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CHAPTER 1

INTRODUCTION

Company Profile

Company name	Fakir Fashion Ltd (FFL)
Type of business	Manufacturer and exporter
Year of establishment	2009
Contact person	Fakir Kamruzzaman Nahid (C.I.P)
	Managing Director
	nahid@fakirfashion.com
Total man power	9623
Knitting	18 tons per day
Dyeing	25 tons per day
Washing	40,000pcs/day
Garment	150,000 pcs (Basic T-shirt)
Embroidery & Printing	115,000 pcs
Products	Shirts & Polo Shirts, Pajama sets, Ladies & Girls dresses, Night wears, Boxer, Fleece jackets, knit & infant wears. (We are specialized on organic and blended cotton products)
Head office & factory	Dohargaon, PO. Baliapara, P. Rupgonj, Dist. Narayan gonj
	+8809666778888 (IP phone)
	Email. info@fakirfashion.com
	Web: www.fakirfashion.com
Area of Premises	2000000 sqft



Map position of Fakir Fashion Ltd.



History

‘Fakir’
the title
came
from the
owner’s
family

title, founder of the group was **Late Mr. Yusuf Ali Fakir** who started his business in the mid of nineteenth century as local textile manufacturer, rather than this the founder also had Jute Trading, Dyes & Chemical Trading company, later on from 1970 with the involvement of founder’s five sons, the company gradually developed and started exporting garment in 1988. Fakir Group started garment export with 4 sewing line and now we have 300 sewing lines along with all require facilities. Fakir Group is now a fully compliance composite knit garment manufacturing industrial group. The Groups



yearly turnover as of 2013 was \$300 million and Fakir Fashion's turnover was \$50 million.

Like the beginning of the most successful business stories, the birth of Fakir Fashion Limited started with a dream in 2009 the founder chairman dreamt of creating a world class garment company which would be grounded on a principal of excellence. Since then the company has flourished to become a name of recognized and respected not only for the superior quality of the products, but also for its strong values. The ability to learn continuously has given us the flexibility and the nimbleness that is required for the growth in changing and challenging time. The company today boasts of and ever growing international clients base for its entire range of products. A critical pillar in supporting an organization is the team which forms its core. The company has always believed in nurturing and retaining top talent. The employees are encouraged to participate actively in decision making in turn ensures continues learning.

In the flow of gradual development, Fakir Group has introduced its new complained composite knit garment unit named "**Fakir Fashion Limited**". They developed Fakir Fashion with 3rd generation facilities, for instance vertical sewing lines, Hi-Tech machineries, ERP software for HR, Accounts & Production and integrated with FAST REACT UK based production planning & monitoring software, Wi-Fi facility, Instant Sampling (Inside Factory), Independent R&D section etc.

Mission & Vision of Fakir Fashion Limited

Mission

Fakir Fashion Limited mission is to earn customer loyalty by investing in people and system there by providing them with completely priced eco-friend garments of premier.

Vision

Fakir fashion Limited's vision is to be a leader in the global market by increasing customer base and by offering valuable service through prompt quality product.

Objectives of Fakir Fashion Limited

- (i) **Fakir Fashion Limited** goal is to achieve zero tolerance in production by upgrading total quality management and proper production management.
- (ii) Create a favorable image of world as a high quality garments manufacturer and supplier.

- (iii) Train and develop a motivated and skilled workforce considering the “Quality of Life” for the employees.
- (iv) To meet the appropriate expectation of clients.
- (v) Provide Maximum Satisfaction to our valued customers.
- (vi) Latest design and talents at our work force.

Code of ethics of Fakir Fashion Limited

- (i) Manufacturing and supply products and service of the highest quality and optimum value.
- (ii) Sustain a level of competence expected as a professional operator and only supply such products and service for which Fakir Fashion Limited is suitably qualified.
- (iii) Conduct all aspects of business in a professional and responsible manner.
- (iv) Engage in fair and open competition based on truthful representation of products and service offered.
- (v) Customer Satisfaction: Satisfy Customer with highest quality product, service & support.
- (vi) Excellence: Achieve excellence in people, creativity & imagination.
- (vii) Innovation: To innovate new method to provide customer qualified products.
- (viii) Efficient: To be efficient in producing product

Buyers:

1. H & M
2. COS
3. C & A
4. TOM TAILOR
5. ZARA
6. IDITEX
7. GUESS
8. SUPREMA
9. MANGO
10. GINA TRICOT
11. C & A
12. ESPRIT

Management Personnel:

1. Fakir Bodruzzaman, Chairman, Fakir Fashion Ltd
2. Fakir Kamruzzaman Nahid (C.I.P), Managing Director, Fakir Fashion Ltd
3. Fakir Wahiduzzaman Riyeed, Deputy Managing Director, Fakir Fashion Ltd

Various Department of Fakir Fashion Limited:

If the jobs are not organized considering their interrelation and are not allocated in a particular department it would be very difficult to control the system effectively. If the departments are not tailored for the specific works there would be chaotic condition and the performance of a certain department would not be measured. Fakir Fashion Limited has done this work very well. Different department of Fakir Fashion Limited are as follows:

1. Accounts Department

Accounts department deals with day to day book keeping, daily collections, salaries of all employees, etc. Accounts department of Fakir Fashion Limited has some responsibilities which are given below:

- (i) Finalization of monthly accounts as well as yearly financial statement of the group for the management, banks, financial institutions.
- (ii) Prepare quarterly, half yearly, yearly financial information including financial statement.
- (iii) Monitoring the records of daily all financial transactions in the book of original entry.
- (iv) Check and sign all the vouchers before payment.
- (v) Debtors Management and Credit control.
- (vi) Accounting standard and their implementation.
- (vii) Store/Materials accounting of the group.
- (viii) Reconciliation of Fakir Fashion Limited Bank Ledger with Bank statement.
- (ix) Bank and Financial liability reconciliation, Bank interest calculation and provision.

Other main function of account department is tax payments. They deal with the central sales TAX, VAT, excise and other department. Monthly returns are prepared by the accounts department.

2. Finance Department

Finance department manages the fund available for the operations of the business, by making a balance between the fund inflow and fund outflow. The management of all activities related to finance requires considerable expertise and specified knowledge of banks, financial institutions, the different sources of finance and ways to profitability utilize these funds. Finance department of Fakir Fashion Limited has some responsibilities which are below:

- (i) Preparation of project to arranging new project finance as well as new expansions and monitoring the new project financing.
- (ii) Prepare financial forecasts on a regular basis.
- (iii) Up-date and organize the intercompany financial transaction.
- (iv) Develop financial strategies, financial planning and management budget and budgetary control policies and procedures.
- (v) Margin analysis.
- (vi) Costing and profitability analysis.
- (vii) Management reporting.
- (viii) Procurement of foreign exchange loan under different line of credit.
- (ix) Developing different financial process.

3. Quality Control Department

The quality control department of Fakir Fashion Limited is always trying to control the expected quality provided the buyer. The quality controlling process is done by a specialized quality controller. The process of quality control are as follows:

A. Quality Control in Sample Section

- (i) Maintaining buyer Specification standard
- (ii) Checking the sample and its different issues
- (iii) Measurements checking
- (iv) Fabric color, GSM, Fastness etc. properties required checking
- (v) SPI and other parameter checking

B. Quality Control in Marker Making

- (i) To check notch or drill mark
- (ii) Fabrics width must be higher than marker width
- (iii) Fabrics length must be higher than marker length
- (iv) Matching of green line
- (v) Check pattern size and dimension
- (vi) Matching of check and stripe taking into consideration
- (vii) Considering garments production plan
- (viii) Cutting table length consideration
- (ix) Pattern direction consideration

C. Quality Control in Fabric Spreading

- (i) Fabric spreading accounting to correct alignment with marker length and width
- (ii) Maintain requirement of spreading
- (iii) Matching of check and stripe
- (iv) Lay contains correct number of fabric ply
- (v) Correct ply direction
- (vi) To control the fabric splicing
- (vii) Tension control

D. Quality Control in Fabric Cutting

- (i) The dimension of the pattern and the cut piece should be same and accurate
- (ii) Cut edge should be smooth and clean
- (iii) Notch should be cut finely
- (iv) Drill hole should made at proper place
- (v) No yarn fraying should occur at cut edge
- (vi) Avoid blade deflection
- (vii) Maintain cutting angle
- (viii) More skill operator using

E. Quality Control in sewing Section

- (i) Input material checking
- (ii) Cut panel and accessories checking
- (iii) Machine is in well condition
- (iv) Thread count check
- (v) Special work like embroidery, printing panel check
- (vi) Needle size checking
- (vii) Stitching fault should be checked
- (viii) Garments measurement check
- (ix) Seam fault check
- (x) Size mistake check
- (xi) Mismatching matching of trimming
- (xii) Shade variation within the cloth
- (xiii) Wrong placement of interlining
- (xiv) Creased or wrinkle appearance control

F. Quality Control in Finishing Section

- (i) Proper inspection of the garments including measurement, spot, dirt, impurities
- (ii) Water spot
- (iii) Shading variation check
- (iv) Smooth and unfold in pocket
- (v) In secured or broken chain or button
- (vi) Wrong fold
- (vii) Proper shape in garments
- (viii) Properly shape in garments
- (ix) Properly dried in after pressing
- (x) Wanted wrinkly or fold in lining
- (xi) Get up check
- (xii) Collar closing
- (xiii) Side seam
- (xiv) Sleeve placket attach
- (xv) Cuff attach
- (xvi) Bottom hem
- (xvii) Back yoke
- (xviii) Every parts of a body

4. Production Department

Fakir Fashion has production department which is the key department of its. In this department production work is done according to the quality given by the buyer. In this department all the works are done under the authority of a supervisor. The supervisor's duty is to ensure that workers are doing their works appropriately and accurately, and inspecting that the work is done by maintaining quality.

5. Merchandising Department

Merchandising department of Fakir Fashion Limited is duty bound to take order from the buyers and providing the order to the factory and consult with the buyers and dealing all the shipment works. They are the key function of the company. Merchandising department is run by senior merchandiser. He always inspects the production unit and gives instruction to the production supervisor, and handles the buyer.

6. HR and Compliance Department

Fakir Fashion Limited has HR and Compliance department. HR department perform activities like planning. Selection of candidates, providing training, Identifying training needs Performance appraisal and other activities. Compliance department performs the following activities:

- (i) To floor visit at least thrice a day.
- (ii) To ensure workers fire safety, fire prevention, fire equipment, health & safety and comfortable environment at work place.
- (iii) To aware the workers about personal protective equipment.
- (iv) To receive grievance, complain, demand, & suggestion from the workers & after receiving the issue discuss with the related persons and local management immediately.
- (v) Try to find out emotional problem of an employee. The problem may be work related or personal or family which affects his/her work performance.
- (vi) To provide supportive counseling the sick worker for medicinal support on the worker's requests, complain or situational demand.
- (vii) Try to make aware the existing workers about by company provided all facilities & necessity of compliance.
- (viii) To check all production related register if any date mentioned of holiday or not.

SWOT Analysis of Fakir Fashion Limited

The main objective of any business institution is earning profit and to survive in the market with a better competitive position. Fakir Fashion Limited is not an exception. The main objective of this company is also earning profit.

It is known that, $\text{Profit} = \text{Revenue} - \text{Expense}$. With the changing business environment profit, revenue and expense also change. There are many factors which force to change the profit, revenue and expenses.

Strength of Fakir Fashion Limited:

There are many factors that help in increasing or decreasing the profit of the company. When the profit increases, it is treated as the strength of the company.

1. Own Dyeing Facility

The main strength of the Fakir Fashion Limited is that it has its own dyeing. The company can take facilities from dyeing for their product as well as Fakir dyeing gets order from the other factory.

2. Skilled Workforce

From its beginning Fakir Fashion Limited looks into the combination of effectiveness and efficiency regarding its objectives. As a result within a few days it got the higher regard from its buyers.

3. Market Reputation

Fakir Fashion Limited is one of the major factories in Bangladesh that's why they have reputation in local market and having trust from investors.

4. Collaboration with suppliers

To provide higher value in their value delivery process Fakir Fashion Limited has built the long-term relationship with some competent suppliers. The collaboration makes this organization honest to its commitment of quality and scheduled delivery to its buyers.

5. Permanent Buyers

For its reputation of committed organization it has built a marketing network with some prominent buyers. These buyers are not easily vulnerable to other factories; as they are satisfied with Fakir Fashion Limited for its efficiency and effectiveness.

6. Collaboration with backward linkage industry

To be ever successful in their commitment to their buyer they always assure the on time delivery of the accessories needed in the manufacturing process. Merchandizing dept. has taken the responsibility of supplying these accessories to the manufacturing process for its assured supply. For the convenience of this responsibility they have built long term relationship with the suppliers of accessories that they don't manufacture and done necessary paper work with strong term and condition with those accessory suppliers.

7. Long-term relationship with buyers

Fakir Fashion Limited honors the long-term relationship with their buyers. So the buyers remain loyal to the company. This is the reason long-term relationship with their buyer is strength of the company.

Weaknesses of the Fakir Fashion Limited:

There are many factors that help in increasing or decreasing the profit of the company. When the profit decreases, it is treated as the weakness of the company.

1. Fail to attract big Buyer

Despite effectiveness and efficiency one of the weaknesses of Fakir Fashion Limited is its short capacity. For its low level capacity Fakir Fashion Limited it's deprive from potential growth resulting from its present reputation, which could be achieved otherwise.

2. Lack of warehousing

There is no proper placing for final product to place them safely and at the time of their dispatch there is possibility of mistake.

3. Communication Gap

There are a little bit gaps in communication between the departments. May be these confirm each and every thing from each other but still they make mistakes and blame each other to safe them.

Opportunities of Fakir Fashion Limited:

There are many factors that help in increasing or decreasing the revenue and expense of the company. When the revenue increases and expense decrease, it is treated as the opportunity of the company.

1. Cheap Labor

The labor cost in Bangladesh is very cheap. So it is an opportunity Fakir Fashion Limited.

2. Motivating the employees

HR Department can prove and show them they are here for employees by motivating the employees performing their best. They can find the motivation level of their employees and give incentive to motivate them.

3. Advertising

Fakir Fashion Limited has the opportunity to advertise about their selves to promote their textile products. They can advertise in international magazines about their company Fakir Fashion Limited Can publish its own local business magazine to promote their selves can be advertised over the internet (electronic marketing).

4. Online Shopping Store

Fakir Fashion Limited can open its online store where they can show their garments variety and apparels. The advantage of this step would be:

- (i) Online marketing.
- (ii) Capturing the market over internet internationally.
- (iii) The material can be sold out at online shop.

5. Technology

The technology has been improved for the garments industry and these technologies are being acquired by the international competitors as well as by local competitors so they are producing good quality garments products and increasing the efficiency as well as decreasing the cost of production. Fakir Fashion Limited has the opportunity to invest for the new technology. By acquiring the latest technology, they can increase the production quality, efficiency and can decrease the cost of production.

Threats of Fakir Fashion Limited:

There are many factors which are harmful for the company and many cause potential minimizing of the revenue and maximizing the expenses of the company. These are known as the threats.

1. The bargaining power of the suppliers

In this industry as garment manufacturers are numerous and their forward integration systems are not strong for their illiteracy or inability to convince the foreign buyers. Therefore, the company enjoys little bargaining tendency of garment manufacturers.

2. The bargaining power of the customers

In our country Fakir Fashion Limited Industry faces a little bargain over the negotiation as a boon of quota system. As a result the bargaining power of this company is very little.

3. The threat of substitute products

In this industry this aspect is not considered because there is no perfect substitute for their provided service.

4. Local competitors

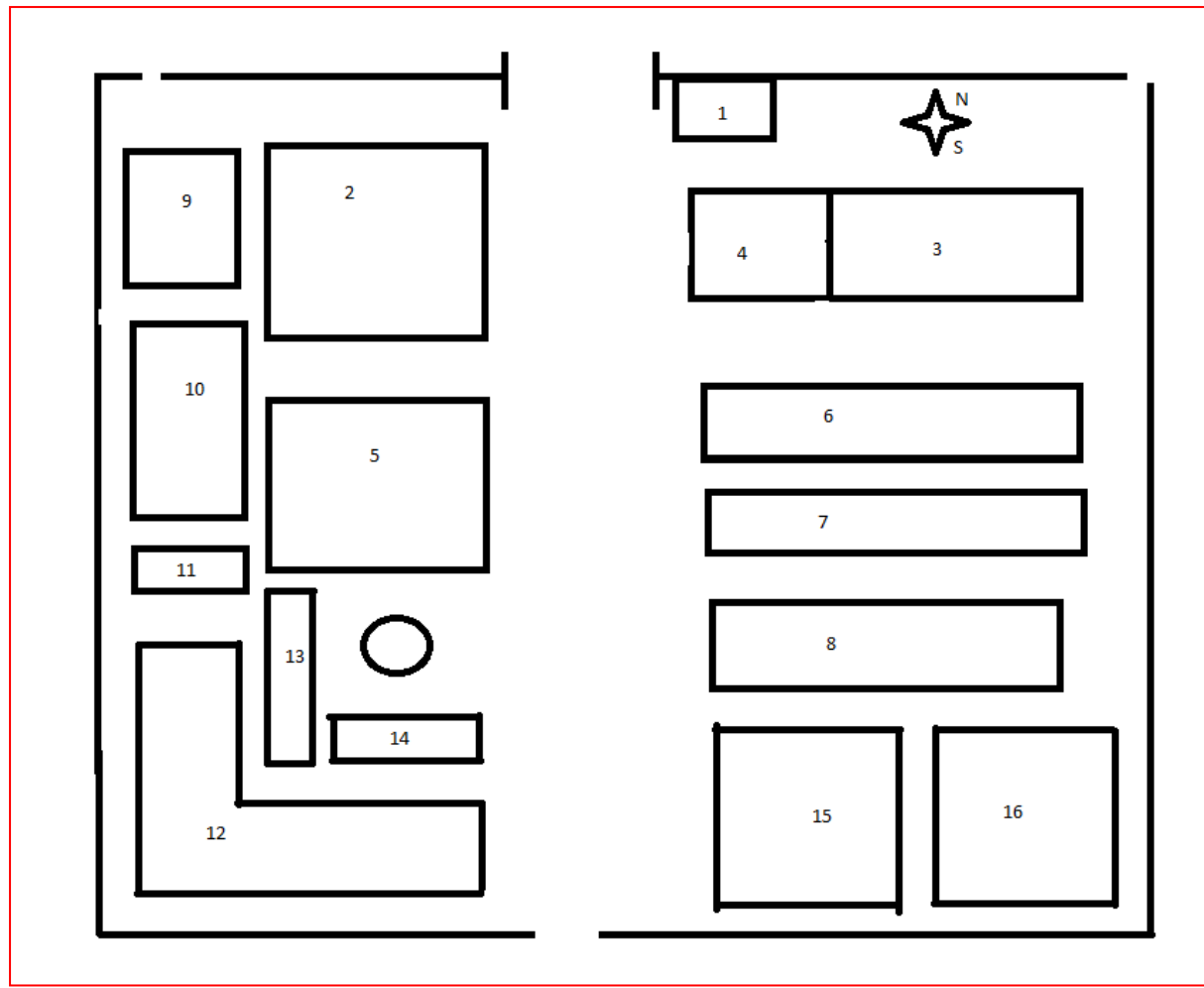
Bangladesh is a lucrative domain for foreign buyers of garment products. As a result the garment industry itself is very lucrative to the local entrepreneurs.

5. Political unrest

In our country political instability often hampers the effectiveness and efficiency of business organization. Thereby political unrest is a notable threat to smooth function of Fakir Fashion Limited.

All Departments of Fakir Fashion Ltd

1	Accounts	23	Maintenance
2	Admin	24	Management
3	Audit	25	Material GPQ
4	Business Automation	26	MCD
5	CAD	27	Medical
6	Civil	28	Merchandising
7	Commercial	29	Marketing
8	Compliance	30	Planning
9	Cutting	31	Printing
10	Design and Product Development	32	Process Improvement
11	Dyeing & Finishing	33	Production Audit
12	E.C.R. and E.T.P.	34	Quality Assurance
13	Embroidery	35	R.Q.S
14	Export	36	RMG
15	Finance	37	Sample
16	Finishing	38	Sewing
17	G.P.Q.	39	Supply Chain Management
18	HRD	40	Technical
19	IPE	41	Textile
20	IT	42	Textile Quality
21	Knitting	43	Washing Plant
22	Leftover		



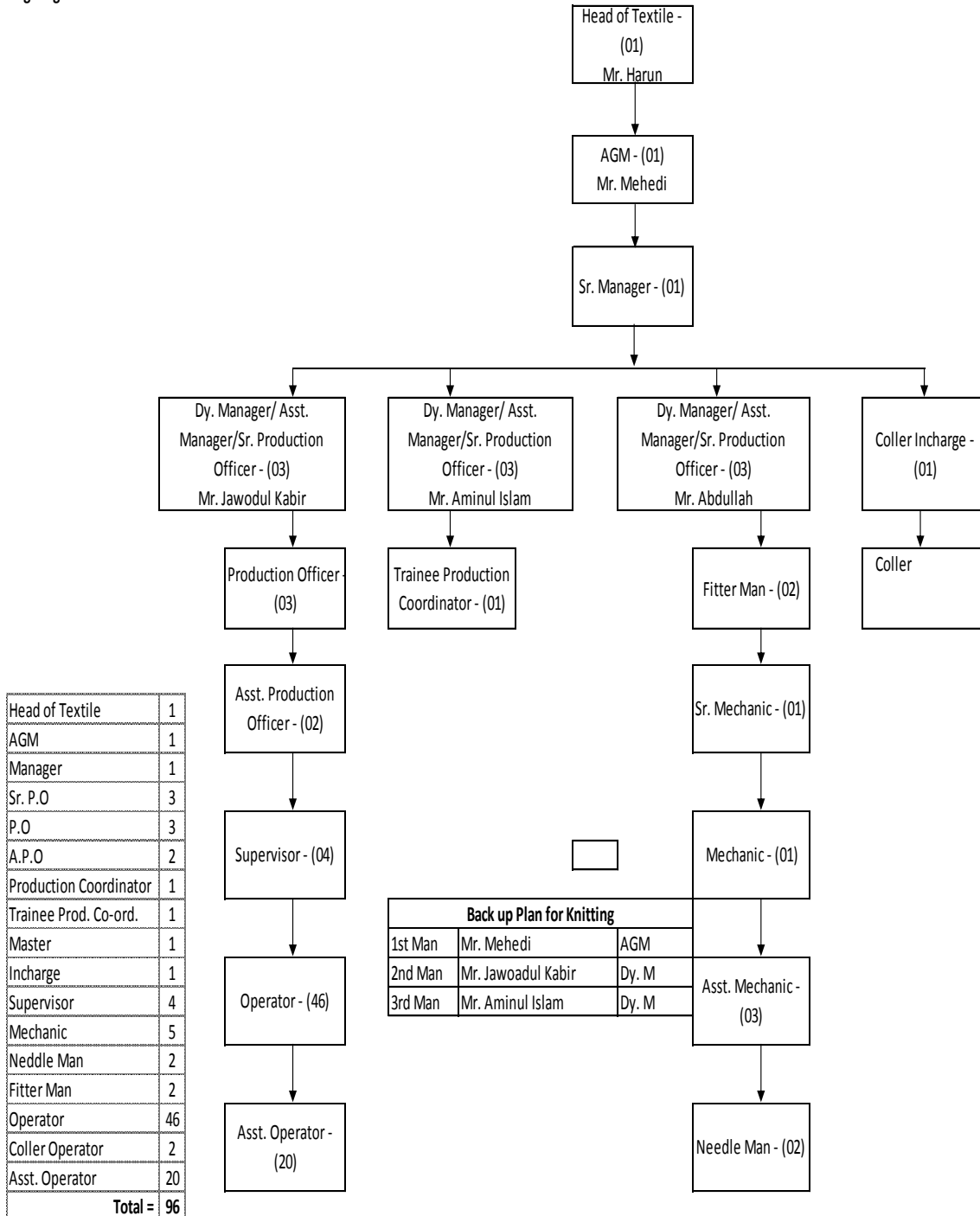
Building Layout

No	Name	NO	Name
1	Security office	9	Washing Plant
2	MD, Merchandizing, supply Chain Office & Garments section	10	Finish Product Storage
3	Human Resources Department (HRD)	11	Generator & Boiler
4	Compliance & Fire Section	12	Knitting Section
5	Knit dyeing & finishing & Cutting section & Washing Plant	13	Executive Quarter
6	Dinning & Canteen	14	MCD Department
7	Printing & Embroidery Section	15	MCD Stowage
8	Mosque	16	Up going

FAKIR FASHION LTD

Dahargaon, Baliapara, Rupganj, Naryanganj

Issue Date: 25/02/2017



Prepared By

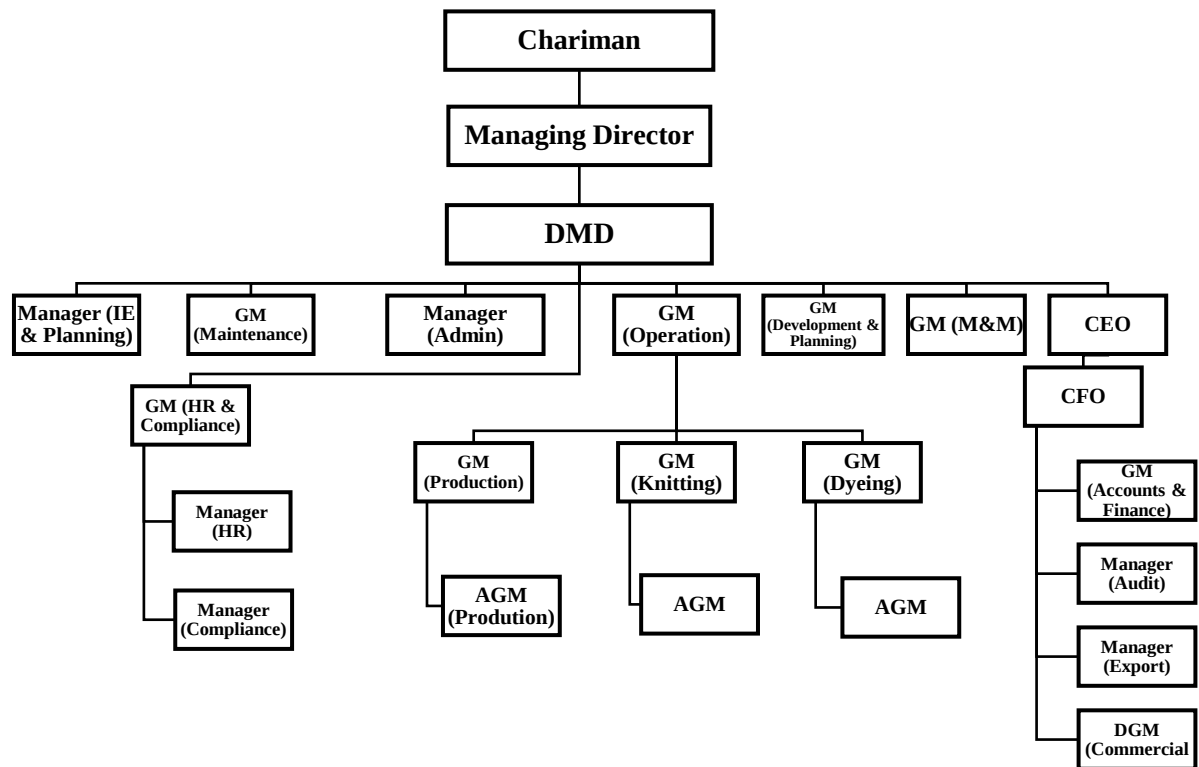
Management Re-representative

Approval Authority

CHAPTER- 02

MANPOWER MANAGEMENT

Organizational Chart of Fakir Fashion Limited



Fakir Fashion Ltd Manpower

SL	Department	Manpower
1	Accounts	30
2	Admin	528
3	Audit	12
4	Business Automation	5
5	CAD	55
6	Civil	12
7	Commercial	40
8	Compliance	15
9	Cutting	743
10	Design &Product Development	18
11	Dyeing	278
12	Dyeing Finishing	249
13	E.C.R & E.T.P	18
14	Embroidery	58
15	Export	21
16	Finance	9
17	Finishing	936
18	G.P.Q	44
19	HRD	66
20	IPE	143
21	IT	6
22	Knitting	243
23	Leftover	75
24	Maintenance	139
25	Management	6
26	Material GPQ	17
27	MCD	520
28	Medical	7
29	Merchandising	85
30	MIS	35
31	Outsource	77
32	Planning	46
33	Printing	653
34	Process Improvement	3
35	Quality Assurance	1159
36	R&D	2
37	R.Q.S	28
38	Sample	332
39	Sewing	3050
40	Supply chain management	25
41	Technical	34
42	Textile Quality	268
43	Washing Plan	158

Management system: or Communication System?

- Intercom telephone
- Fax
- E-mail
- Written letters
- Oral

Note: no need to add job description

Duties & Responsibilities of Production Officer:

1. To collect the necessary information and instruction from the previous shift for the smooth running of the section.
2. To make the junior officer understand how to operate the whole production process.
3. To match production sample with target shade.
4. To collect the production sample lot sample matching next production.
5. To observe dyed fabric during finishing running and also after finishing process.
6. To identify disputed fabrics and report to PM/GM for necessary action.
7. To discuss with PM about overall production if necessary.
8. To sign the store requisition and delivery in the absence of PM
9. To execute the overall floor work.
10. To maintain loading/ unloading paper.
11. Any other assignment given by the authority.

Duties & Responsibilities of Senior Production Officer:

1. Overall supervision of dyeing and finishing section.
2. Batch preparation and pH check.
3. Dyes and chemicals requisition issue and check.
4. Write loading / unloading time from machine.
5. Program making, sample checking, color measurement.
6. Control the supervisor, operator, asst. operator and helper of dyeing machine.
7. Any other work as and when required

Duties & Responsibilities of DGM (Production):

1. Overall supervision of dyeing and finishing section.
2. Check the sensitive parameters of different machines for smooth dyeing.
3. Check the different log books in different areas and report to management.
4. Check the plan to control the best output.
5. To trained and motive the subordinates how to improve the quality production.
6. Control the supervisor, operator, asst. operator and helper of dyeing machine.
7. Maintenance the machinery and equipment.
8. Any other work as and when required

CHAPTER-03

Machine Description

Specification of Knitting Machine:

Single & Double jersey Machine

M/c No	Brand Name	Origin	Dia	Gauge	Type	Needle	Feeder
1	PILOTELLI	China	38	24	S/j	2866	114
2	PILOTELLI	China	38	24	S/j	2866	114
3	PILOTELLI	China	38	24	S/j	2866	114
4	JIUNNLONG	Taiwan	38	24	S/j	2866	114
5	JIUNNLONG	Taiwan	38	24	S/j	2866	114
6	JIUNNLONG	Taiwan	40	24	S/j	3016	120
7	JIUNNLONG	Taiwan	40	24	S/j	3016	120
8	JIUNNLONG	Taiwan	34	24	S/j	2544	102
9	JIUNNLONG	Taiwan	34	24	S/j	2544	102
10	JIUNNLONG	Taiwan	36	24	S/j	2712	108
11	JIUNNLONG	Taiwan	42	24	S/j	3168	252
12	PILOTELLI	China	36	24	S/j	2712	108
13	PILOTELLI	China	36	24	S/j	2712	108
14	PILOTELLI	China	36	24	S/j	2712	108
15	PILOTELLI	China	36	24	S/j	2712	108
16	PILOTELLI	China	36	24	S/j	2712	108
17	PILOTELLI	China	40	24	S/j	3016	120
18	PILOTELLI	China	40	24	S/j	3016	120
19	PILOTELLI	Italy	38	24	S/j	2866	114
20	PILOTELLI	China	38	24	S/j	2866	114
21	JIUNNLONG	Taiwan	36	24	S/j	2712	108
22	PAILUNG	Taiwan	36	24	S/j	2712	144
23	PILOTELLI	Italy	36	24	S/j	2712	108
24	PILOTELLI	Italy	38	24	S/j	2866	114
25	PILOTELLI	Italy	32	20	S/j	2011	96
26	PILOTELLI	Italy	32	20	S/j	2011	96
27	PILOTELLI	Italy	34	24	S/j	2544	102
28	PILOTELLI	Italy	34	24	S/j	2544	102
29	PILOTELLI	Italy	38	24	S/j	2866	114
30	PILOTELLI	Italy	38	24	S/j	2866	114
31	PILOTELLI	Italy	30	20	S/j	2011	90
32	LISKY	Taiwan	32	20	S/j	2010	90
33	LISKY	Taiwan	36	20	S/j	2261	114
34	PAOLO ORGIO	Italy	30			1860	90
35	PILOTELLI	Italy	34	24	S/j	2544	102
36	PILOTELLI	Italy	34	24	S/j	2544	102
37	PILOTELLI	Italy	34	24	S/j	2544	102
38	PILOTELLI	Italy	34	24	S/j	2544	102
39	PILOTELLI	Italy	34	24	S/j	2544	102
40	PILOTELLI	Italy	34	24	S/j	2544	102
41	PILOTELLI	Italy	36	24	S/j	2714	108

42	PILOTELLI	Italy	36	24	S/J	2714	108
43	PILOTELLI	Italy	30	20	S/J	1856	90
44	Lisky	Taiwan	32	20	S/J	2010	102
45	Lisky	Taiwan	36	20	S/J	2261	114
46	Paolo origio	Italy	30	20	S/J	1860	90
47	Pailung	Taiwan	38	18	D/J	4297	72
48	Lisky	Taiwan	34	20	S/J	2136	108
49	Lisky	Taiwan	34	20	S/J	2136	108
50	Lisky	Taiwan	34	20	S/J	2136	108
51	Lisky	Taiwan	34	20	s/J	2136	108
52	Pailung	Taiwan	32	18	D/J	3600	60
53	Pailung	Taiwan	32	18	D/J	3600	60
54	Terrot	Italy	36	24	D/J	5424	
55	Lisky	Taiwan	34	20	S/J	2136	108
56	Lisky	Taiwan	34	20	S/J	2136	108
57	Pailung	Taiwan	32	18	D/J	3600	60
58	Pailung	Taiwan	40	18	D/J	4523	80
59	Pailung	Taiwan	40	22	D/J	5529	80
60	Pailung	Taiwan	40	22	D/J	5529	80
61	Pailung	Taiwan	40	18	D/J	4523	80
62	Pailung	Taiwan	42	18	D/J	4750	84
63	Pailung	Taiwan	30	18	D/J	3392	60
64	Pailung	Taiwan	38	18	D/J	4297	72
65	Pailung	Taiwan	38	22	D/J	5252	72
66	Pailung	Taiwan	38	22	D/J	5252	72
67	Pailung	Taiwan	38	22	D/J	5252	72
68	Pailung	Taiwan	44	18	D/J	4976	88
69	Pailung	Taiwan	30	18	D/J	3392	60
70	Pailung	Taiwan	36	22	D/J	4976	72
71	Pailung	Taiwan	36	22	D/J	4976	72
72	Pailung	Taiwan	34	18	D/J	3845	72
73	Pailung	Taiwan	34	22	D/J	4699	60
74	Pailung	Taiwan	34	22	D/J	4699	74
75	Hangxing	China	28	24	S/J	2111	54
76	Hangxing	China	28	24	S/J	2111	54
77	Hangxing	China	38	24	S/J	2865	54
78	Hangxing	China	36	18	D/J	4071	52
79	Hangxing	China	38	24	S/J	2865	54
80	Paiung	Taiwan	30	24	S/J	2261	48
81	Pailung	Taiwan	30	24	S/J	2261	42

Flatbed knitting machine

M/c No	Brand	Origin	Length	Gauge	Needle
1	Pailong	Taiwan	80	14	1120
2	Pailong	Taiwan	80	14	1120
3	Pailong	Taiwan	80	14	1120
4	Pailong	Taiwan	80	14	1120
5	Pailong	Taiwan	80	14	1120
6	Pailong	Taiwan	80	14	1120
7	Pailong	Taiwan	80	14	1120

INSPECTION M/C

M/C NO.	BRAND	ORIGIN	TYPE	QTY
1-4	UZU	THAILAND	4 Point	4

Specification of Dyeing Machine:

M/C No.	Brand	Origin	Capacity	Loading Capacity
S/01	A/K	Taiwan	30 kg	21 kg
S/02	A/K	Taiwan	30 kg	21 kg
S/03	Fong's	China	30 kg	21 kg
S/04	Fong's	China	50 kg	35 kg
S/05	Sclavos	Greece	30 kg	21 kg
S/06	Sclavos	Greece	30 kg	21 kg
S/07	Sclavos	Greece	50 kg	35 kg
S/08	Sclavos	Greece	50 kg	35 kg
S/09	Sclavos	Greece	50 kg	35 kg
S/10	Sclavos	Greece	50 kg	35 kg
S/11	Sclavos	Greece	30 kg	21 kg
M/11	Sclavos	Greece	150 kg	120 kg
M/12	Airtar	Taiwan	200 kg	150 kg
M/13	Airtar	Taiwan	200 kg	150 kg
M/ 14	Sclavos	Greece	500 kg	450 kg
M/15	Sclavos	Greece	250 Kg	200 kg
M/16	Sclavos	Greece	400 Kg	350 kg
M/17	Sclavos	Greece	1000 Kg	900 kg
M/18	Sclavos	Greece	1600 Kg	1400 kg
M/19	Sclavos	Greece	500 kg	450 kg
M/20	Sclavos	Greece	250 Kg	200 Kg
M/21	Airtar	Taiwan	300 Kg	230 kg
M/22	Airtar	Taiwan	500 Kg	400kg
M/23	Airtar	Taiwan	200 Kg	150 Kg
M/24	Airtar	Taiwan	400 Kg	350 kg
M/25	AK	Taiwan	800 Kg	650 kg
M/26	AK	Taiwan	800 Kg	650 kg

M/27	Sclavos	Greece	300 Kg	250 kg
M/28	Sclavos	Greece	1500 kg	1400 kg
M/29	Sclavos	Greece	1200 kg	1100 kg
S/30	Fongs	China	150kg	120kg
S/31	Fongs	China	50kg	40kg
S/32	Fongs	China	50kg	40kg
S/33	Fongs	China	50kg	40kg
M/34	Sclavos	Greece	1500kg	1200kg
M/3	Sclavos	Greece	1500kg	1200kg
5				

Specification of Chemical & Physical lab & Quality Control Machine:

Sl. No	Machinery	No. of machine	Brand	Origin
1	Spectrophotometer	01	Datacolor	USA
2	Light Box	01	Veri Vide	UK
3	Auto dispenser M/C	01	Co power	Taiwan
4	Solution Maker M/C	01	Co power	Taiwan
5	Mixer	01	Co power	Taiwan
6	Lab Dyeing M/C	04	Co power	Taiwan
7	Shaker M/C	01	Rapid	USA
8	Pilling Assessment Viewer	01	Veri Vide	UK
9	PH meter	04	Jenco	Japan
1	Washing M/C	05	Electrolux	UK
2	Washcator	01	Electrolux	UK
3	Rota Wash	01	Electrolux	UK
4	Tumble Dryer	04	Electrolux	UK
5	Quick Wash Plus	01	Electrolux	UK
6	Xenon Strahler	01	Electrolux	UK
7	Incubator	01	Electrolux	UK
8	Wrap Reel Electronic	01	Sdl Atlas	USA
9	Yarn Evenness Tester	01	Sdl Atlas	USA
10	Pneumatic Bursting Ts.	01	Sdl Atlas	USA
11	Hand Twist Tester	01	Sdl Atlas	USA
12	Crock Meter	01	Sdl Atlas	USA
13	Shaker	01	Sdl Atlas	USA
14	ICE Pilling	01	Sdl Atlas	USA
15	Martindale Pilling	01	Sdl Atlas	USA
16	Sublimation Tester	01	Sdl Atlas	USA
17	Dryer	02	Co power	Taiwan
18	Pad-Mangle	01	Sdl Atlas	USA

Specification of Finishing Machine:

Sl. No	Machinery	No. of machine	Brand	Origin
1	De-Watering	02	Bianco	Italy
2	Hydro extractor	02	Dilmenler	Turkey
3	Slitting M/C	02	Corino	Italy
4	Dryer	01	Santex	Turky
5	Open Compactor	01	Lafer	Italy
6	Tube Compactor	04	Tubetex	Italy
7	Stenter M/C	02	Bruckner	Germany
8	Raising M/C	01	Comet	Italy
9	Inspection M/C	06	UZU	Thailand

Specification of Printing & Embroidery Machine:

Sl. No	Machinery	No. of machine	Brand	Origin
1	Auto Printing/Flash Curing	03	CN Top	Portugal
2	Auto Printing (Round)	08	Roqprint	Portugal
3	Manual Printing (Round)	05	Pro knit print	Bangladesh
4	Manual Printing Table	12		Bangladesh
5	Curing M/C	03	Sroque	Portugal
6	Exposure M/C	01	Sroque	Portugal
7	Embroidery M/c	04	Tajima	Japan
8	Bok M/C	01	Tajima	Japan
9	Heat press m/c	02	Jupitar int.	England

Specification of Cutting & Sewing Machine:

Sl. No	Machinery	No. of machine	Brand	Origin
1	Auto Cutting & Spreading M/C	06	Morgan	Italy
2	Rib Cutting M/C	220	Zoyer	China
3	Overlock M/C	1200	Zoyer	China
4	Flatlock M/C	1200	Zoyer	China
5	Plain M/C	1200	Zoyer	China
6	Button- Eyelet Hole/Attaching M/C	260	Zoyer	China
7	Bartack M/C	80	Zoyer	China
8	Smocking M/C	80	Zoyer	China
9	Kansain M/C	80	Zoyer	China
10	Zig-Zug M/C	80	Zoyer	China
11	Ironing M/C	600	Zoyer	China
12	Metal Detector M/C	06	Morgan	Italy

Specification of Washing Plant Machine:

Sl. No	Machinery	No. of machine	Brand	Origin
1	Washing M/C (Sample)	05	Jiany	China
2	Washing M/C (Sample)	04	Yilmak	Turkey
3	Washing M/C	08	Jiany	China
4	Washing M/C	02	Yilmak	Turkey
5	Washing M/C	04	Aziz Metal	Bangladesh
6	Washing M/C	02	Horizon	China
7	Hydro Extractor	06	Jiany	China
8	Tumble Dryer	16	Jiany	China
9	Tumble Dryer	02	Aziz Metal	Bangladesh
10	Tumble Dryer	02	Yilmak	Turkey
11	PP Spray Dummy & Chamber	06	Aziz Metal	Bangladesh
12	Deep Dyeing M/C	03	Aziz Metal	Bangladesh
13	Brushing m/c	05	Aziz metal	Bangladesh
14	Grinding m/c	06	Toyoda	U.S.A

CHAPTER-04

RAW MATERIALS

Raw Materials

Raw material is a unique substance in any production oriented textile industry. It plays a vital role in continuous production and for high quality fabric.

Types of raw material:

1. Yarn
2. Dye stuff
3. Chemical and auxiliaries
4. Garments auxiliaries

Name and source:

Yarn:

1. Cotton- Ne 30,26, 34,60,20,18 (card/combed)
2. Polyester
3. CVC
4. Slub Yarn
5. Milange- 5%, 10%, 15%
6. Viscose
7. PC (Polyester Cotton)
8. DP (Direct Polyester)
9. Lycra etc.

Dye stuff:

1. Reason
2. Flucozol
3. Nova crone
4. Terasil
5. Fucocion
6. Indosol
7. Synowhite

Chemicals:

Agent	Name
Detergent	Ferrol IPC
Leveling Agent	Persotex DBN
Washing Agent	Sequire P-80, Biostone TCE, Eriopon OS

Wetting Agent	QW,NOB,DA,PCLF
Absorbing Agent	SYNM
Enzyme	SQ-Enz, 383-Enz, Biozep 8000L
Sequestering Agent	Alkaquest SF40
Oil Removing	Supradet NF liq
Anticreasing Agent	Rubine OS, Persotex AFC
Antifoaming Agent	Persotex HT
Stabilizer	S-150
Stripping Chemical	Navaux RC-A, Dam
Brighting Agent	4BK,SYNO
Softening Agent	Maxsoft JT, Silicon
Basic Chemical	Soda Ash, Caustic Soda, Per Oxide, Acetic Acid, Glouber Salt, Hydrosol
Washing Plant	Silicon Softener, Acramine Prifix k, Sodium Metabisulphite, potash etc.

Garments Auxiliaries:

1. Button
2. Eye let
3. Snap Button
4. Many Types of labels
5. Zipper etc.

CHAPTER-05

Production Planning, Sequences & Operation

Knitting Section



S/J M/C



Rib & Interlock M/C



Auto Stripe M/C



Flat bed M/C

Knitting

Knitting is defined as the construction of fabric by interlocking loops of a single yarn with the help of hooked needles. Knitting is the method of creating fabric by transforming continuous strands of yarn into a series of interlocking loops, each row of such loops hanging from the one immediately preceding it. Interlocking consists of forming yarns into loops, each of which is typically only released after a succeeding loop has been formed and intermeshed with it so that a secure ground loop structure is achieved. The loops are also held together by the yarn passing from one to the next.

Types of Knitting:

There are two types

1. Warp Knitting.
2. Weft Knitting.

1. Warp Knitting: In warp knitting, one or two yarn produce vertical column of loops and fabric is produced at length way. In a warp structure, each loop in the horizontal direction is made from a different thread and the no of threads used to produce such a fabric is at least equal to the number of loops in horizontal row. In warp knitting, the threads run thoroughly in a vertical direction. e.g. Net, Mesh fabric etc.

2. Weft or circular Knitting: In weft knitting, one yarn produces a horizontal row of loops and fabric is produced at width way. In a weft knitted structure, a horizontal row of loops can be made by using one thread and the thread runs in direction. horizontal single jersey, rib, interlock etc.

Single jersey:

It requires only one set of needles. The loops are intermesh in only one direction so the appearance of the face and back of the fabric are quite different.

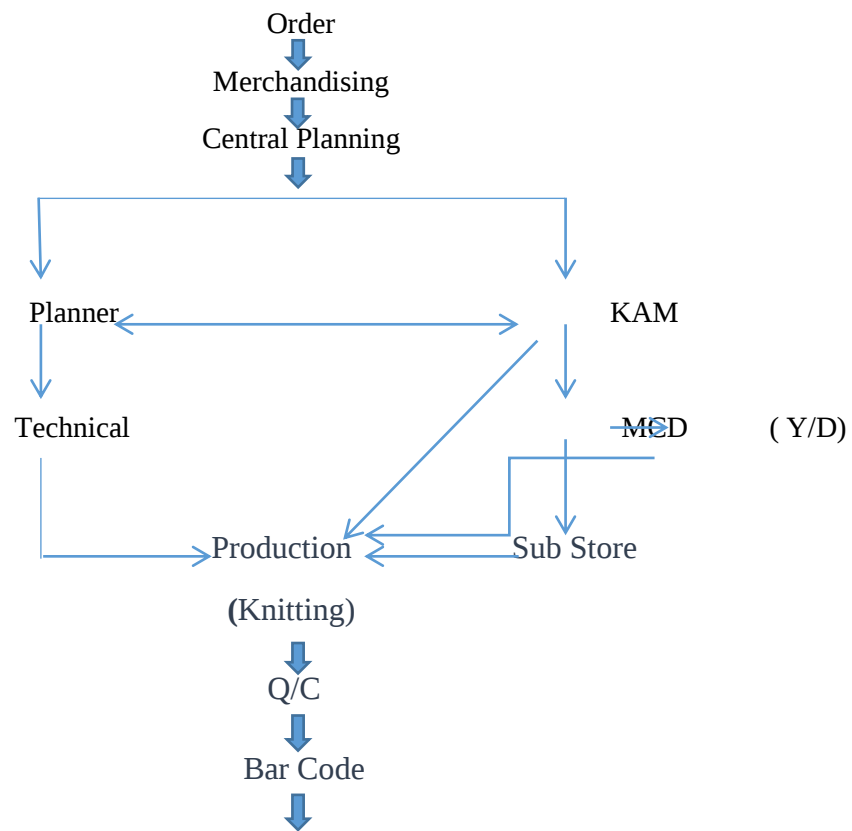
Example: Plain single jersey, Pique, Single & Double lacost, Popcorn, Popcorn Lacost, Fleece, Angle Fleece, Terry, Diagonal Terry, Double Face, Slub S/J etc.

Rib: It requires two sets of needles positioned at right angles to each other to form the fabric. Example: (1x1) Rib, (2x2) Rib, (2x1) Rib, (3x1) Rib, (3x2) Rib, (3x3) Rib, (4x1) Rib, (4x2) Rib, (4x3) Rib, (4x4) Rib, Flat back Rib, Mini open Rib, Automan Rib, Lacost Jersey, Double face jersey etc.

Interlock: Fabric is produced by using both long and short needles. It has a smooth surface on both sides.

Example: Plain Interlock

Process flow chart of knitting



Grey Store



Knitting Floor F F L

Terms of knitting:

Course:

Horizontal row of loops produced by adjacent needles in knitting cycle is called the course of the fabric. A course is a predominantly horizontal row of needle loops produced by adjacent needles during the same knitting cycle called course. (Loop length*No of loop).

Wales: vertical column of loops produced by same needle in knitting cycle is called the Wales of the fabric.

A wale is a predominantly vertical column of intermeshed needle loops generally produced by the same needle knitting cycles, i.e. The number of vertical columns of loop of knitted fabrics is called wale.

Face loop: If the legs of new loop is passes over the old loop is called face loop.

Back loop: if the legs of new loop is passes under the old loop is called face loop.

Stitch density: The term stitch density is frequently used in knitting instead of a linear measurement of courses or Wales; it is the total number of needles loops in a square area measurement such as a square inch or three square centimeters. It is expressed as, Course per inch x Wales per inch.

Stitch length: Length of one loop in the course direction express in mm.

Number of needle: Machine diameter x Machine gauge x 3.1416.

GSM: The weight of one square meter of fabric express in gram is known as GSM.

Needle gauge: The needle gauge of a knitting machine is a measure expressed the no of needle per unit of the needle bed or needle bar, As for example:

1. In case of circular weft knitting machine & Tricot warp knitting machine. [Gauge, N Number of needle per inch.]
2. In case of Rachel war knitting machine. [Gauge, N Number of needle per two inch.]

Needle: There are three types of needle-

1. Bearded needle
2. Compound needle
3. Latch needle-
 - One butt needle.
 - Two butt needle.
 - Three butt needle.
 - Four butt needle.

The most widely used needle is latch 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.

1. Knit cam.



2. Tuck cam.
3. Miss cam.

Knit cam:

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

Tuck cam:

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

Miss cam

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

Sinker:

It is a thin metal plate with an individual or collective operation approximately at right angles at the hook side between adjacent needles.

Function of sinker:

In circular knitting m/c sinker helps to form the loop by holding the yarn.

Loop forming sequence of latch needle:

Latch opening: The needle goes upward and the sinker comes in action to hold down the loop. Then the old loop press down the latch and it gets open.

Yarn receiving: The needle continuous moving upward enough to receive the new yarn. The old loop remains on the open latch that is called tucking on the latch position.

Clearing: The needle goes to its ultimate height to clear the old loop and the new yarn still within the reach of the needle.

Landing: According to the path of cam, the needle starts moving downward. Being pushed by the old loop the latch gets closed and the new yarn is entrapped within the closed hook.

Knock off: The needle continues moving downward. When it reaches at the down position, the old loop slides off from the back of the latch over the tip of the needle. This old loop then taken by the take up roller hangs from the new loop.

Knitting machine: A knitting machine is thus an apparatus for applying mechanical movement, either hand or power derived, to primary knitting elements, in order to convert yarn into knitted loop structures.

To produce different types of knitted fabric from yarn. This may be:

- (a) Single jersey
- (b) Double jersey
- (c) Polo pique

Important parts of weft knitting Machine:

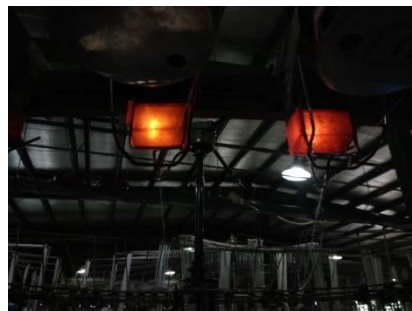
1.CREEL: It is called holder of cone package. packages are placed on creel for feeding the yarn to the machine



2.ALUMINIUM TUBE: It ensures the dust or static electricity free yarn path.



3.STOP MOTION: It senses the yarn is present or not. If the yarn is not present it stops the machine.



4.TENSION DISK: It gives the proper tension to the yarn.



5.KNOT CATCHER: It detects the knot in the yarn and cut.



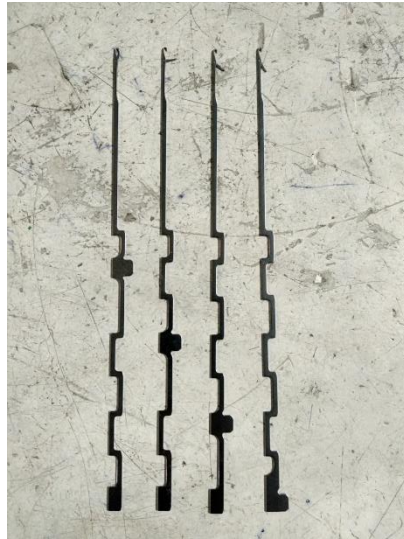
6.VDQ PULLEY: It control the stitch length & GSM of fabric



7.FEEDER: it helps the yarn to feed into the machine.



8.NEEDLE: It is a principle element of a knitting machine. It produce new loop by interloping & release old loop.



9.SINKER: It helps to loop formation, knocking over & holding down.



10.SINKER RING: It is a circular ring. It holds the sinker in the knitting machine.

11.CAM BOX: It holds the cam.

12.CAM: -To provide motion for needle

- To drive the needle
- Provide precious time movement.



13.FEEDER RING: It holds the feeder.

14.MPF WHEEL: It ensures the specific amount of yarn to be feed to the machine.



15.CYLINDER: It holds the needle. It gives rotary movement



16.LYCRA ATTACHMENT DEVICE: Lycra yarn is placed on it.



17.SPREADER: It spread the fabric after being produced.



18.SLITTING DEVICE: The fabric is slit to make it open form.



19.PULLEY BELT: It controls the motion of MPF wheel or other wheel.



20.ADJUSTABLE FAN: It stands on the top of the machine. It remove dust, fly yarn.

21.AIR BLOWER: It also remove dust at high pressure.

22.NEEDLE DETECTOR: When needle jump unnecessary or broke, it detect.



23.TAKE UP ROLLER: To receive the fabric.



FAULTS, CAUSES & THEIR REMEDIES IN KNITTING:

1. Hole Mark

Causes:

1. Holes are the results of yarn breakage or yarn cracks.
2. During loop formation the yarn breaks in the rejoin of the needle hook.
3. If the yarn count is not correct on regarding structure, gauge, course and density.
4. Badly knot or splicing.
5. Yarn feeder badly set.

Remedies:

1. Yarn strength must be sufficient to withstand the stretch as well as uniform. -Use proper count of yarn.
2. Correctly set of yarn feeder.
3. Knot should be given properly.

2. Needle Mark

Causes:

- when needle mark comes along the fabrics.
- if a needle breaks down mark comes on If a needle or needle hook is slightly bends then needle the fabrics.

Remedies:

- Needle should be straight as well as from broken latch.

3. Sinker Mark

Causes:

- when sinkers corrode due to abrasion then sometimes cannot hold a new loop as a result sinker mark comes.
- If sinker head bend then sinker mark comes.

Remedies:

- sinker should be changed.

4. Star

Causes:

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

Remedies:

- Maintain same Yarn tension during production.
- Use good conditioned needles.

5. Drop Stitches

Causes:

- Defective needle.
- If yarn is not properly fed during loop formation i.e. not properly laid on to the needle hook.
- Take-down mechanism too loose.
- Insufficient yarn tension.
- Badly set yarn feeder.

Remedies:

- Needle should be straight& well.
- Proper feeding of yarn during loop formation.
- Correct take up of the fabric& correct fabric tension.
- Yarn tension should be properly.

6. Oil stain

Causes:

- When oil lick through the needle trick then it pass on the fabrics and make a line.

Remedies:

- Ensure that oil does not pass on the fabrics.
- well maintenance as well as proper oiling.

7. Rust stain

Causes:

- If any rust on the machine parts.

Remedies:

- If any rust on the machine parts then clean it.
- Proper maintenance as well as proper oiling.

8. Pin hole

Causes:

- Due to break down or bend of the latch, pin hole may come in the fabric.

Remedies:

- Change the needle

9. Grease stain

Causes:

- Improper greasing
- Excess greasing

Remedies: Proper greasing as well as proper maintenance

10. Cloth fall-out

Causes:

- Cloth fall-out can occur after a drop stitch especially when an empty needle with an empty needle with closed latch runs into the yarn feeder and remove the yarn out of the hook of the following needles.

Remedies:

- make sure all the latches of needle are closed with feeding yarn after a drop stitch.

11. Barre:

A fault in weft knitted fabric appearing as light or dark course wise (width wise) stripe.

Causes:

- This fault comes from yarn fault.
- If different micro near value of fiber content in yarn.
- Different lustier, dye afferent similar classes of fiber is mixed specially in carded yarn & these fibers have similar characteristics.
- in draw fame different similar classes sliver is mixed and make one sliver.

Remedies:

-we can use this fabric in white color.

12. Fly dust:**Causes:**

- In knitting section too much lint is flying to and fro that are created from yarn due to low twist as well as yarn friction. This lint may adhere or attaches to the fabric surface tightly during knit fabric production.

Remedies:

- Blowing air for cleaning and different parts after a certain a certain period of time.
- By cleaning the floor continuously.
- By using ducting system for cleaning too much lint in the floor.
- over all ensure that lint does not attach to the fabric.

13.Yarn contamination**Causes:**

- If yarn contains foreign fiber then it remains in the fabric even after finishing.
- It lot, count mixing occurs.

Remedies:

- By avoiding lot, count mixing.
- Fault less spinning.

14. Yarn faults:

- Neps
- Slubs
- Yarn count variations
- Thick/Thin place in yarn
- Hairiness

CHAPTER-05(b)
DYEING Laboratory

Color Lab



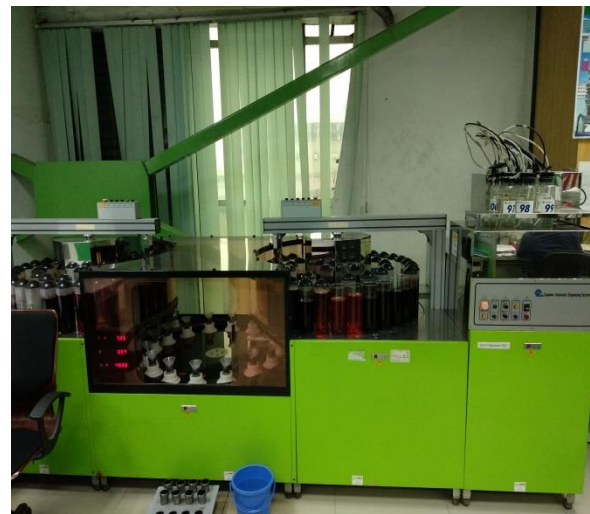
Lab dyeing Machine



Sample making Machin



Datacolor Machine



Auto Dispenser

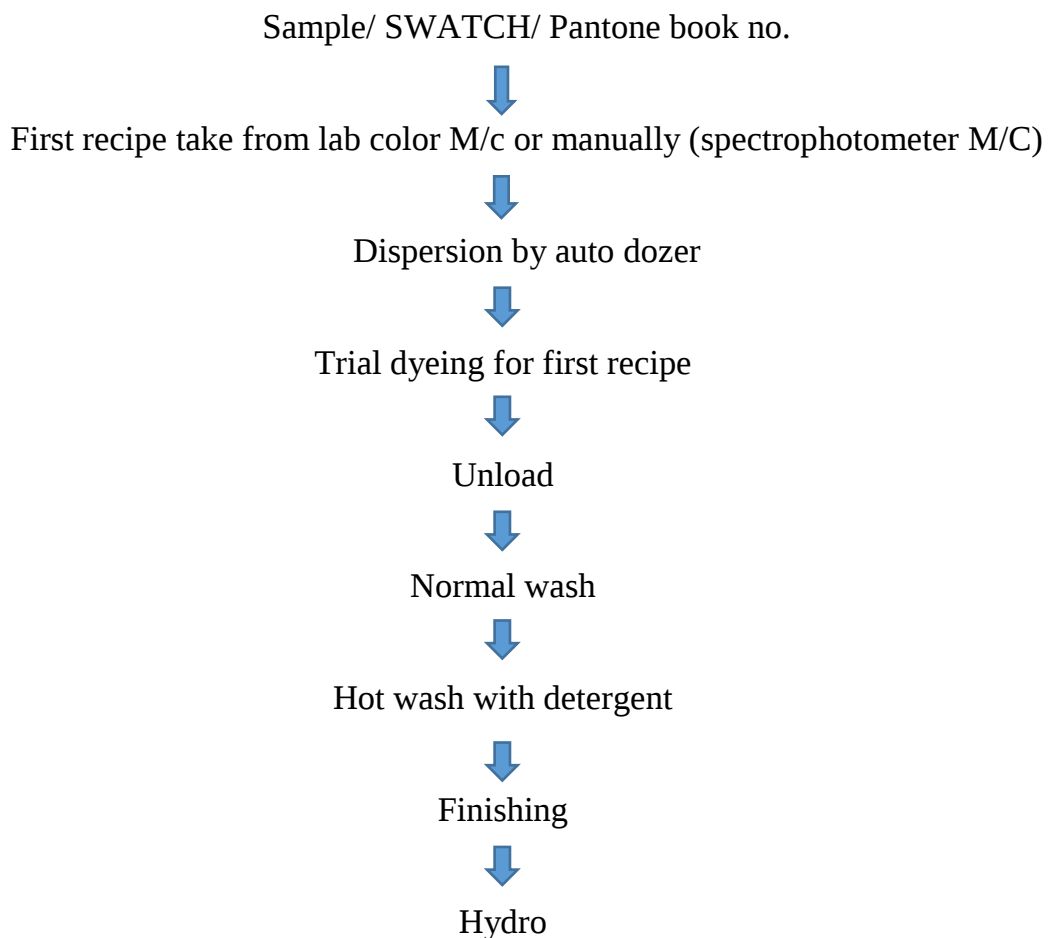
Laboratory

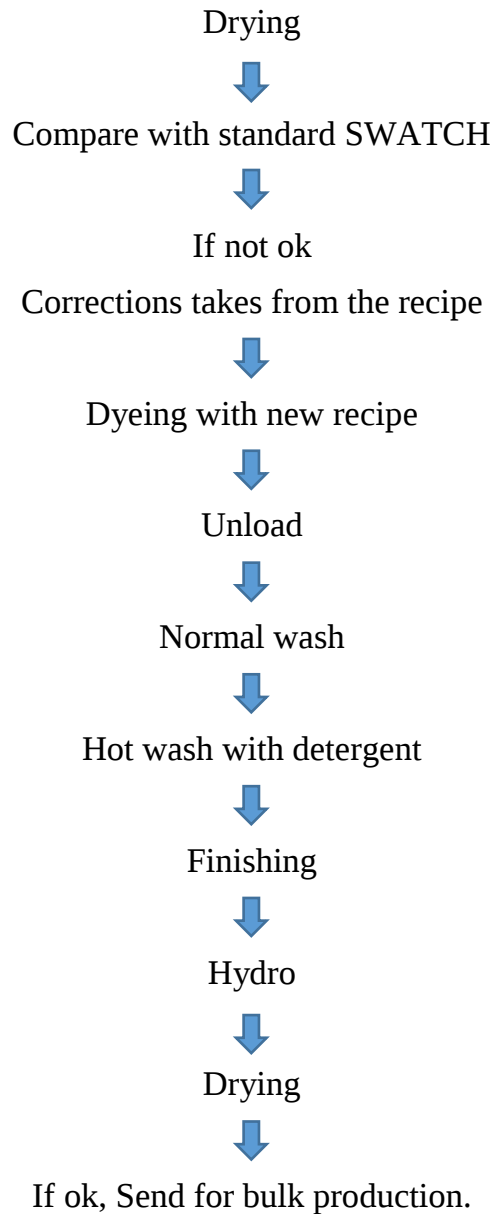
In every dye house a laboratory equipped with machine & essentials equipments. It assists in production prediction, minimization of time consumption and wastage reduction. It is also producing the product of require quality.

Machine Description:

1. Auto Dispenser Machine (Co-power Technology, Tiwan) : It is an automatic detection , gravimetric Dispensing with maximum accuracy . this machine contains 96 tubeless bottle of 1 liter. At a time 16 solution can be made by this machine. As usual Reactive and Direct dye solution are made by it.
2. Solution Maker Machine (Co-power Technology, Tiwan): 6 liters can be made in 6 different bottles and mixed automatically at a time in this m/c.
3. Lab Dyeing M/C (Co-power Technology, Tiwan): 24 samples in different tubes can be dyed in rotating chamber . it takes 45 minutes to raise the temp. from 30⁰ c to 130⁰ c.
4. Lab Deep Wash M/C: Hot wash is done by this M/C, this M/c runs at 95⁰ c.
5. Data Color M/C: This M/c can give an approximate recipe of a desired color by placing a sample in its sensor.
- 6.

Laboratory work sequence flow chart:





LAB-DIP PROCEDURE

Lab dip is nothing but a process by which buyers supplied swatch is matched by varying dyes percentage in the laboratory with or without help of "DATA COLOURR".

Prior to the production, lab-dip plays a vital role in shade matching& detaching the characteristics of the dyes and chemicals to be used in the large scale of production so this is an important task before bulk production.

In JK KNIT COMPOSITE LID has well established laboratory with modern mach and Equipment's.

At first, Dye of the standard sample is measured by Computer color matching system. Then by taking that recipe lab in-charge produces lab trial and match with the standard according to buyer requirements. After approving the sample, this sample is sent for bulk production with recipe.

Dyeing process for Light and Medium color:

Dyeing procedure:

-Liquor ratio- 1:10

-Add auxiliaries +dye+ salt + soda at 40°C and for run for 5 min.

-Set temperature, gradient 2°C/min up to 60°C.

-For Turquoise color gradient should be set 2°C/min up to 70°C or 80.

-At 60/80°C run 60 min.

Dyeing process for dark color:

Method: Step by step.

Dyeing procedure:

- 1.Liquor ratio 1:6 for dark color
- Add dye + salt + alkalis at 40°C @ run time 20 minutes.
- Add soda ash + caustic soda set gradient 2 deg/minutes up to 85
- Turquoise gradient should be set 2°C/mins up to 85°C
- At 65/85°C run time 80 minutes for dark shade.

Washing off:

- Rinse the sample in running cold until clear water comes out.
- Put in to warm water containing 0.5g/lit acetic acid for 5 minutes.
- Rinse in hot water then b off in 500ml containing with 1g/lit RSK for 2 minutes
- Rinse hot and cold water.
- Dry up and condition for 30 minutes before assessing the shade.

TESTS PERFORMED IN KNIT DYEING:

*Rubbing test:

1. Purpose:

The fastness test to rubbing is used on a variety of fabrics to evaluate the transfer of surface dye from the rest fabric when it applied surface friction or rubbed against a rough surface.

2. **Apparatus:** Crock-meter and Grey scale.

3. **Method:** ISO-105*12

4. Test specimen:

. Sample Fabric size: 250mm X 50mm

. Crocking Fabric size: 50mm X 50mm

The crocking cloth against which then sample will be rubbed is a white, bleached, un-finishing and un-dyed cotton fabric.

5. Procedure:

At first the sample is placed with tab over the metallic plate. Then the crocking cloth is set in the crocking pin (peg) with clip. Then the test specimen is rubbed to & fro (10 X 10 rubs, 1 rub/sec) by means of crock meter's finger. Finally the crocking cloth is removed from the peg. In case of wet rubbing test, the crocking cloth is dried at room temperature.

6. Evaluation:

Compare the contrast untreated and treated white crocking cloth with the staining grey scale.

Again, color contrasts of rubbed and un-rubbed dyed samples are compared with color changing grey scale.

For both type of rubbing test, the fastness is rated from 1 to 5, where 1 means worst rubbing fastness and 5 means excellent fastness.

Types of Tests:

1. Shrinkage Test
2. Color Fastness to Rubbing
3. Color Fastness to perspiration- Acid, Alkali
4. Color Fastness to Water
5. Color Fastness to saliva
6. P^h
7. Color Fastness to Light
8. Pilling Test
9. Bursting Test
10. Phenolic Yellowing

Machines

Name of machine					Brand	Origin	Quantity	Function
Orbital shaker	GFL	China	1	P ^H test				
Pilling Tester	James Heal	England	1	Pilling test				
Pilling Tester	Orbiter	England	1	Pilling test				
Crock Master	James Heal	England	1	Rubbing test				
Pn Burst	SDL atlas	England	1	Bursting test				
Sublimation tester	SDL Atlas	England	1	Sublimation test				
Oven Incubator	SDL Atlas	England	1	Perspiration & phenolic yellow				
Sunset CPS	SDL Atlas	England	1	Light Fastness Test				
Warp Reel Machine	SDL Atlas	England	1	Count tester				
TPI Machine	SDL Atlas	England	1	TPI testing				
Perspire Meter	SDL Atlas	England	1	Perspiration				

Rota Wash	SDL Atlas	England	1	Wash
Quick Wash				SDL Atlas
Washing machine				Electrolux
Tumble Dryer				Electrolux
				England
				1
				Dimensional stability test
				Sweden
				3
				Dimensional stability test
				Sweden
				2
				Drying

Color fastness to perspiration:

1. Purpose:

To assess the degree of change of shade of cross staining due to perspiration.

2. Apparatus:

Chemical balance accurate to 0.01 gm. volumetric flasks, beaker, ph meter, Petri dishes, glass plate, multi fabric (100mm X 50mm) cut in half to give two samples (50mm*50mm), time and incubator to maintain temperature 37 + 2 c.

3. Method: ISO 105 E04

4. Reagent:

Alkaline solution:

- L-histadine monohydrochlorde mono-hydrate 0.5gm/lit
- NaCl 0.5gm/lit
- Di-sodium hydrogen orthophosphate 2.5gm/lit
- Dilute the solution in one liter distill water
- pH 8+_0.05 with 0.1 mol/lit (0/IN) NaOH.
- L Histadine monohydrochloride monohydrate 5gm/lit
- NaCl 5gm/lit
- Sodium di-hydrogen orthophosphate dehydrate 2.2gm/lit
- Dilute the solution in one liter distil water.
- pH 5.5+_0.05 with 0.1 mol/lit (o/IN) NaoH.

5. Test specimen: Fabric size 4cm X 10cm.

6. Procedure: (Alkaline Perspiration)

- Keep the specimen in contact with S.D.C multifibre stripe of 4cm X 10cm size.
- Weight and soak then specimen in a dish with alkaline solution at a liquor ration of 50:1.
- Allow the specimen to soak for 30 minutes.
- Place the specimen glass slide and lighty scrap of with a glass rod.
- Place the specimen incubator for 4hrs at 37 C. Then remove from incubator open out and keep sometime in open air.
- Repeat the same process with another specimen using the acid solution.

Assessment:

Assess the change in color of each specimen and the staining of the multi fibre strip using the light grey scale.

7. **Procedure:** (Acid perspiration)
Same as the alkaline perspiration.
8. **Report:**

Record the change of shade of the specimen & the staining of the individual components of the fabric adjacent fabric scarately for both the acid and alkali test.

Wash fastness:

A. Purpose:

The resistance of color of any dyed of printed material to washing is known wash fastness.

B. Apparatus:

Wash fastness tester, Grey scale Multi fibre.

C. Method: ISO-CO6.

D. Test specimen:

For Fabric: Fabric size 10cm X 4cm

Multi Fibre Fabric: Multi Fibre Fabric size 10cm X 4cm

E. Reagent:

- | | |
|--------------------------------------|-------------------|
| i. ECE detergent B | 4g/1t |
| ii. Na-per borate tetra hydrate | 1g/1t |
| iii. pH | 10.5+_1 |
| iv. time | 30 min |
| v. Temperature | 60 ⁰ c |
| vi. No. of still ball (on condition) | 10/25/ 50 |

F. Procedure:

i. Weight the specimen and calculate the volume of wash liquor required as ISO-105-CO6 method.

ii. Place the specimen in the containerType equation here. with the wash liquor.

iii. Run the machine and raise the tempo at the rate of 60 c. Being the timing the rest for 30 min.

iv. At the end of the test, place the specimen in the beaker and wash with 2 liter distilled water for 2 min & continuously stirring. Then wash with running tap water for 2 min. Excess water removed by hand squeeze.

G. Drying:

Drying in a fully automatic dryer at a temperature not more than 60 °C. Then keep in relax for 1 hours.

H. Assessment:

Color change: The original and tested dyed samples are placed side by side, oriented in the same direction along with color change grey and compare the contrast between the treated dyed sample and the same untreated sample with the appropriate pair of color change grey scale. If there is no color change, then its rating will be 5.

Color staining:

Again, compare the contrast between the untreated white fabric and the stained white with the appropriate pair of gray white samples of the Grey scale for staining.

Washing off:

1. Rinse the sample in running cold until clear water comes out.
2. Put in to warm water containing 0.5g/lit acetic acid for 5 minutes.
3. Rinse in hot water then boil off in 500ml containing with 1g/lit PSK for 2 minutes.
4. Rinse hot and cold water.
5. Dry up and condition for 30 minutes before assessing the shade.

Available stock solution

- Red-0.1%,0.5%,1.0%,2.0% (very common)
- Yellow-0.1%,0.5%,1.0%,2.0% (very common)
- Blue-0.1%,0.5%,1.0%,2.0% (very common)

Preparation:

- To prepare 0.1% Stock solution, it is necessary to mix 0.1 g dye and 100 cc water.
- To prepare 0.5% Stock solution, 0.5 g dye stuff is mixed with 100 cc water.
- To prepare 1.0% & 2.0% stock solution similar procedure is followed.

- To prepare 10% stock solution of soda ash, 10 g soda is mixed with 100 cc water.

Depth of shade:

Concept knitting Ltd. produces 0.5% to 5% shade for the goods.

Wash process:

- ⇒ Rinsing the sample in cold water.
- ⇒ Hot rinse.
- ⇒ Acid wash at 50 ° c 0.5 gm/ liter.
- ⇒ Soaping 95° c 10 min.
- ⇒ Cold rinse.
- ⇒ Dry.

Shrinkage: Shrinkage is the Dimensional stability that measure after Washing and Ironing. The result showed the percentage of dimensional change.

Process:

- Cut the Fabric by templet (35 X 35) inch. Make Dummy for H & M and for other Buyer Open format.
- Washing by Detergent. 10 grams Detergent for each Sample. Wash for 5 times.
- Drying. Tumble or Line Drying is Done.
- Measurement

Shrinkage:

Shrinkage is the Dimensional stability that measure after Washing and Ironing. The result showed the percentage of dimensional change.

Process:

- Cut the Fabric by templet (35 X 35) inch. Make Dummy for H & M and for other Buyer Open format.
- Washing by Detergent. 10 grams Detergent for each Sample. Wash for 5 times.
- Drying. Tumble or Line Drying is Done.
- Measurement

Color Fastness to wash:

Recipe:

ECE detergent – 4 gm/l

Sodium Perborated 1 gm/l

Distilled Water: Distilled Water

Method: ISO 105-C06

Process: A 4 X 10 cm sample is cut then a multi fabric Adjusted. Use Rota Wash for 30 min and then the multi fabric checked.

Perspiration Test(Acid)

Recipe:

Sodium Chloride – 5gm

Hstadin

Mono Hydro Chloride mono Hydred – 0.5 to 1 ml

P^h – 5.5

Sodium Di-Hydrogen Orthophospet: 2.2 ml

Perspiration Test (Alkali)

Recipe:

Sodium Chloride: 5 gm

Mono hydro chloro mono hydride : 0.5 ml

P^h – 8

Sodium di hydrogen Anthrospohet – 2.5 ml/ L

CFT to Saliva:

Sodium Chloride- 4.5 gm

Sitric Acid – 3mm/l

KCl: 0.3 gm/L

Process:

1. Sample wet in a cup for 30 min. Liquor is 50 ml
2. Just squeeze the sample.
3. Set perspiration meter.
4. Set the meter in oven for four hours in 60⁰ c
5. Then Grading is done.

P^H measurement:

Name of the M/C: GFL

Capacity: 12 sample.

Time: 15 hours.

Fabric cutting size: 0.5 cm 100 ml KCl

Sun test CPS+

light fastness test M/C.

m/c name: Atlas.

Ultra violet light used.

Time: 18 hours

Fabric sample: 2X2 inch.

Capacity: 1 sample.

Yarn twist tester:

To measure yarn twist.

Appearance Tester

m/c name: Atlas.

Oven

m/c name: James Heal & Atlas.

Use: To dry the fabric.

Bursting tester

Brand name: James Heal & Atlas.

Use: To measure the strength of fabric.

Time: 20 sec.

Result in KPa

Pilling tester

Brand: Martindale & James Heal.

Time: set by buyer requirement.

Sample quantity: for James Heal: min: 2+2, max: 6+ 6

Fabric size: 14X14 cm

Rubbing test:

(CF to rubbing)

m/c name: Crock Master

Brand: James Heal

Time: 10 sec

Type: dry and wet.

Remarks:

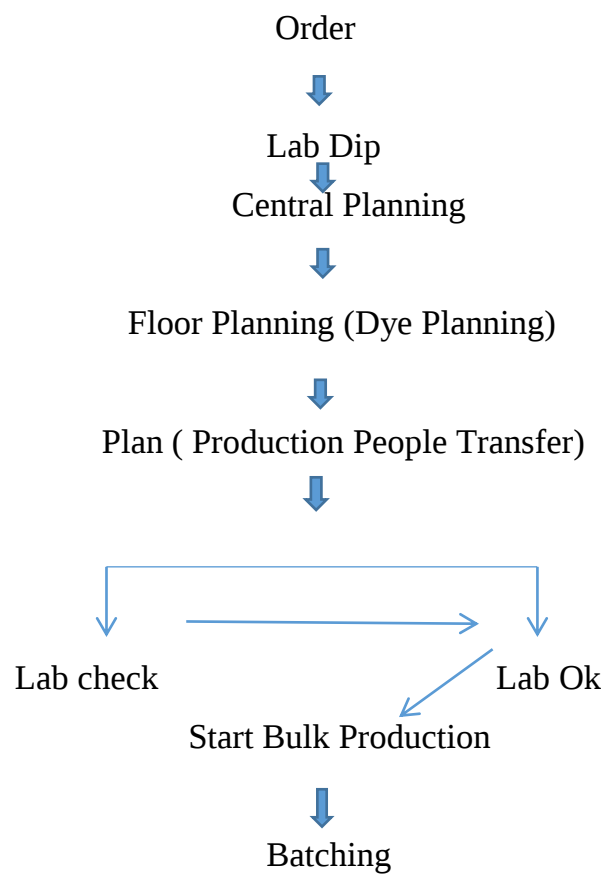
This laboratory is established according to the reference of M & S (Mark & Spencer). In laboratory, they are maintaining a very good environment.

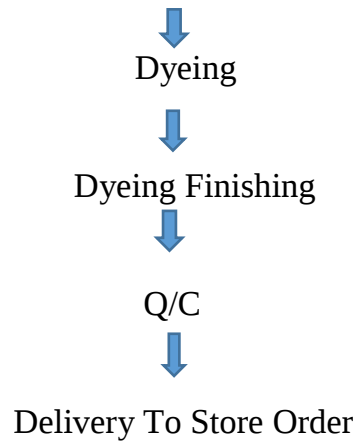
To bulk production, laboratory plays a vital role in shade matching and detaching the characteristics of the dyes and chemicals to be used in the large scale of production. But here should be room temperature control optimum level. Required pH meter, Daylight box. Should be use clean water.

CHAPTER- 5(c)
Dyeing Department

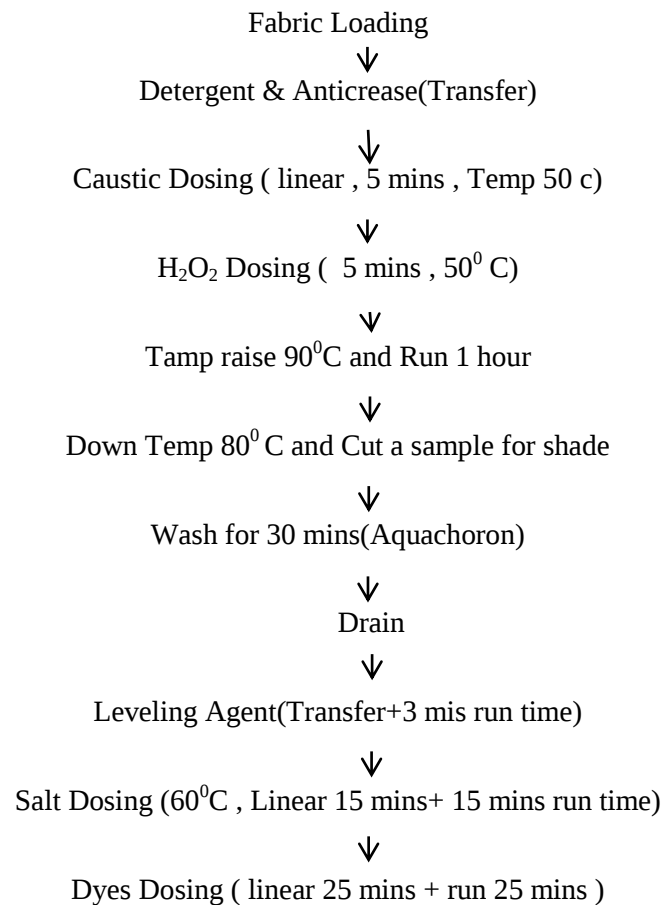


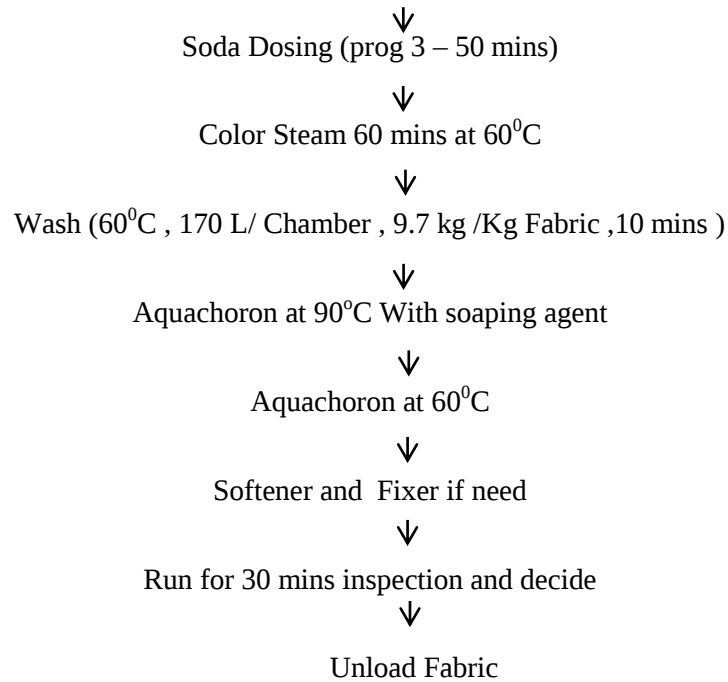
Dyeing work sequence flow chart:



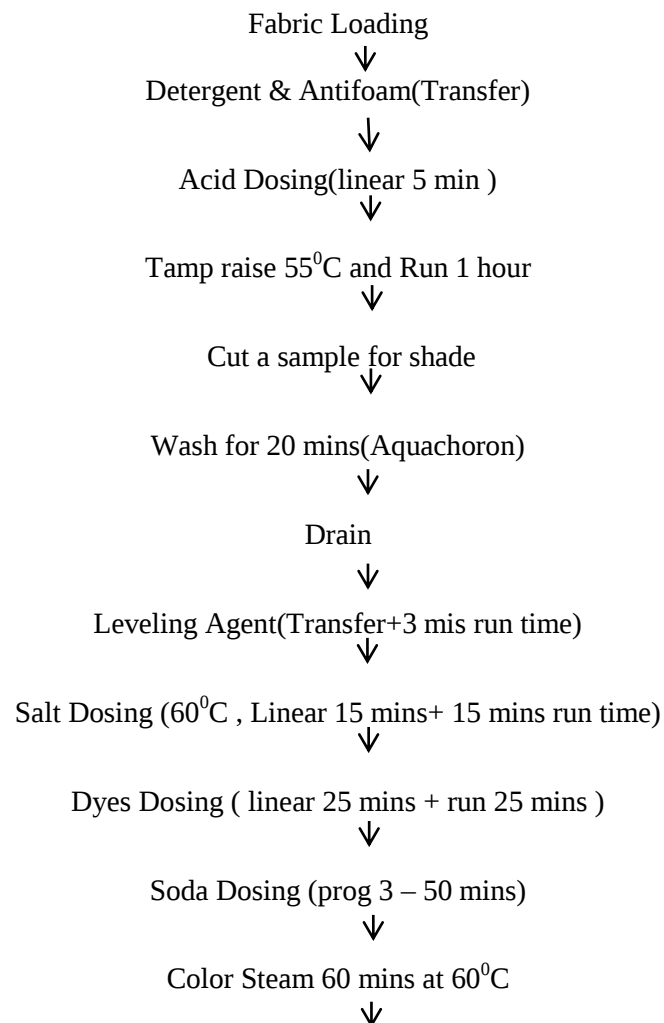


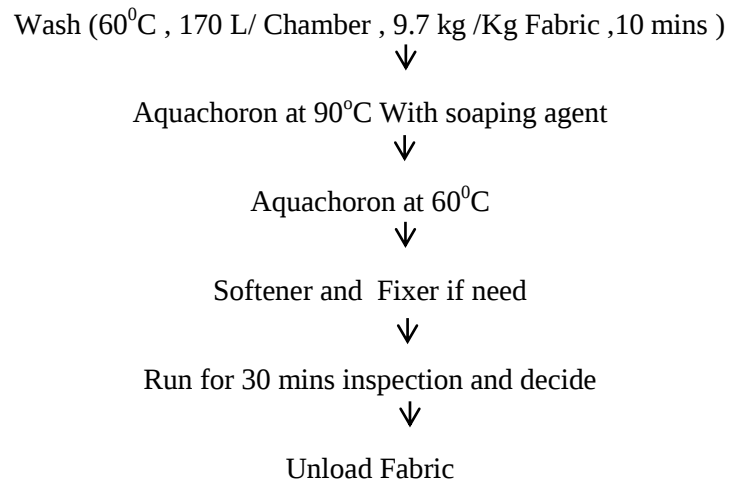
Flow Chart for light shade of cotton fabric



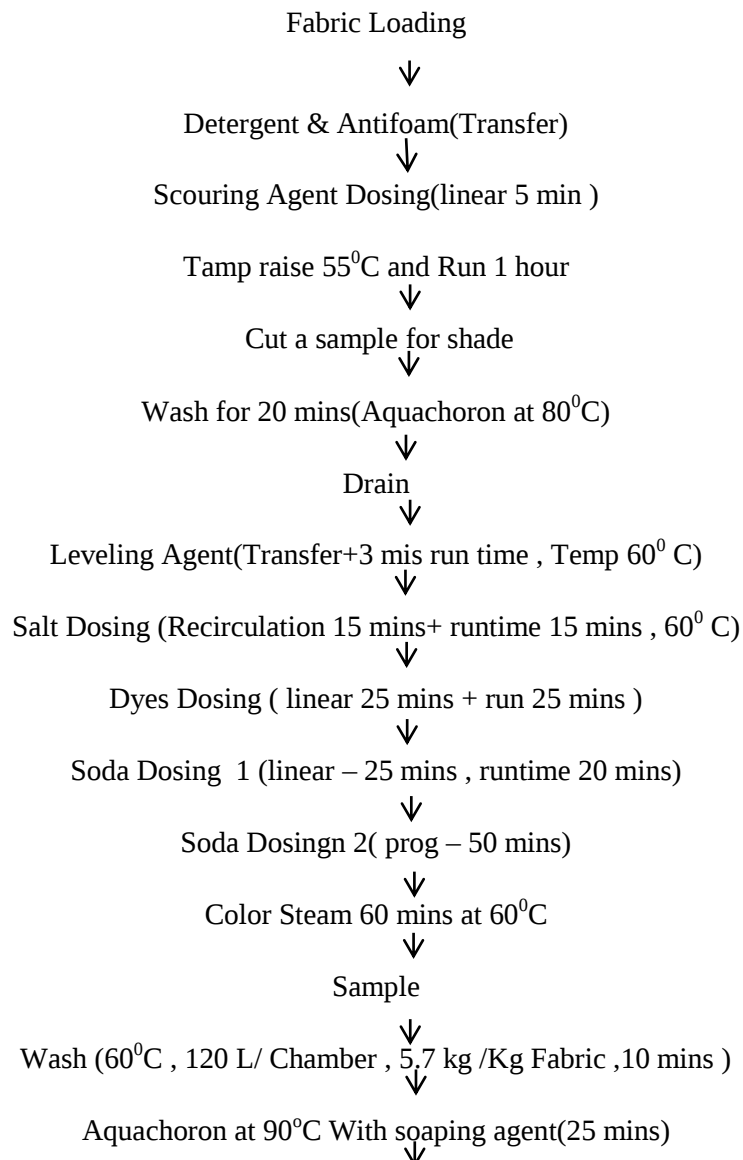


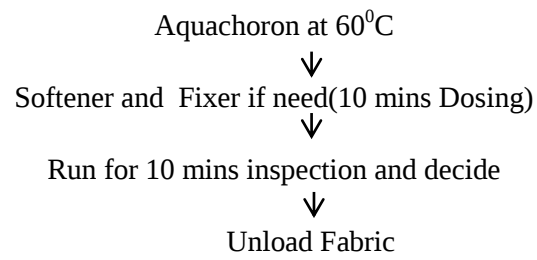
Flow Chart for Medium shade of cotton fabric



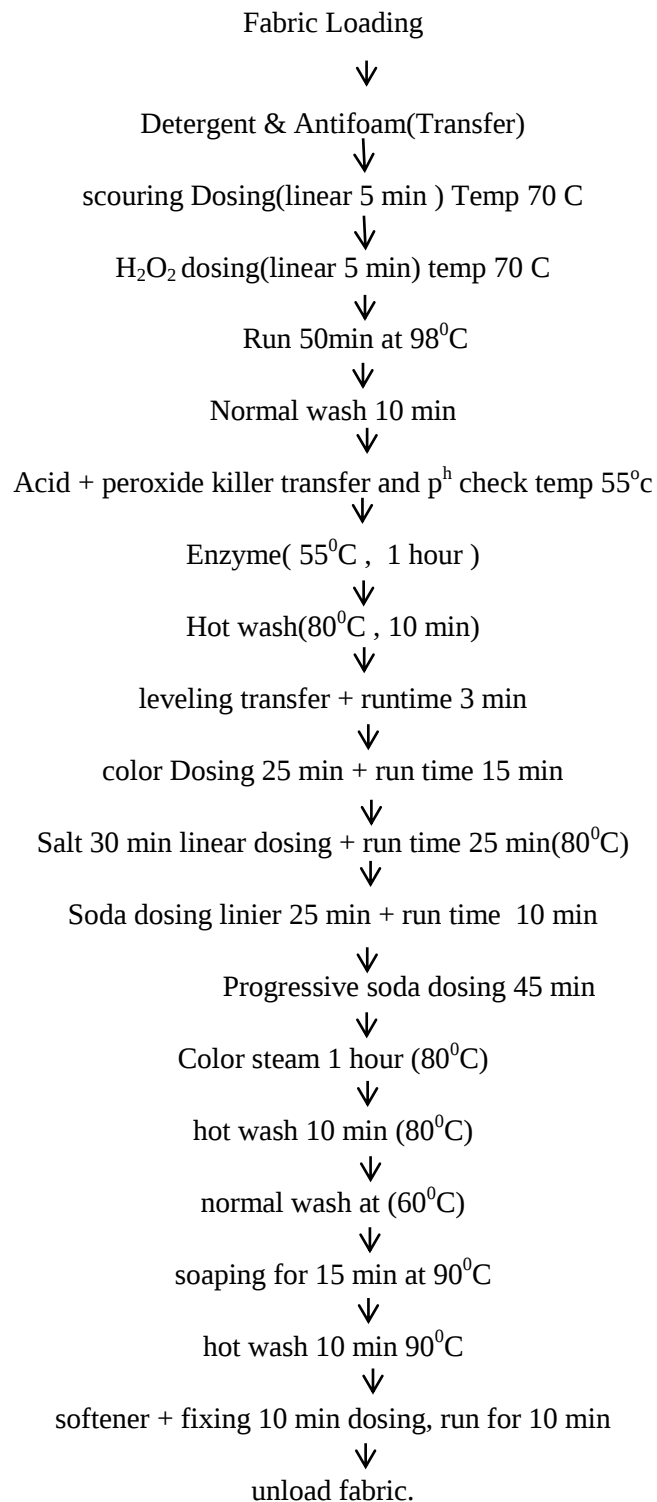


Process Flow Chart For Dark/Navy/Black/Extra dark color





Process Flow Chart For Turquoise Color



Process Scheme:

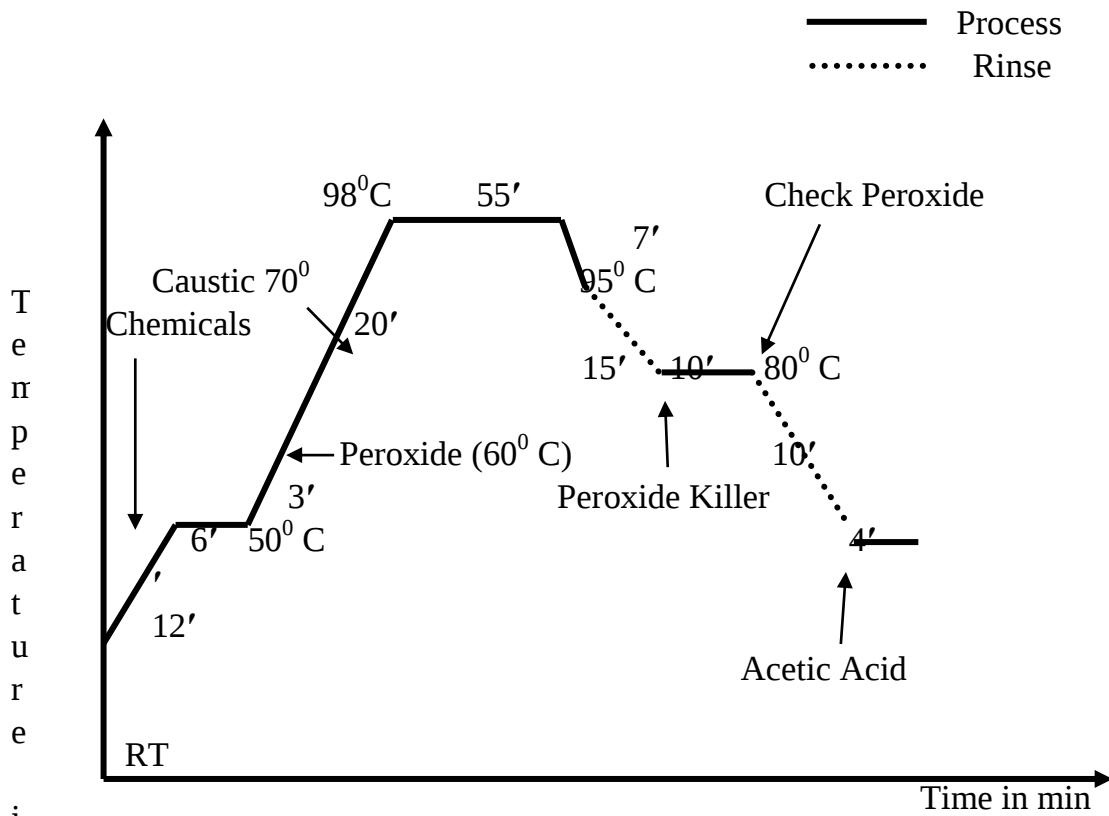


Fig: Pretreatment Process

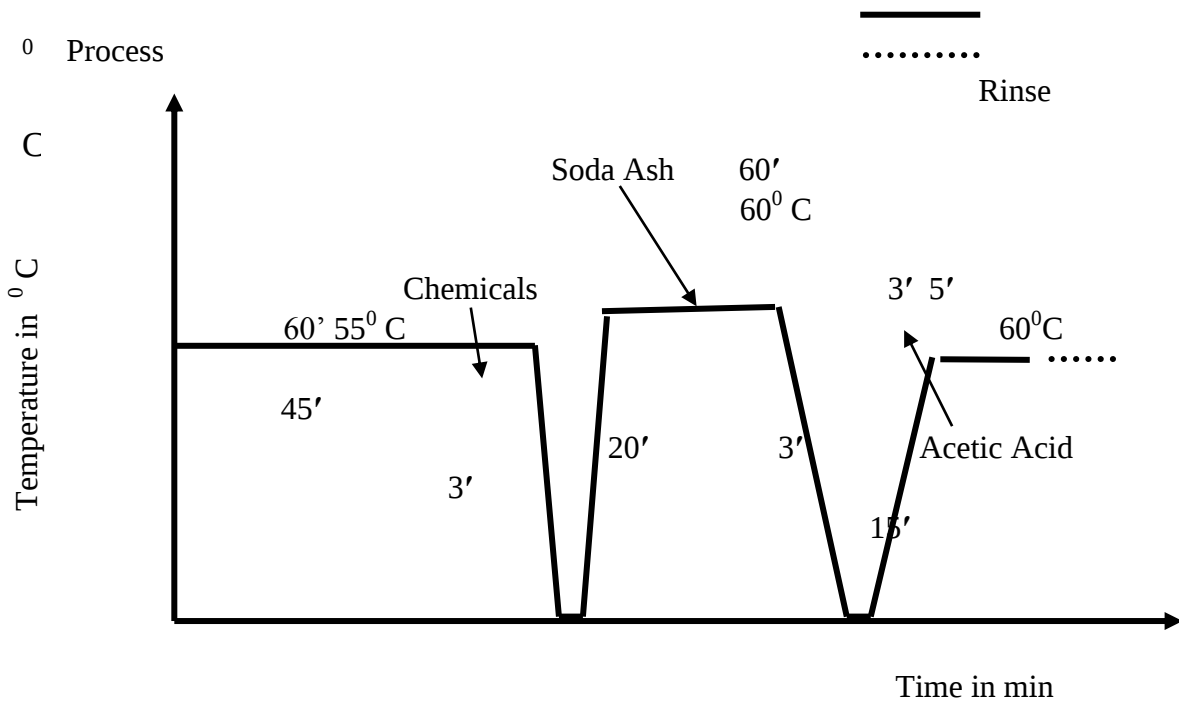


Fig: Enzyme Process

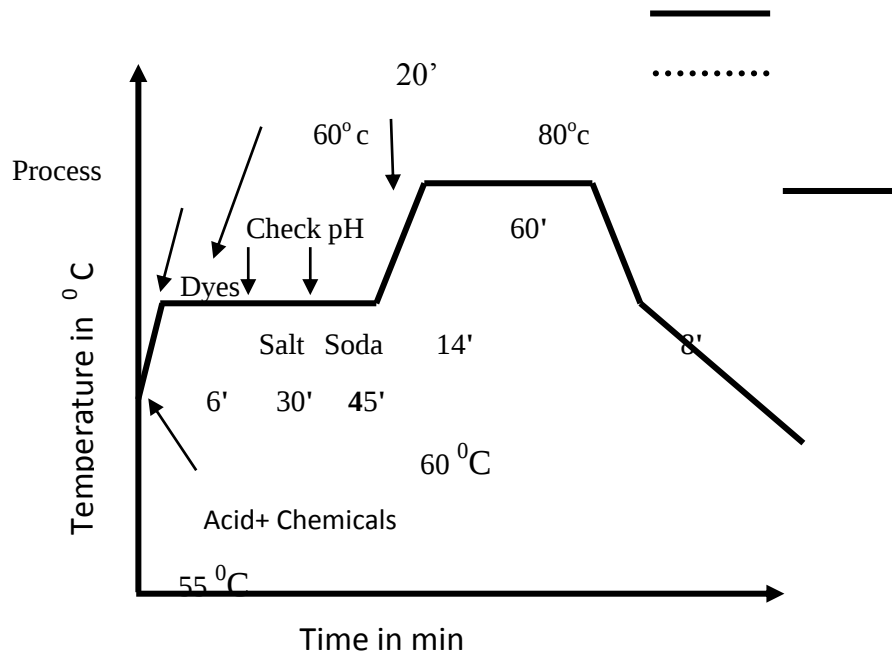


Fig: Dyeing Process (Turquoise)

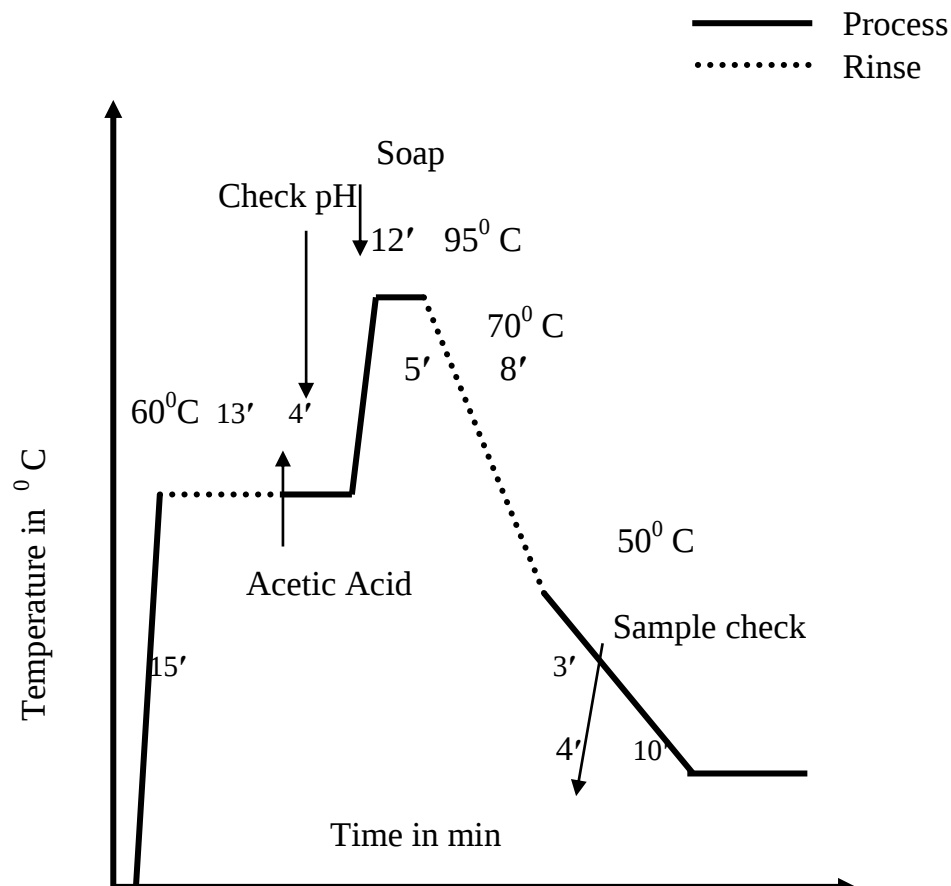


Fig: Soaping Process

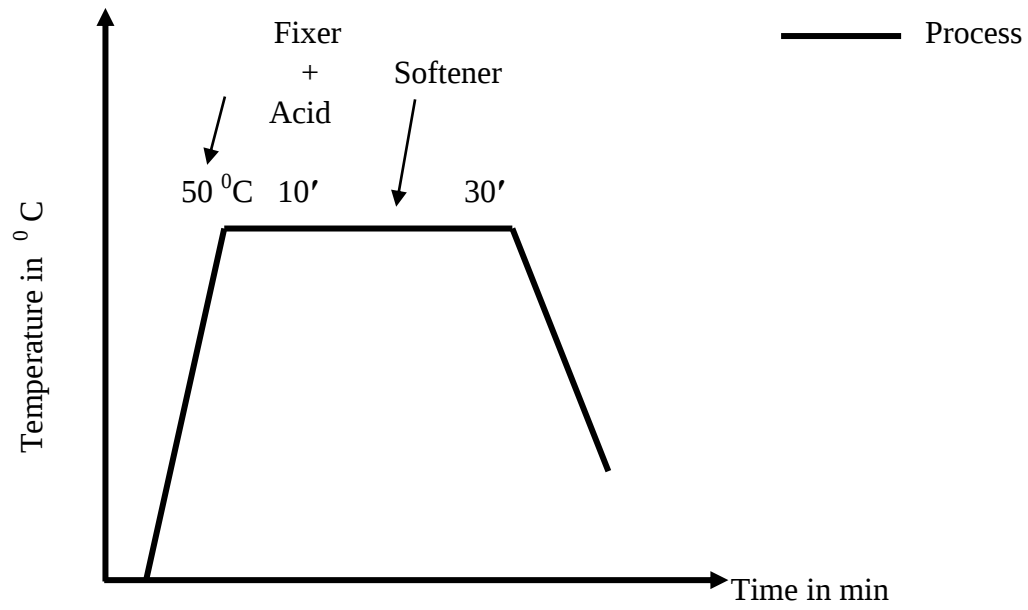
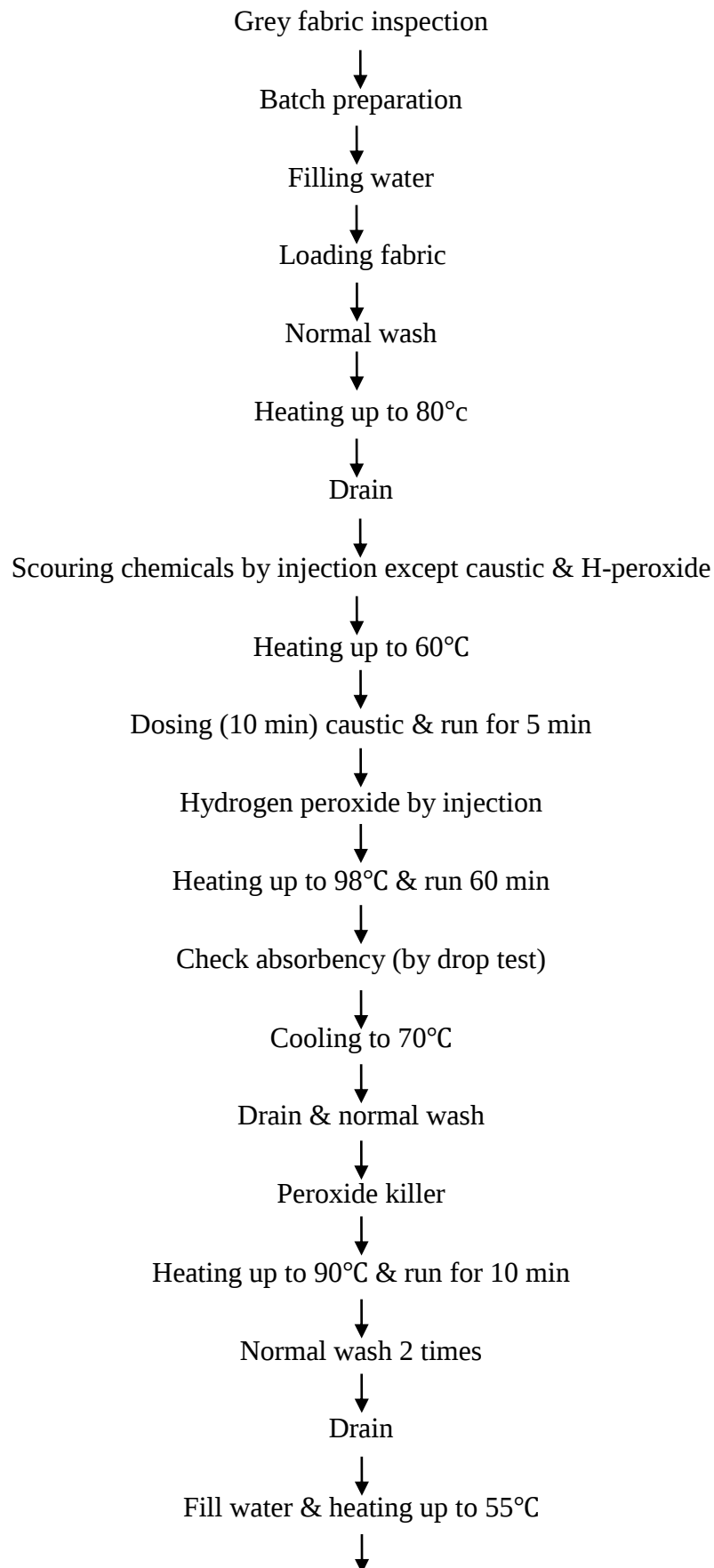


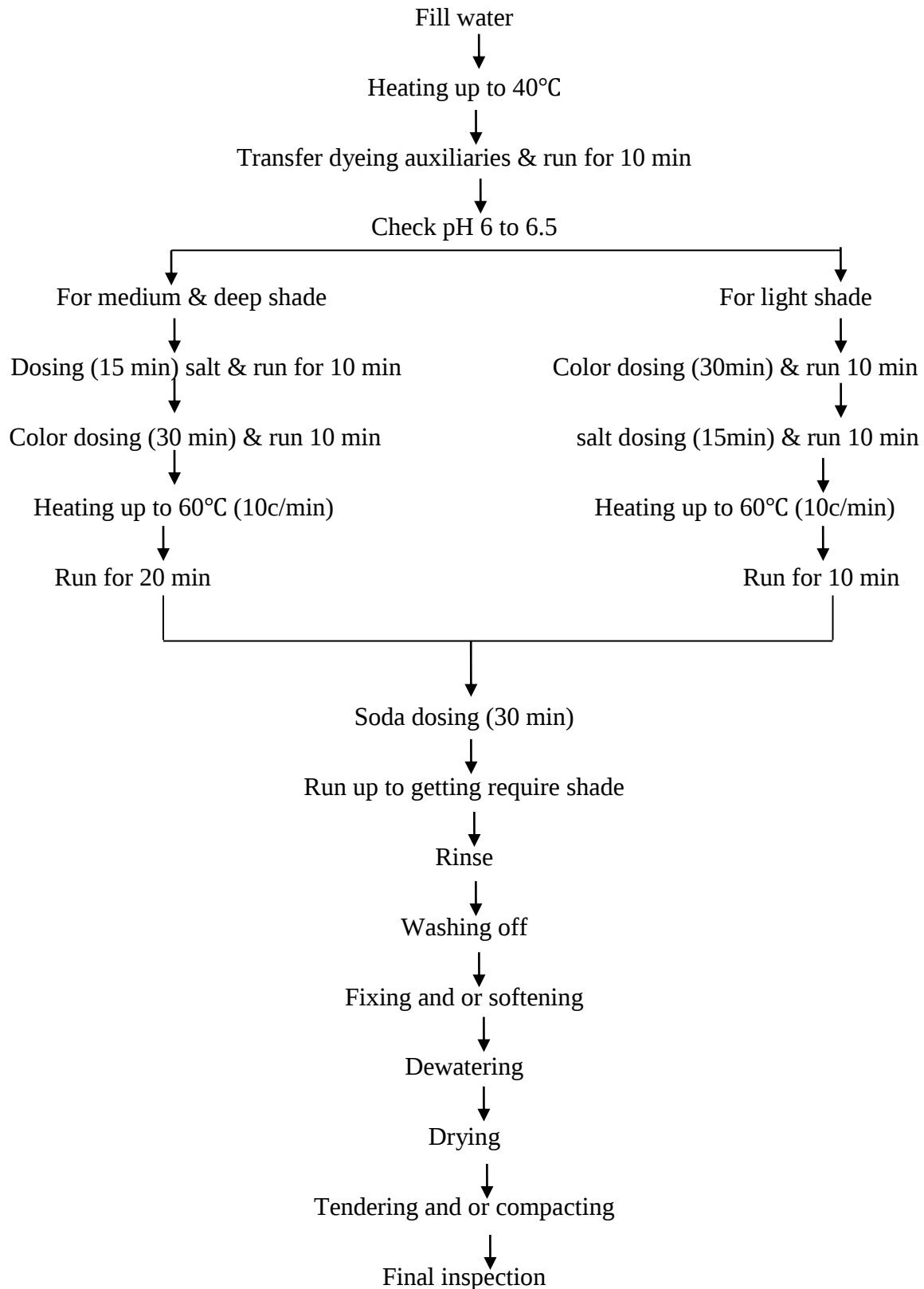
Fig: Softening Process

Flow chart diagram scouring and bleaching operation:



Neutralizing with Acetic acid by injection & run 10 min

Chart diagram of 100% cotton dyeing operation:



Packing & Delivery

Common fault in knit dyeing:

a) Fabric faults creating during 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 seating
- 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 higher material speed
- Low liquid 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

b) Running problem:

1) Ballooning:

* Causes:

- Seamen joining with too densely sewn

*** Remedies**

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

2) Intensive foaming:

*** Causes:**

- pumping a mixture of air and water

*** Remedies:**

- By using antifoaming agent

c) Dyeing faults & their remedies:

1) Uneven dyeing:

*** Causes:**

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

*** Remedies:**

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

2) Shade variation (batch to batch):

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

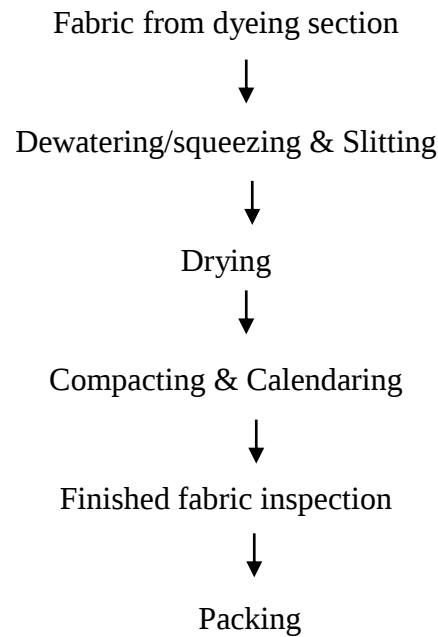
- Use standard dyes and chemicals
- Maintain the same liquor ratio
- Follow the standard pretreatment procedure

CHAPTER- 5(D)

DYEING FINISHING DEPARTMENT



Finishing process sequence:



Fabric Quality Inspection:

The quality of a final garment depends on the quality of a fabric when it is received as a roll. Even the most outstanding manufacturing methods cannot compensate for defective materials. Normally, we inspect 10% of the rolls we receive and evaluate them based on a four-point system. This way, we can avoid fabric related quality problems before it is put into production.

Four-point system:

Amount to select:

Inspect at least 10% of the total rolls of the shipment.

Selection of rolls:

Select at least one roll of each color. If more than one role must be selected, then choose the additional roles in proportion to the total number of roles per color received.

Defect Classification (Four-point System):

Size Defect penalty.

3 inches or less 1 point

Over 3 inches, but less than 6 2 points

Over 6 inches, but less than 9 3 points

Over 9 inches 4 points

The length of the defect is used to determine the penalty point. Only major defects are considered. NO penalty points are assigned to minor defects. (A major defect is any defect that would cause a final garment to be considered a second.)

Major Defects:

Major woven fabric defects include but are not limited to slubs, holes, missing yarns, yarn variation, end out, soiled yarns and wrong yarn.

Major dye or printing defects are out of register, dye spots, machine stop, color out smear or shading.

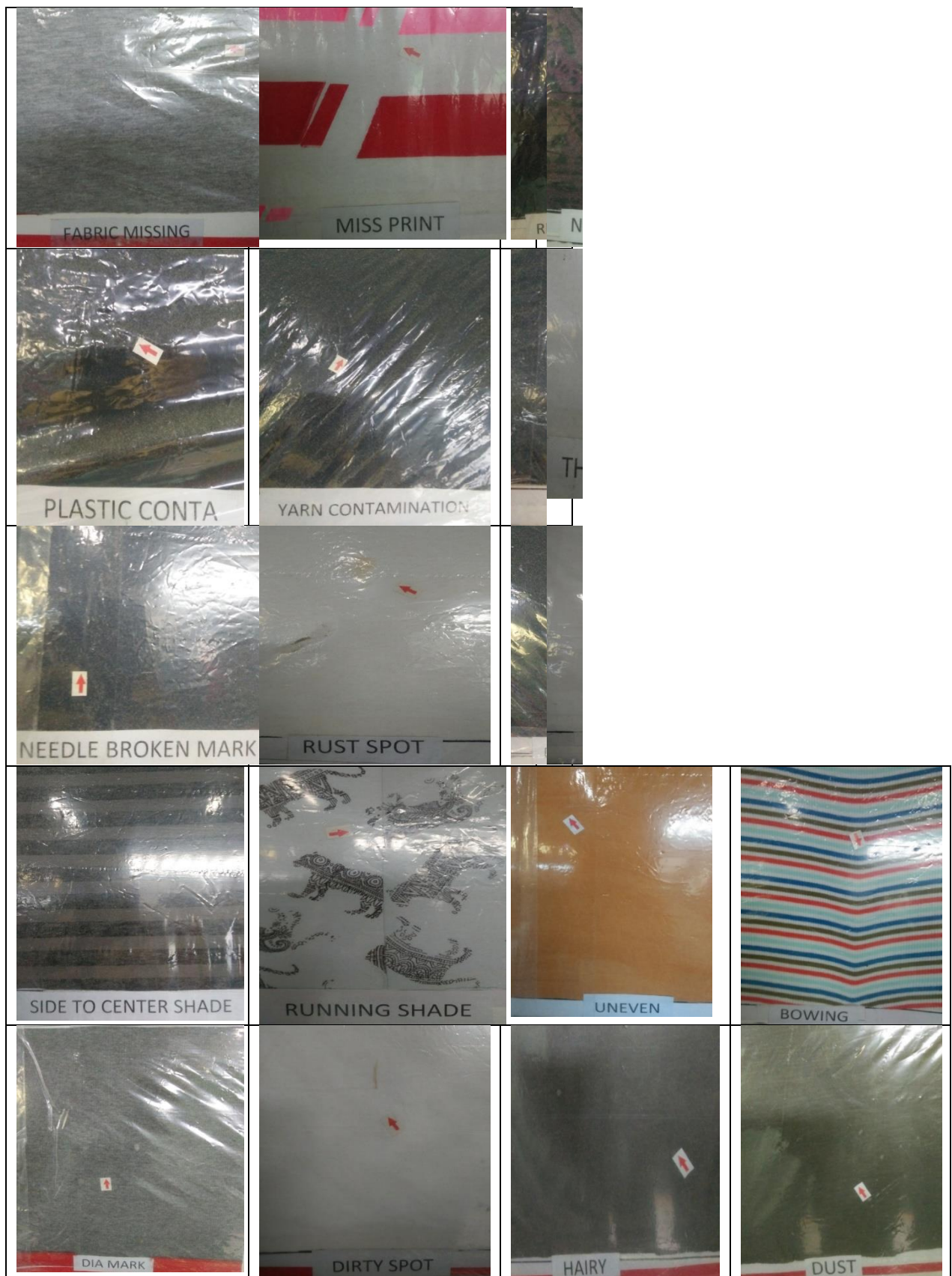
Acceptance Criteria and Calculation:

- 40 points per 100 yards is the acceptable defect rate
- $\# \text{ of points per } 100 \text{ yds} = \# \text{ of penalty points} \times 100$
Yds inspected

Inspection procedure:

- Determine the amount to inspect 10%.
Select the rolls to inspect.
- Put the rolls on the inspection machine or other viewing device.
- Cut off a 6 inch piece across the width off the end of the roll. Mark the right side of the strip. Stop the inspection process every 50 yards and use the strip to check for any shading problems. Also make sure to check the end of the role.
- Inspect for visual defects with the light on at a speed slow enough to find the defects. (The fabric must be checked at a slow rate in order to effectively find flaws). Sometimes you may have to turn the light off to see how a flaw will affect the appearance of a garment.
- Check that the roll contains the correct yardage as stated by the piece goods source.
- Check for skewed, biased and bowed fabric.
- Mark any defects to the side with colored tape so that can be easily found and noted.
- Record any defects.

Picture of Major Defects:



CHAPTER- 5(E)

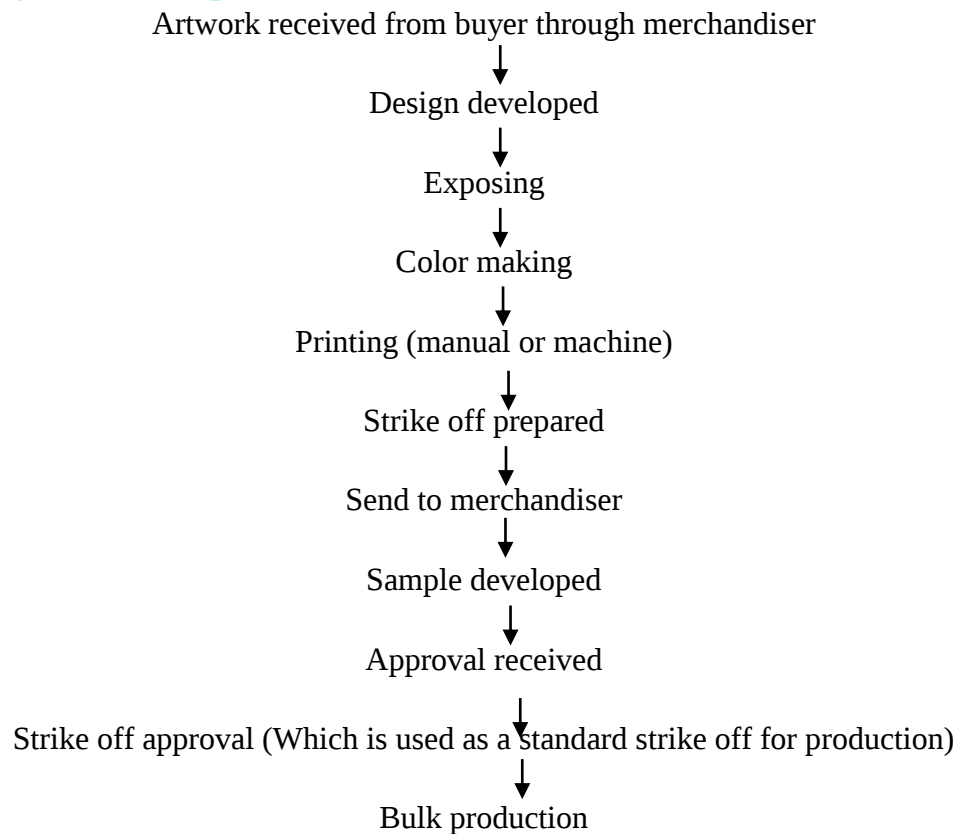
PRINTING DEPARTMENT



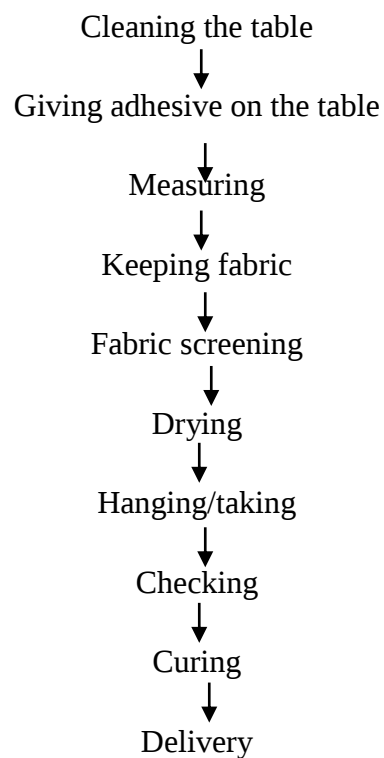
Printing is mainly of two types

1. Oil base printing (plastisol)
2. Water base printing (pigment, rubber, discharge, gel, flock, foil)

Working Process sequence:



Working process of printing for bulk production:



Description of working process:

Cleaning the table: At first water is spreading on the table then it is rubbing pull out dust by craver. Then the table is drayed by hand dryer.

Giving adhesive on the table: When cleaning process is finished, then fiving the adhesive. The adhesive mainly used for the fabric keeping the certain place adhesive is one kind of starch and no color.

Measuring the table: Marking one the by screening. It is measuring the size it screening for printing the specific place.

Keeping the fabric: Keeping the fabric on the table.

Fabric lay: Fabric lay on the table and fabric set on the table by marking.

Screening: When man fabric is laid on the table by marking then screen on the fabric. For pigment printing it give two times.

Drying: When printing is finished then drayed by hand dryer time 30sec.

Taking/Hanging: Fabric take out from the table and hanging by stick, hanging times 30min.

Checking quality: Checking the printed fabric and find defect shade variation staining problem etc.

Curing: When quality checking is finished then sends to curing m/c and set the time temperature for different printing.

Delivery: When all kind of process is finished then the printed fabric send to the sewing section.

Printing type:

1. Pigment printing.
2. Puff printing.
3. Poll printing.
4. Flock printing.
5. Gel printing.
6. Glitter printing.
7. Rubber printing.

8. Discharge printing.
9. Plastisol printing.
10. Foil printing.

Types of Machine:

1. Auto Printing M/C / Flash Curing M/S
2. Auto Printing M/C (Round)
3. Manual Printing (Round)
4. Manual Printing Table
5. Curing M/C
6. Exposure M/C

Chemical used in printing:

DP 4000 rubber clear, DP 4005 rubber white, NTP 988 CS, tubasis Fix 104w, Fufix, RB 2590 White, color (basic red, yellow, blue) etc.

Printing Problem:

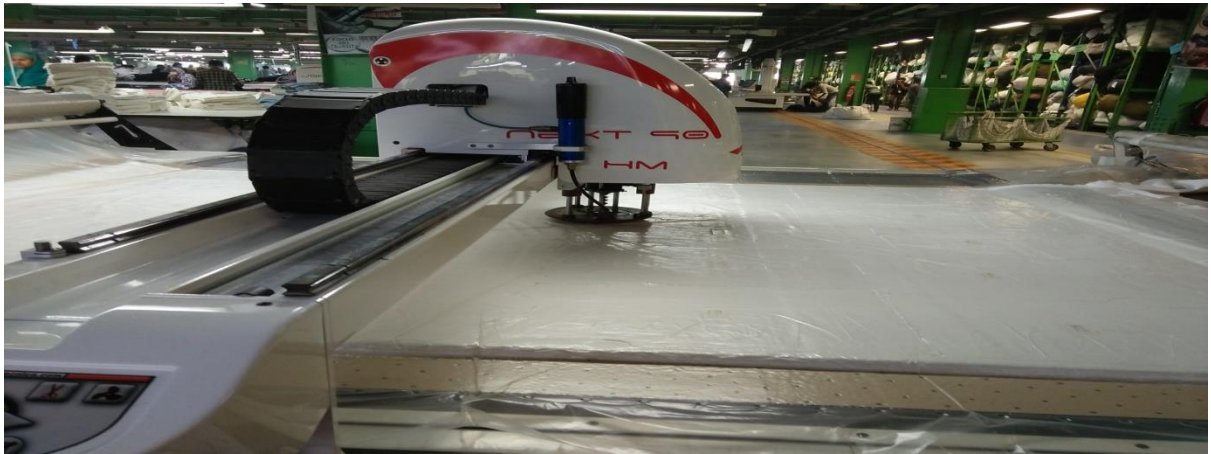
1. Screen set up problem.
2. Shade variations.
3. Foil missing.
4. Flock missing.
5. Uneven printing.
6. High curing temperatures.



Embroidery M/c Of Fakir Fashion Ltd

CHAPTER- 5(F)

CUTTING DEPARTMENT



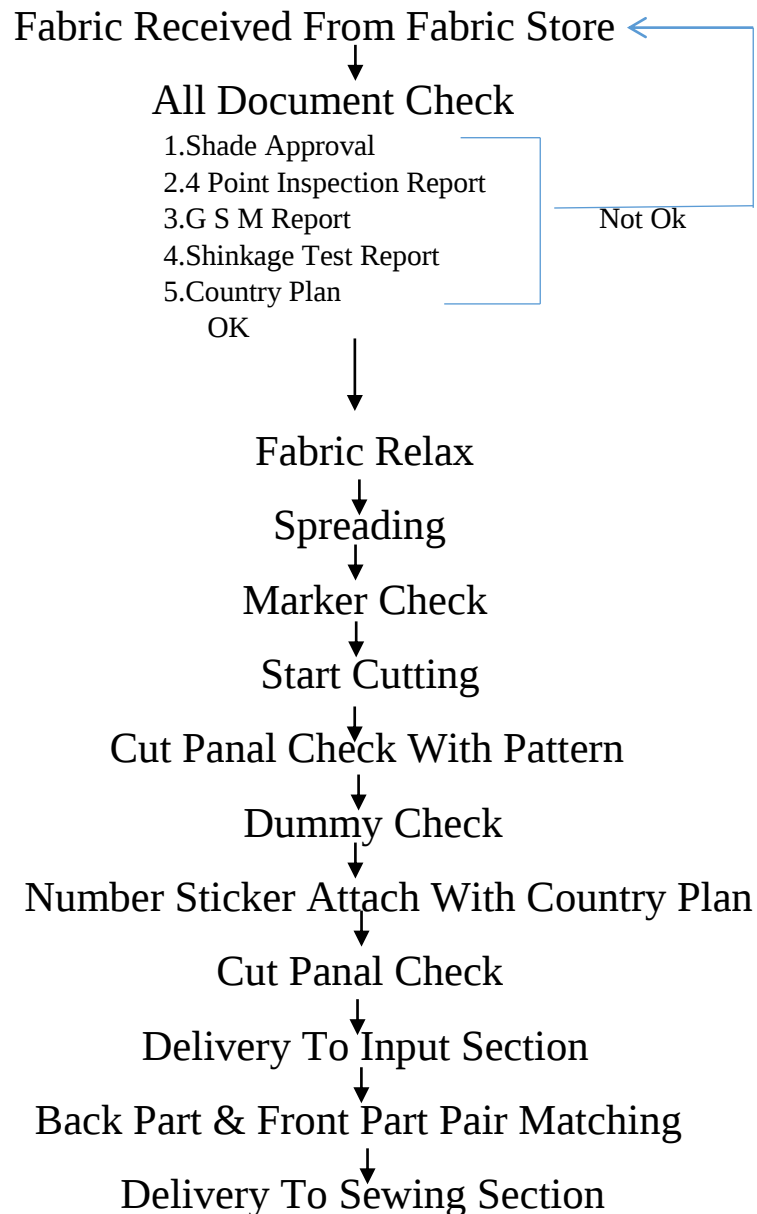
PEQUIREMENTS FOR FABRIC CUTTING

The following points must be fulfilled in fabric cutting:

1. **Precision of fabric cutting:** Fabric cutting should be done accurately as per exact dimension of the pattern pieces in the marker. Accurate cutting depends on methods of cutting and marker planning. If manual cutting method is used, then cutting accuracy depends on sharpness of knife, skill of operator and attentiveness of operator. Computer controlled cutting and die cutting have their self cutting accuracy.
2. **Consistent cutting:** Whatever be the cutting method used for fabric lay cutting, it should be ensured that the shape of the cut components from top to bottom lay are of exact size and shape, otherwise the garments produced will be defective.
3. **Infused edge:** During fabric cutting, the friction between the fabric and the blade produces temperature in the blade; the temperature may be up to 300°C. If the fabric contains synthetic fibers e.g. nylon, polyester, acrylic or their blend, then fused edge may result in the fabric. As because most of those fibers melt at around 250°C. Therefore, sticking of cut fused edge after will increase the fabric wastage. Moreover, the fused edge after cooling will form hard bid, which will be a problem of irritation during use of garments. To avoid the problem of fused edge formation, the following steps may be taken:
 - I. Reduce the height of the lay;
 - II. Reduce the cutting speed;
 - III. Use anti-fusion paper in the lay at regular interval;
 - IV. Lubricate the knife during cutting.
4. **Supporting of the lay:** Surface of the cutting table depends on methods of fabric cutting. The table surface should be capable to support the lay as well as to ensure that all the plies are cut at a time during fabric cutting.

The sequence of the operation in cutting section is as follows

FLOW SEQUENCE OF CUTTING



Store of Garments:

Garments store is the sector where all the raw materials are stored which are need to make a garments. Raw Fabric for cutting, which will be processed to garments by cutting, sewing, is kept here until the process starts. This fabric comes from the main factory after knitting and dyeing. Different types of fabrics like single jersey, Lycia, fleece, rib etc. There are three sections, Fabric store, Garments store, and General

store. In Fabric store all the fabric is being stored. IN Garment is store, all the items without fabrics that are needed to produce garment is stored. Finally, in General store, all the related things that is needed to run a factory is stored.

Fabric Fault Check out before cutting:

This quality control section is very important before garments cutting. The fabric is roughly checked from dyeing section and then those are sending to garments factory for producing complete garments. Usually very small amount of fault comes from dyeing. Small hole and pin hole are the main faults get in cutting quality check. But a single pin hole in single part of garment could be the cause of rejection of garments and it is a major defect. That's why a thoroughly checking of garments and it is a major defect. That's why a before going to relaxation section of cutting. Required number of table is checked. Normally 10% fabric is checked. There are two popular fabric fault checking system is existed. Ten point system and four-point system. Usually four-point system is very much popular for knitted fabric and ten point system is popular for woven fabric.

Relaxation of fabric for cutting

Normally Fabric came in a roll form. Before sending the fabric for cutting, it is necessary to relax the fabric. Usually fabric comes as the form of role or gathered from textile dyeing section. So the dimensional stability of fabric is relatively lower and it contains crease mark. The fabric is kept in an open place for around 12-24 hours according to fabrics type and buyer requirements. Relaxation time for lycra fabric and pique fabric is around 3 days and minimum 24 hours and minimum time is 12 hours. There are racks to store the fabrics for relaxation.

Shade checking before cutting:

Shade checking is most important part in cutting section. Before spreading the fabric on the cutting table, relaxed fabric is rechecked for shade variation in time of relaxation. If the fabric is ok then it goes for cutting. If not, then that part of fabric in the fabric spreading m/c.

The fabric is being gathered in the machine in a small lay form that will be easy to spread the fabric in the fabric cutting table. At least two men are needed to do the job.

Spreading of fabric:

Fabric is spread on the table by spreader machine. One man control the machine and around 6-10 people to adjust the fabric to its specific dimension. Number of layer varies according to the marker length and production needed. More the layer length will be, the more will be more will be the production rate.

Marker attachment

After laying down the specific number on the cutting table the marker paper is overlaid on the fabric. Then the marker paper is attached to the fabric by some adhesive.

Cutting

There are cutting men to cut the laid fabrics according to the marker sketch. Normally two men do this job. Generally 10-15 numbers of laid fabrics are being cut.

Numbering

The fabric pieces are being numbered by a labeling machine to identify these pieces in future.

Bundling

All the numbered fabric is then bundled together and sent for checking.

Panel Check (QC)

Here, the fabric is being checked for any fault. There is a sticker with all the information that is needed to identify this bundle in future for further processing like, Date, Buyer, cutting no., size, serial no. are checked.

After Panel Check

If there is a fault in the fabric then it is sent for further processing. If there is some spot in the fabric then it will be washed and if there is a hole or something that needed to be replaced then it is sent for replacement cutting.

If the garment will be solid then it goes for sewing. But if some fabric pieces need to be printed or embroidered then it goes for it. After returning from printing or embroidery the fabric is ready for sewing.

Checking & Counting (QC)

After doing, the entire job in cutting section the fabric is checked and counted. Then all these pieces go for sewing. Responsible people from sewing department receive the fabric from cutting department.

Sewing

Now, the pieces of fabrics are joined together to make the final product.

Mock up sample:

The sample which is made by batch wise fabric, that is called Mock up sample. This sample is made of only cutting section. Because batch wise fabric quality, is different

than each other. If any batch of fabric shows low shrinkage, other batch of fabric can shows high shrinkage. So, to cut the fabric, it must be know how much allowance is given. After making the sample, it is sending for wash. Then received the washed sample and take the measurement, to know how much allowance is given the marker for cutting the fabric.

Types and Number of m/c:

1. No of auto spreading m/c: 09 (Brand – Morgan)
2. No of auto Cutting m/c: 03 (Brand- Lacra-1,Morgan -2)
3. No of auto stickering m/c: 09 (Brand- Jacker)

QC Manager

CHAPTER- 5(g)

Sewing & Finishing Department



Flat Lock M/C	Plain M/C	Overlock M/C

Working process sequence:

Part assembling as part size, color, number sticker.



Machine lay out plan from input to output as per work study lay out.



Briefing all/every operator as per sample by main in charge.



In production running in sewing line sewing people make some pattern for better production, better quality and better measurement.



Line Q.C. should follow the all operations as per sample if he found any problem immediately stop the machine and call the concern person and correct the operation.



After final output from line sew assistant cut the uncut thread from the garments and complete garments hand over to the end line Q.C. in between whole the operation if only Q.C. found any problem as alter we make the correction from specific machine and operators.



After end line Q.C. check only good garments we pass to finishing color, size and bundle wise.



Sometimes Finishing Q.C. also found some problem. Then they send back the garments to sewing line for correction.

Common Machine of Sewing & Finishing & Packing Department

Sl. No	Machinery	Brand	Origin
1	Rib Cutting M/C	Juki	India
2	Overlock M/C	Pegasus	Japan
3	Flatlock M/C	Pegasus	Japan
4	Plain M/C	Juki	India
5	Button- Eyelet Hole/Attaching M/C	Juki	India
6	Bartack M/C	Juki	India
7	Smocking M/C	Juki	India
8	Kansain M/C	Juki	India
9	Zig-Zug M/C	Juki	India
10	Ironing M/C	Juki	India
11	Metal Detector M/C	Morgan	Italy
12	Pocket Attaching & Sewing M/c	Pegasus	Japan

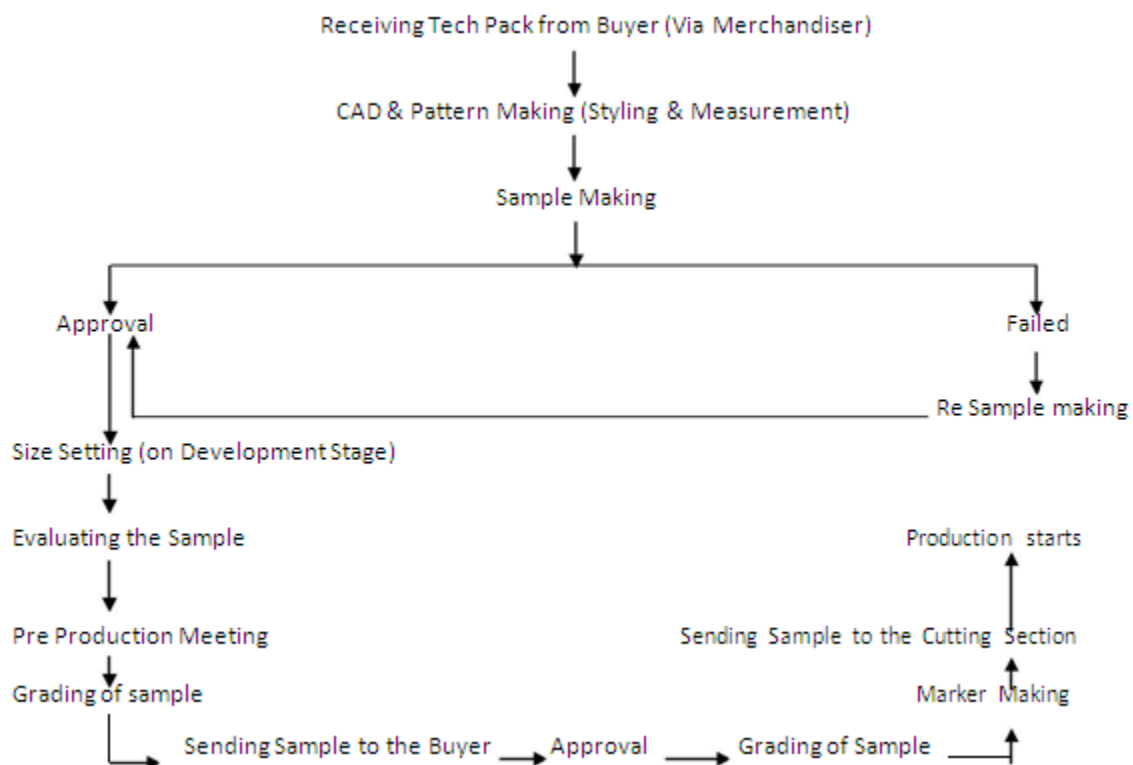
Sample:

Sample is the prototype or model of the garment, upon what the buyer can decide on how and whether to confirm the order or not.

There are mainly eight types of sample needed for completing a garment order. Those are-

1. Proto sample,
2. Fit sample,
3. Size set sample,
4. Counter sample,
5. Salesman sample (SMS),
6. Pre-production sample (PPS),
7. Top over production sample (TOP),
8. Shipment sample.

Sampling Process Flow Chart:



SMV

SMV is **defined** as the time which is allowed to perform a job satisfactorily. Normally it is expressed in minute value. The full elaboration of **SMV** is **Standard Minute Value**. **SMV** term is broadly used in the garments manufacturing industry. **SMV** is also known as Standard Allocated Minute (SAM)

SMV = (Basic minute + Bundle allowances + Machine and Personal allowances)..... (1)

Sewing of Basic T-Shirt:

1. **Overlock M/C:** Shoulder Join, Neck Join, Sleeve Join, Side Seam
2. **Flat Lock M/C:** Sleeve Hem, Body hem, Neck top stitch
3. **Plain M/C:** Back neck top, Label attach, Neck tuck, Rib tuck.

Line Balancing

Line Balancing is leveling the workload across all processes in a cell or value stream to remove bottlenecks and excess capacity. A constraint slows the process down and results in waiting for downstream operations and excess capacity results in waiting and absorption of fixed costs.



Line Balancing in apparel industry

It is the allocation of sewing machine, according to style and design of the garments. It depends on what types of garments we have to produce. It is done to increase productivity.

When you consider mass production, garments are produced in lines or set of machines instead of single machine. A line may be assembly line, modular line or section, a line set with online finishing and packing. A line includes multiple work stations with varied work contents. Production per hour is varied depending on work content (standard minutes of particular task/operation), allocation of total manpower to a particular operation, operator skill level and machine capacity. Operation with lowest production per hour is called as bottleneck operation for that line.

Objectives of Line Balancing

Match the production rate after all wastes have been removed to the talk time at each process of the value stream.

1. Regular material flow.
2. Maximum uses of man power and machine capacity.
3. Minimum process time.
4. Minimizing slack time.
5. Minimizing workstation.
6. Maximum output at the desired time.
7. Quality maintenance of the garment.
8. Reduce production cost.

Importance of Line Balancing

1. Line balancing helps to know about new machine required for new style.
2. It becomes easier to distribute particular job to each operator.
3. It becomes possible to deliver goods at right time at the agreed quality for list cost.
4. Good line balancing increase the rate of production.
5. Line balancing helps to compare the required machinery with the existing one and compare balance.
6. It also helps in the determination of labor requirement.
7. Good balancing reduces production time.
8. Profit of a factory can be ensured by proper line balancing.
9. Proper line balancing ensured optimum production at the agreed quality.
10. It reduces faults in the finished product.

Example of Line Balancing

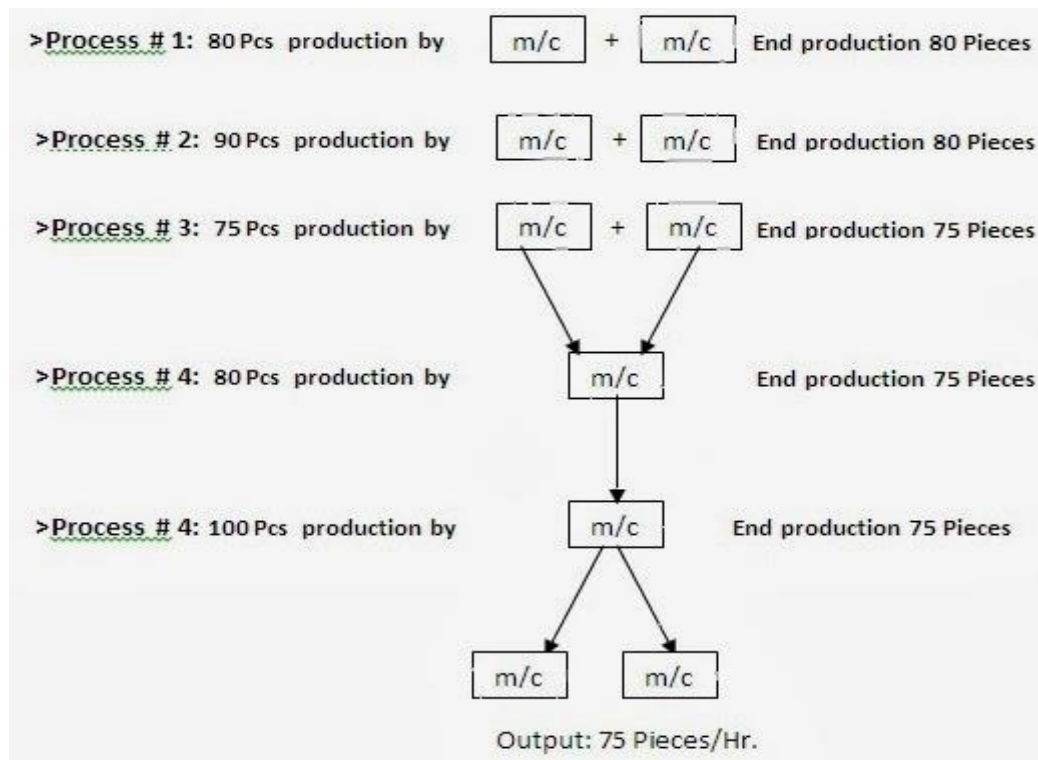
1. Machine layout with actual production.

- >Process#1. Production 40 pieces by 1 machine end production 40 pieces.
- >Process#2. Production 45 pieces by 1 machine end production 40 pieces.
- >Process#3. Production 75 pieces by 1 machine end production 40 pieces.
- >Process#4. Production 80 pieces by 1 machine end production 40 pieces.
- >Process#5. Production 50 pieces by 1 machine end production 40 pieces.

Output: 40pieces/hour.

Analysis: Insufficient production due to lack of supply.

2. Machine layout for balancing production.



Analysis: Action plan for further development.

Replace skilled or experienced operator for process#3, then production will increase, when production will be 80pieces/hour. Then same target 90pieces for process1, 3 & 4 and research on it, how production can be increased. The following action can be done.

Limitations of Line Balancing

1. Production lines were designed so that conveyor belts paced the speed of the employees' work. This arrangement wasn't appreciated by the employees.
2. Inevitable changes lead to production lines being out of balance.
3. Rebalancing causes disruptions to production

Introduction to Work-Study

Work study is the systematic examination of the method of carrying activities, so as to input the effective use of resources and to setup standards and performance for the activities being carried out. Management frequently calls on specialist to assist it in improving productivity. One of the most powerful tools they can use is that of Work-Study.

When management calls on work -study to improve productivity then they aim at:

1. Examining the way an activity is being carried out.
2. Simplifying or modifying the method.
3. Reduce unnecessary or excess work.
4. Wasteful use of resources
5. Setting up a time standard for performing that activity.

Objectives of Work Study:

1. Lower cost.
2. Increase productivity.
3. Increase profitability.
4. Increase job security.
5. To make the work easier.
6. Establish fair task for everyone.
7. Check achievements against standard.

History of Work-study in Bangladesh

Mr. F W Taylor who is called the father of scientific management is the founder of work-study. During the Second World War USA needed so many arms within a short time. Then Mr. F W Taylor applied Work-Study method to make many arms in short time & go tremendous result. After that work-study is being used in everywhere. Now it's circumference is getting larger day by day.

Mr. Keith Harding form England started Work-Study in Bangladesh (Young one Corporation) in 1991. Now it is contributing very well to increase the productivity in Bangladesh.

Work Study & The management

- Work-study definition
- Techniques of work-study
- Basic procedure of work-study
- Characterics of work-study
- Method study
- Motions
- Work measurement
- Time study
- Critical examination technique

PRIMARY & SECONDARY QUESTIONING

- Select where to start
- Productivity
- The task of management
- Basic & total time
- Poor design & specification

- Inefficient methods
- Human resource
- Reduction of excess
- The qualified worker

PRE-PRODUCTION ACTIVITY

- Size set sample making
- Pre-production meeting
- Break down
- Layout
- Machine & work process flow chart

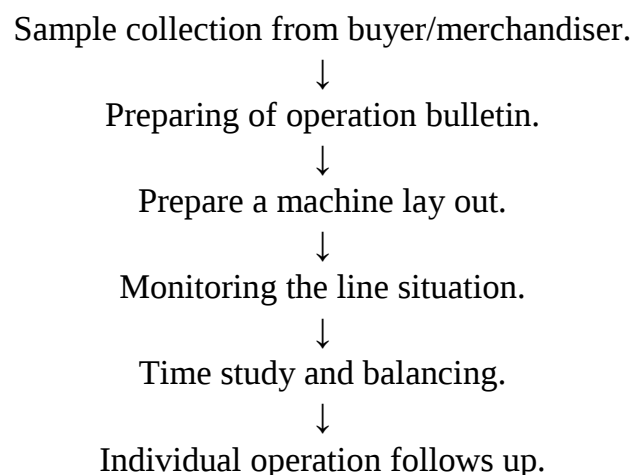
PRODUCTION FOLLOW UP

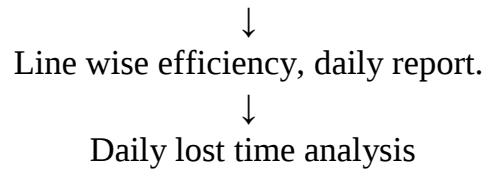
- Cycle check
- Bottle neck
- Line balancing
- Production study
- Method study

Benefit of Work Study

1. It increases productivity at cheap cost.
2. It is a systematic and comprehensive method of analyzing a problem. So low factor is overlook in evaluating the problem and finding out the solution.
3. It can be easily and quickly implemented.
4. It provokes benefit as soon as it is applied and continuous till it is in use.
5. It can reduce hazard by developing made of work.
6. It is the most accurate method of setting time of performance upon which effective planning and production control relies upon.
7. Production quota can be determined for daily or hourly workers.
8. Production capacity of a mill or machine can be determined.

Flowchart of Working Process:



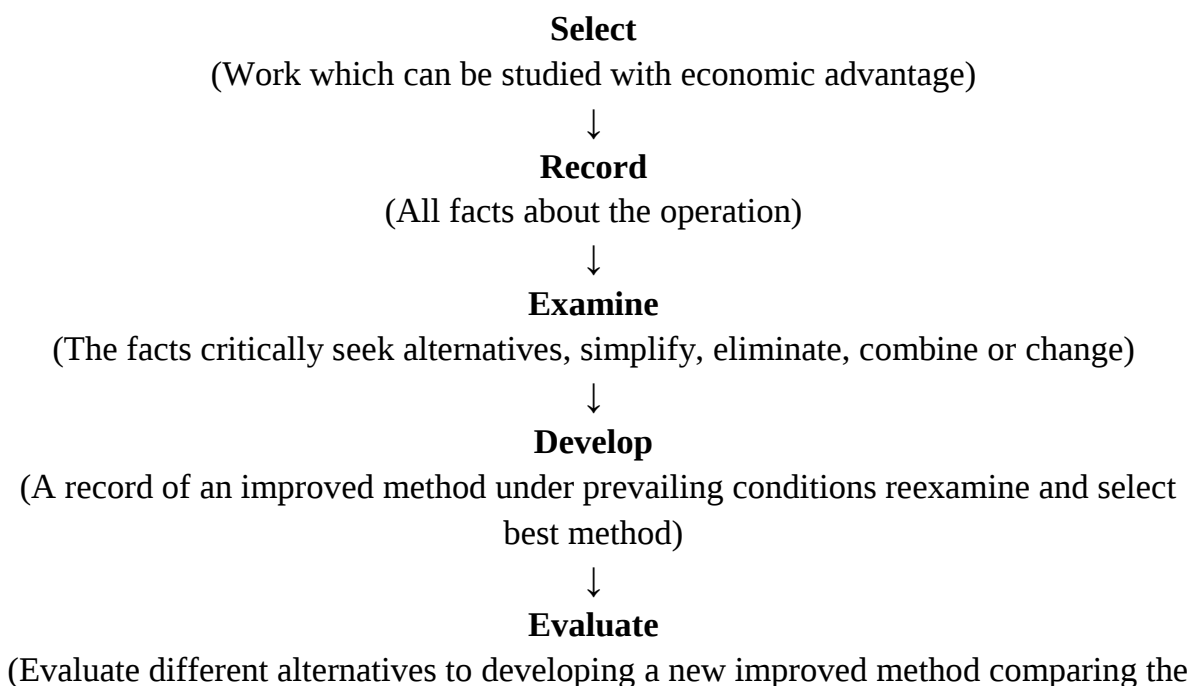


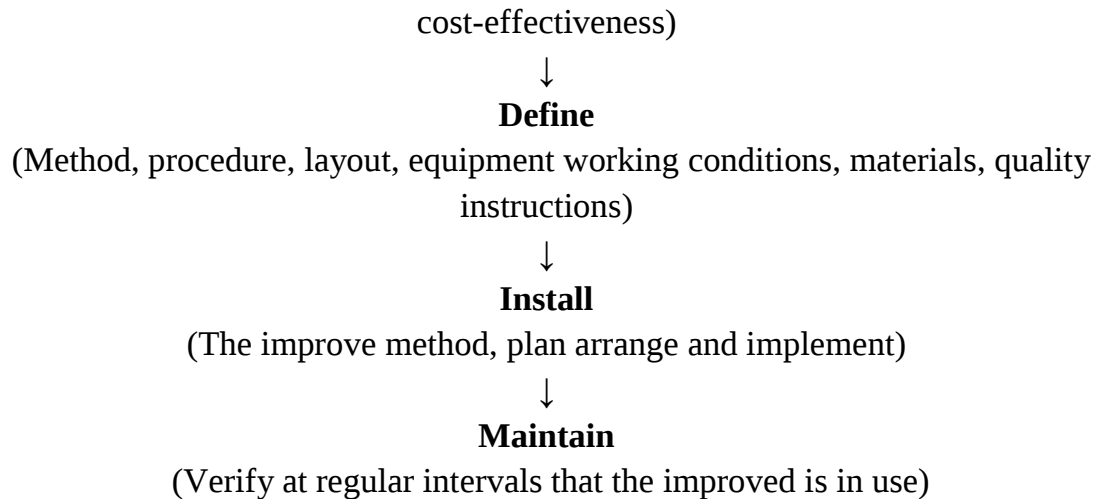
Method Study:

Method study is more of a systematic approach to job design than a set of techniques. It is defined as the systematic recording and critical examination of existing and proposed methods of doing work. Method study is also known as methods engineering. It is one of the keys to achieving productivity improvement in garment industry. Method study is essentially used for finding better ways of doing work. It is also a technique for cost reduction in garments manufacturing.

Method Study in Garment Industry

Flow Chart of Method Study in Garment Industry





Calculation of Garments Production:

There are some points which must be needed during calculation of garments production,. Those are-

1. Standard allowed minutes (SAM),
2. Number of operators- working in a line,
3. Number of hours running-production line work in a day,
4. Average line efficiency,
5. Total break time including Launch, Tea and Others.

During calculation of garments production, we have to follow a formula, that is-
Per day production (pc),

$$\text{Total man-minutes needed in a day} = \frac{\text{Standard allowed minutes (SAM)}}{\text{Average line efficiency}} \quad (1)$$

Here, total man-minutes mean number of operators working in a day including total break time for Launch, Tea and Others.

Or,

$$\text{Total man-minutes} = [\text{Total Number of operator's} \times \{(\text{Working hour in a day} \times 60\text{minutes}) - \text{Total break time}\}]$$

Now, we can write equation (1) in the following way-
Per day production (Pc),

$$= \frac{[\text{Total No. of operator's} \times \{(\text{Working hour in a day} \times 60\text{min}) - \text{Total break time}\}]}{\text{Standard allowed minutes (SAM)}} \times \text{Avg. line efficiency} \quad (2)$$

So, it is the main formula for estimation/calculation of garments production.

Different types of sewing problem in sewing section:

- i. Missing stitch.
- ii. Broken Stitch.
- iii. Wrong stitch length.
- iv. Not properly sealed.
- v. Stitch density wrong.
- vi. Wrong tension.
- vii. Skipped stitches.
- viii. Twisted seam.
- ix. Puckered seam.
- x. Stretched our seam.
- xi. Not straight seam.
- xii. Unbalanced/uneven seam.
- xiii. Seam missing.
- xiv. Cracked seam.
- xv. Tapping is missing.
- xvi. Checks and stripes are not matching.
- xvii. Piping uneven.
- xviii. Piping puckered.
- xix. Bar tack at wrong position.
- xx. Bar tack at missing.
- xxi. Wrongly Positioned.
- xxii. Wrongly attachment (pocket, flap, yokes, vents)
- xxiii. Fabric defects Etc.

Chapter – 5 (h)

Washing section



Washing

We are living in the fashionable era. Everyone wants to wear a fashionable garments. As a result the people can make the difference with others. A basic knitted T-Shirt and washed knitted T-Shirt is totally difference to look. At present, knitted washed item is a hot-cake for the young generation.

Fakir Fashion Ltd Dohargaon, Ruppong, Narayangang. SECTION: WASHING PLANT	
Sl No	Particulars
1	Normal Garment Wash
2	Garment Softner Wash
3	Garment Silicon Wash
4	Garment Acid Wash
5	Garment Sand Wash
6	Garment Salt Wash
7	Garment Stone/rubber ball Wash
8	Garment Enzyme Wash
9	Garment Snow Wash
10	Garment Dry-Fill Wash
11	Garment Acid Hand Brush
12	Garment Acid Spot Wash
13	Garment Heavy Wash
14	Garment Treated with bleach or permanganate
15	Garment bleach with chlorine
16	Garment to prevent cracking
17	Garment crinkle Wash
18	Garment crinkle Acid Wash
19	Grinding & Heavy Garment Wash
20	Grinding & stone/rubber ball Wash
21	Garment over dyeing
22	Garment cool/wave dyeing
23	Garment dischargeable dyeing
24	Pigment dyeing (Normal color)
25	Pigment dyeing (Neon color)
26	Tie & dye single color (reactive)
27	Tie Acid Wash
28	100% Denim Wash
29	Fabric/garment Scouring
30	Garment dip dyeing (reactive)
31	Garment old vintage dye
32	Garment natural vegetable dye
33	Garment wet looks
34	Garment shiny looks
35	Garment mica finish
36	Garment metalic coating effects
37	Garment pearlescent effects
38	Garment cool pigments/spray
39	Garment moch romic(Heate sencitive) dye
40	Burnout wash
41	Normal Wash with softner
42	Normal wash
43	Hydro
44	Tumble dryer
45	Fabric Wash & Hydro-tumble
46	Garment tumble dry/steam tumble
47	Hand Whisker
48	Hand Scraping
49	P.P Spray
50	Tagging
51	Granding

Some washing processes:

1. Enzyme Wash: The wash in which enzyme is used called enzyme wash. This enzyme may be neutral or acid depends on the requirement of shed. In this wash, enzyme is used for producing different types of abrasion for the garments. As a result, the garments are looking very nice to see. The main target of enzyme wash is to change the outlook of any knit garments. Enzyme washed hooded fleece jacket Enzyme washed hooded fleece jacket

2. Stone Enzyme Wash or Heavy enzyme wash: In this wash, enzyme and stone are used together for producing heavy abrasion for the garments. Here, the wash technician should have taken some precaution to avoid the damage of the garments. For avoiding this case, its prefer to be used the very small stone. The main target of this wash is to produce heavy abrasion on knit garments. Stone washed t-shirt Stone washed t-shirt

3. Rubber Ball Wash: Rubber ball wash is nothing but a garments and softener wash. In this process, garments will more soft and at a time seam abrasion will come. When any knit garments needed more hand-fell with seam abrasion that time we will use this process. Rubber ball washed Rubber ball washed

4. Hot Wash: Normally in knit fabrics, hot wash is used to prevent the shrinkage problem after completing different treatment of that garments. Hot wash should be done before making any garments. It's should be noted that, When a garment have any treatment such as- Garment dye, Cold dye, P.P spray etc. then it's a mandatory process to complete fabrics hot wash before making of that garment. Otherwise, it will create problems during measurement.

5. Softener Silicon Wash: When any knit garments needed more hand-fell and softness in the same occasion, in that case, this wash will be used. For this wash, softener and silicon both will be used together where silicon will be used for softening the cellulose and silicon for surface slipper. The softener may be cationic or nonionic. Softener silicon washed jumper Softener silicon washed jumper

6. Acid Wash: The main target of this wash is to produce uneven look on knit garments. Acid wash is done by potash and stone. At first, we have to dip the stone in potash solution then slight dry the stone and wash in a washing machine. After all we will get an uneven look on garments. Acid washed t-shirt Acid washed t-shirt

7. P.P Spray: P.P Spray means potassium permanganate spray on the specific area of a garment. This chemical is used to reduce the color from the knit garments. At first, knit garments have to take by two person in two sides, then this chemical will be applied with the help of P.P gun by air pressure. This spray is done on the scrapping area and after neutralize by sodium meta-bi-sulphite chemical in washing machine, a white look on the spray area will be achieved.

8. Garment Dye: Garment dye process is done all time after making the garments. Traditional garments are made from fabric that is pre dyed. Garment dye can be pigment dye or cold dye which is totally depends on

9. Washing Process of Pigment Wash:

The pigment washing process of batch of 80 kg Twill/canvas Garments are described below:

First Step:

1. Lot size: -..... 80 kg Twill/Canvas Garment.
2. Add water @ L: R = 1: 8..... 640 Litre
3. Machine Running.
4. Add Caustic soda (NaOH)..... @ 0.8 gm / liter 512 gm.
5. Add Soda Ash (Na₂CO₃)@ 1.50 gm / litre..... 960 gm.
6. Add Detergent @ 0.8 gm / litre 512 gm.
7. Temperature..... 50°C to 60°C.
8. Time (Depend upon the shade) 20 to 60 mts.
9. Drop the liquor.
10. Wash 1 time by hot wash for 5 mts at the temperature 50°C.
11. Wash 1 time by cold water for 5 mts

Second Step :

1. Add water @ L : R = 1: 6 480 litre.
2. Washing machine running
3. Add Acetic Acid (for pH 4.5 -5.5) @ 0.5 gm / litre 240 gm.
4. Add Flax softner @ 0.6 gm / liter..... 288 gm.
5. For more slippery hand feel use silicon -@ 0.4 gm / litre.....192gm.
6. Time..... 15 to 25 mts.
7. Drop the liquor.
8. Unload the Garments on trolley.

Third Step: Hydro Extractor Machine.

Hydroextraction the garment to remove excess water from the Garment. Time required about 2 -4 minutes.

Fourth Step: Steam Dryer / Gas Dryer.

1. Load on steam dryer -50 kg
2. Running the machine
3. Temperature -60°C -70°C
4. Time -40 -50 mts for dry.
5. Time -10 -15 mts for cold dry.

or

1. Load on gas dryer -50 kg,
2. Running the machine
3. Temperature: -70°C -85°C for dry.
4. Time: -30 -35 mts for dry.
5. Time: -10 -15 mts for cold dry.

Pigment dyeing process:

1. Cationisation of the Fabric

Or giving electric charge to the fabric by a powerful cationic pretreatment.

Pigment dyeing is an electrical process whereby the goods to be dyed are given an electrical charge opposite that of the pigment. When the pigment is added to the bath, the opposite electrical charges attract each other, much like the north and the south poles of two magnets. Because of the electrical nature of the process.

A typical recipe for cationizing Step

- Cationic Imparting Agent
- Wetter
- Acetic Acid for pH control

The cationic agent is applied with a wetting agent and acetic acid onto the fabric in the batch or commercial dyeing machine. After a period of time, the fabric is rinsed.

2. Pigment Exhaustion on the Fabric

The pigments are first mixed with water and a dispersing agent that imparts an anionic charge to the pigments. This solution is added gradually to the dyeing machine. The temperature of the bath is slowly increased and the machine is held at the dyeing temperature for up to 20 minutes. The fabric is held at an elevated temperature to increase the adsorption of the pigments.

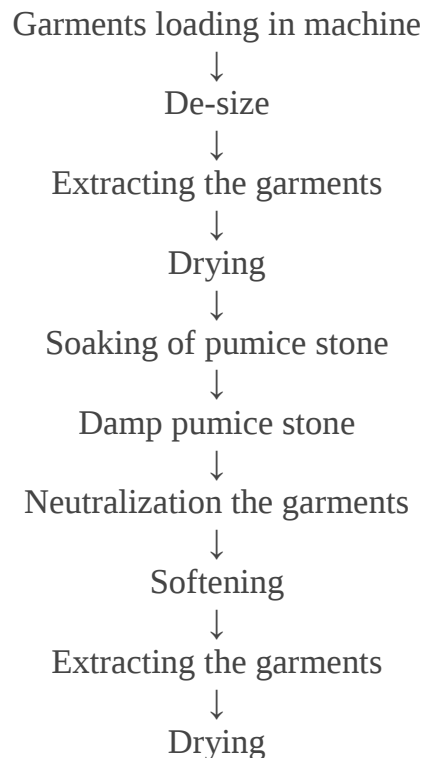
A typical recipe for this step

- Pigment colorants
- Dispersing agent

3. Binder Application

A binder used in the exhaust pigment dyeing procedure for fixing pigment colors. Binders are commonly acrylic polymers with nonionic and cationic nature. It improves crock and wash fastness. After the pigment is exhausted, the binder is fed into the dyeing machine and exhausted onto the fabric over a period of time. Acetic acid is added to the bath, which facilitates binder polymerization, then the fabric is rinsed, the dyeing machine is drained, and the fabric is extracted.

Process Flow Chart of Acid Wash:



All the above processes are discussed in the following:

1. Garments loading in machine:

It is the first process of acid wash. Required amount of garments are loaded in the machine here for de-sizing the garments.

2. De-size:

The garments are de-sized here by using detergent and de-sizing agent. Required amount of de-sizing agent should be applied here by following M: L ratio. Here, sometimes needed 50-60° C temperature depends on the shade. De-size should be done at least 15-20minutes.

3. Extracting the garments:

After completing de-sizing process, the garments are squeezed here by using hydro-extractor machine and send to the drying section.

4. Drying:

Here the extracted garments are dried by using gas dryer or steam dryer depending on the shade. It should be noted here that, gas dryer is used for reddish shade and steam dryer is used for bluish shade.

5. Soaking of pumice stone:

The fresh pumice stones are soaked here at room temperature for 10minutes by shuffling using Potassium permanganate (KMnO₄) and Phosphoric acid (H₃PO₄) containing the liquor ratio 1:2. Pumice stones are naturally perforated and should pick up the solution very quickly.

6. Damp pumice stone:

After the required soaking of pumice stone, the completely dried de-sized garments

are treated in the machine with damp pumice stones at room temperature for 15 minutes (depending on the shade). After completing this process, garments are unloaded from the machine and loaded in another washing machine for neutralized the garments.

7. Neutralization the garments:

After completing damp pumice stone process, the garments must be neutralized here by using Sodium meta-bisulphite ($\text{Na}_2\text{S}_2\text{O}_3$) containing the liquor ratio (M: L) for 5 minutes (depending on the shade).

8. Softening:

Here the garments are producing too soft effect by using softening chemical containing liquor ratio (M: L). After completing this process, garments are unloaded from the machine.

9. Extracting the garments:

Here the acid washed garments are extracted and send to the drying section.

10. Drying:

Finally the garments are drying here by using gas dryer or steam dryer depending on the shade.

Silicon wash process:

Silicon washes generally doing on all type of fabrics i.e. Twill, Denim, Canvas, Knit, Corduroy. Silicon wash is required for the following reasons:- It gives durable softness, elastic handle, It helps to antipilling affects, dimensional stability, tear resistance. It helps to fabrics to be cut and sewn more easily allows and improving wears and easy care properties. Silicon washed T-shirt Process of Silicon Wash: The silicon washing process of batch of 60 kg Twill/Canvas/Poplin/Corduroy/Trouser is described below:-

First Step:

Desizing Lot weight (Approx 125 pes) 60 kg.

Add water @ L: R = 1: 10..... 600 Litre Machine Running.

Add Desizing agent @ 0.6 gm / litre 360 gm.

Add Detergent @ 0.5 gm / litre..... 300 gm.

Temperature..... 50°C. Time.....10-20 mts. Drop the liquor. Rinse one time 3 minutes.

Second Step :

Softening Add water @ L : R = 1 : 8 480 Litres.

Add Acetic Acid @ 0.6 gm / litre 288 gm. Cationic Softner @ 1 gm / litre..... 480 gm. Silicon (ME) @ 0.5 gm / litre 240 gm.

Temperature..... 40°C.. Time..... 15 to 20 mts.

Drain the bath.

Then unload the garments on trolley.

Third Step: Hydroextractor Machine After unloading garments from the washing machine then they are sent to hydroextractor machine to remove excess water from the washed garments.

Fourth Step: Drying Machine Load 60 kg garments to gas/steam dryer. Temperature set -75°C to 85°C. Run about 35 to 45 mts. After run 10 to 15 minutes for cold dryer.

Fifth Step: Drying After dryer garment go to quality section for quality checking and then delivery.

Number Of Machine

Total M/C : Bulk-64

Sample-14

1.No Of Acid Wash m/c: 09

2.No Of Dyeing m/c: 10

3.No Of Hydro m/c: 07

4.No Of Dry m/c: 03

5.No Of Spray Booth: 08

6. 3D m/c: 01

7.Brushing m/c: 05

Chapter -6

Effluent treatment plant

(Chemical & Biological)

Effluent Treatment Plant (ETP) Chemical & Biological & its necessity for mills or factory.

Most of the Buyer consider one of the most critical aspect of environmental management is for all effluent to be treated in a fully functional effluent treatment plant (ETP) before being discharged. Most buyer will not do business with mills that discharge untreated effluent directly into water courses.

EFFLUENT

Minimum Standards Requirement
Untreated effluent must never be discharged
All effluent must be treated in a fully functional effluent treatment plant (ETP) before being discharged
The capacity of on-site effluent treatment plants must be sufficient to process the total factory effluent output
Chemicals must not be allowed to contaminate soil
No chemicals can be washed down surface water drains
Confirm no breaches of consent limits in past 12 months
Confirm no prosecutions in the past 12 months
Mills must be fully compliant with local and national laws and standards
Mills must measure the following parameters: COD/BOD, pH, Temperature, Offensive colour, Suspended solids, Total Dissolved Solids, Specific metals and toxins.
Treated effluent must be tested on a frequent basis in an independent laboratory and records must be available for inspection.
Records of independent test results of effluent must be retained for at least 12 months

Effluent from textile colouration is viewed as the biggest source of pollution and environmental damage in the supply chain when it is not correctly managed. The Buyer policy with regards to effluent control have been in place for many years and are designed to ensure that any mills supplying Buyer comply with the local and national laws as an absolute minimum. Buyer will not do business with any mill which discharges untreated effluent directly or indirectly into water courses (including rivers, lakes, ground water etc).

All effluent must be treated in a fully functional effluent treatment plant (ETP) before being discharged. Effluent can be treated on-site, in a communal plant or in a municipal ETP. However, the factory must clearly demonstrate how and where their effluent is being treated. If a factory is using off-site ETPs, the factory is responsible for ensuring the ETP is compliant with local, national and Buyer requirements.

Buyer do not publish one global standard for effluent treatment. However, the

minimum requirement for any factory supplying Buyer is that they are fully compliant with their local and national laws and standards. As a minimum standard it is expected that factories take action to ensure the

following effluent parameters are measured and controlled.

Parameter	What it is?	Where is it found?	How to reduce the impact
COD / BOD (Chemical / Biological Oxygen demand)	Chemicals which require oxygen to break them down. High content results in depletion of oxygen from natural water courses.	All chemicals and dyes contribute to BOD/COD. Waxes and oils removed from natural fibres and fats removed from hides have high impact.	Minimise chemical usage and select low COD/BOD alternatives where possible.
pH	Excessive acidity or alkalinity that can affect the natural balance within water courses.	Processes that use extremes of pH e.g. acidity from wool dyeing, alkalinity from reactive dyeing.	Effluent must be balanced and neutralised unless there is consent.
Temperature	Releasing excessively hot or cold effluent into natural water courses can adversely affect eco-systems.	Chillers and heating systems. Any process using or creating hot or cold water,	Temperature must be balanced – discharging boiling water or cold water is not acceptable
Offensive Colour	Colour is mainly a cosmetic problem but excessive colour can reduce the amount of light that gets to plant life – and some dyes are toxic to aquatic life	Unfixed dyes	Use higher fixation dyes and use effective colour removal in effluent treatment.
TSS (Total Suspended Solids)	Solid insoluble debris that can be ingested by aquatic species or settle as silt on river or lake beds.	Loose fibre and pumice dust	Improve dust extraction in factory processing (e.g. vacuum slots) use effective filtration as the first stage of effluent treatment
TDS (Total Dissolved Solids)	TDS is a measure of the amount of salts dissolved in effluent. This can kill many forms of life that can only survive in fresh water and have a severe impact on drinking water.	Salt from reactive dyeing.	Optimise dye methods to reduce salt consumption. Reverse osmosis is the only effective means of reducing TDS in effluent.
Specific metals and toxins	Toxins can kill wild-life and seriously affect drinking water supplies	Various contaminated textile dyes and chemicals. Mothproofing, anti-microbials	Screen dyes and chemicals for contamination. Apply known toxins from zero discharge closed loop systems

Where policing and certification of effluent controls is not implemented by local or national authorities, Buyer require mills to have their treated effluent tested on a frequent basis (preferable monthly) in an independent laboratory and records must be available for inspection.

Effluent must not be placed down surface water drains as this may bypass the ETP or contaminate the local soil or groundwater. It is not uncommon for operatives who are cleaning old chemical drums and containers to wash chemical residues down surface drains. This example of bad practice can lead to environmental hazards and put the factory in risk of prosecution and loss of Buyer business.

It is recommended that factories should ensure the total capacity and rates of effluent treatment of the ETP are in excess, or at least matching, the total discharge and rate of

effluent production of the mill. If the rate of production of effluent is approaching the limit of the ETP capacity then action is required to either reduce the demand on the ETP or make investment to expand its capacity.

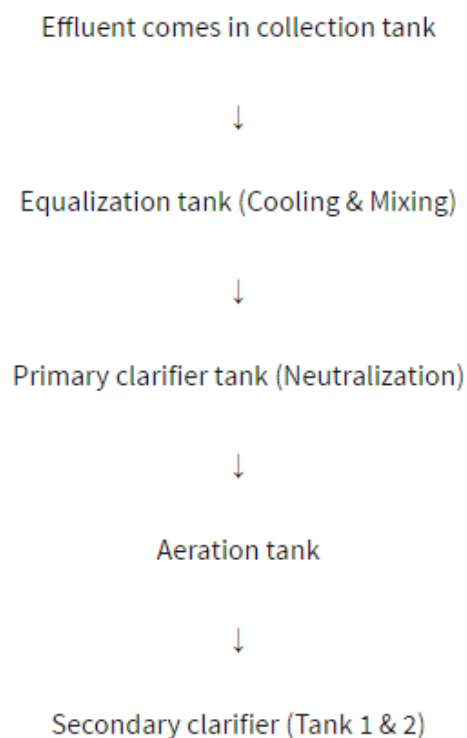
In Bangladesh; a lots of dyeing and textile industries established for processing textile products. To protect the environment from the harmful effect of the waste water the Department of Environment, Government of Bangladesh fixed the following parameters for the waste water which will discharge in the environment after treatment.

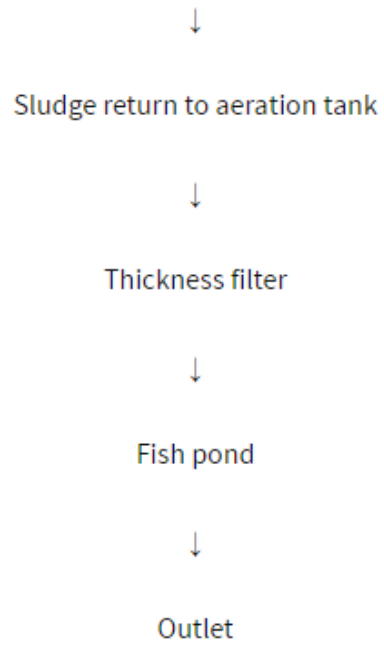
- $\text{pH} = 6-9$
- $\text{BOD} = 50 \text{ mg/L}$
- $\text{COD} = 200 \text{ mg/L}$
- $\text{Suspended solid} = 150 \text{ mg/L}$
- $\text{Color} = \text{Light brownish.}$

The waste water which is produced in dyeing industry its characteristics may be as follow:

- $\text{pH} = 9-11.$
- $\text{BOD} = 300 \text{ mg/l}$
- $\text{COD} = 300 \text{ mg/l}$
- $\text{Color} = \text{Light brownish}$

Process flow chart of biological waste water treatment plant:





So, that's all about the effluent treatment plant. If you have better idea lets me know about it.

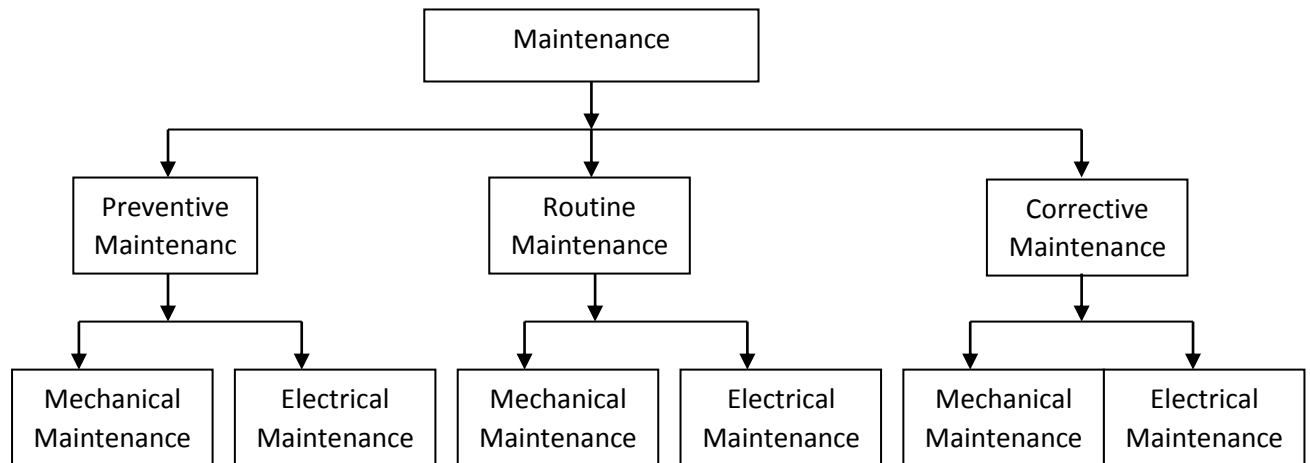


CHAPTER- 07

MAINTENANCE

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

Maintenance of Machinery:



Preventive Maintenance:

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

Routine Maintenance:

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

Corrective Maintenance:

Corrective Maintenance is done after a failure has been occurred.

Maintenance Procedure:

As a part of maintenance normally Esquire knit Composite Ltd. follows preventive maintenance. During maintenance procedure following points has to be checked.

Maintenance : Mechanical
Machine : Dyeing Machine

S/I No.	Items need to be checked and serviced
1	Grease the machine bearing.
2	Complete cleaning of machine.
3	Cleaning of drain valves, replace seals if required.
4	Check air supply filters, regulators, auto drain seals.
5	Greasing of unloading roller bearings.
6	Checking of oil level and bolts of unloading gear box.
7	Checking of unloading roller coupling and packing.
8	Checking and cleaning of main vessel level indicator (if required).
9	Checking of all belts and belt tensions.
10	Check all door seals.

Maintenance : Electrical
Machine : Dyeing Machine

S/I No.	Items need to be checked and serviced
1	Check all motor terminals.
2	Check main panels.
3	Clean main pump inverter.
4	Check all circuit breaker.
5	Check all pressure switches.
6	Visual checking of all power and control cables.
7	Check all pneumatic solenoids.
8	Check all emergency switches.
9	Check all on/off switches.
10	Check all signal isolator.

Maintenance Tools and Equipments:

S/I No.	Tools	Functions
1	Screw driver	Ideal for service or repairing loss.
2	Center punch	Used for cutting and drilling.
3	Pipe cutter	Used for pipe cutting.
4	Hammer	Used to beat metals.
5	Hack-saw	Used for cutting purpose.
6	Tri-squire	Used for measuring purpose.
7	Wire gauge	Used for wire.
8	Adjustable wrench	Used to hold something.
9	Measuring tape	Used for measuring purpose.
10	Spanner	Suitable for driving metric/ AF.
11	Drill machine	Used for drilling purpose.
12	Chisel	Used for cutting purpose.
13	Welding machine	Used for welding purpose.
14	Ratchet	Used to hold something.
15	Pliers	Used to hold something.

CHAPTER- 8

UTILITY SERVICE

Available Utility Facilities:

1. Electricity
2. Gas
3. Water
4. Compressed air
5. Steam etc.

ELECTRICITY:

The main utility electricity is supplied from PDB and also by generator.

Specification:

Equipment Name	:	Gas generator
Nos.	:	03
Manufacturer	:	Waukesha Power Systems
Model	:	UHP 7100GSID
Volts	:	415/24 hr
RPM	:	1000
Phase	:	3
Hz	:	50
KW	:	920-1300
Duty	:	Continuous
Max. ambient Temp.	:	38 °C
Date	:	2000
Origin	:	USA

Total power is then distributed as per requirements of different section like knitting, Dyeing (yarn/ fabric), Finishing, Maintenance, WPT, ETP etc.

GAS:

Mainly gas is delivered from TITAS. It is mainly used for steam production. Generally 36 m³ gas is required to produce 1 ton of steam.

WATER:

Water is supplied in different sections continuously by using submersible and centrifugal pumps.

BOILER:

Boiler is mainly used to produce and deliver steam to different section as required. In *Esquire Knit Composite Ltd.* four boilers are used to produce and deliver steam to different section.

Specification:

1. Name : REVOTHERM
 Nos. : 02
 Type : Fire tube
 Capacity : 6 tons / hr
 Working Pressure : 8 Kg
 Origin : India

2. Name : BORDERER
 Nos. : 01
 Type : Fire tube
 Capacity : 4.5 tons / hr
 Working Pressure : 8 Kg
 Origin : Scotland

3. Name : SHELLMAX
 Nos. : 01
 Type : Fire tube
 Capacity : 4 tons / hr
 Working Pressure : 8 Kg
 Origin : India

COMPRESSOR:

Compressor is mainly used to deliver compressed air to different section as required. In *Esquire Knit Composite Ltd.* five compressors are used to produce and deliver compressed air to different section.

Specification:

- | | | |
|----------|---|------------------------------|
| Name | : | BOGE |
| Nos. | : | 05 |
| Capacity | : | 774 lt air compression / sec |
| Origin | : | Germany |

Source of Utility:

- | | | |
|-------------|---|-----------------|
| Electricity | : | PDB & Generator |
|-------------|---|-----------------|

Gas	:	TITAS
Water	:	Pumps
Compressed air	:	compressor
Steam	:	Boiler

CHAPTER- 9

STORE & INVENTORY SYSTEM

Inventory is the stock of goods. It is a vital part of business. It protect against stock outs.

The type of inventory carried in this factory as follows-

- Yarn : imported
- Dyes and chemicals : Local or Imported
- Spare parts : Local or Imported
- Packing materials : Local or Imported
- Finished fabrics : Good or Rejected

Stock of Yarn:

1. Cotton- Ne 30,26, 34,60,20,18 (card/combed)
2. Polyester
3. CVC
4. Slub Yarn
5. Milange- 5%, 10%, 15%
6. Viscose
7. PC (Polyester Cotton)
8. DP (Direct Polyester)
9. Lycra etc.

Garments Auxiliaries:

1. Button
2. Eye let
3. Snap Button
4. Many Types of labels
5. Zipper etc.

STOCK OF DYES:

1. Novacrone
2. Terasil
3. Fucocion
4. Indosol
5. Synowhite
6. Remazol
7. Flucozol

SOCK OF CHEMICALS:

Agent	Name
Detergent	Ferrol IPC
Leveling Agent	Persotex DBN
Washing Agent	Sequire P-80, Biostone TCE, Eriopon OS
Wetting Agent	QW,NOB,DA,PCLF
Absorbing Agent	SYNM
Enzyme	SQ-Enz, 383-Enz, Biozep 8000L
Sequestering Agent	Alkaquest SF40
Oil Removing	Supradet NF liq
Anticreasing Agent	Rubine OS, Persotex AFC
Antifoaming Agent	Persotex HT
Stabilizer	S-150
Stripping Chemical	Navaux RC-A, Dam
Brighting Agent	4BK,SYNO
Softening Agent	Maxsoft JT, Silicon
Basic Chemical	Soda Ash, Caustic Soda, Per Oxide, Acetic Acid, Glouber Salt, Hydrose
Washing Plant	Silicon Softener, Acramine Prifix k, Sodium Metebisulphite, potash