



**Faculty of Engineering
Department Of Textile Engineering**

Report On Industrial Attachment At

NORBAN COMTEX LTD

**Mouza Sarabo, Kashimpur Union,
Gazipur, Bangladesh.**

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This Report presented in partial fulfillment of the Requirement for the Degree of
Bachelor of Science in Textile Engineering.

Advance in Apparel Manufacturing Technology

Submission Date: December 13,2018

DECLARATION

We Hereby Declare That The Work Which Is Being Presented In This Report Entitled, **“Industrial Attachment At Norban Comtex Ltd.”** Is Original Work Of Our Own, Has Not Been Presented For A Degree Of Any Other University And All The Resources Of Collected Information For This Report Have Been Duly Acknowledged.

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Letter of Approval

13th December 2018

To

The Head

Department of Textile Engineering

102, Shukrabad, Mirpur Road, Dhaka 1207

Subject: Approval of Project Report of B.Sc. in Textile Program.

Dear Sir,

I am just writing to let you know that this industrial attachment report titled as “**Study on manufacturing process of organic cotton T-shirt**” has been prepared by the student bearing ID’s 151-23-4196 and 151-23-4236 are completed for final evaluation. The whole report is prepared based on the proper investigation and interruption through critical analysis of empirical data with required belongings. The student were directly involved in their project activities and the report become vital to spark of many valuable information for the readers.

Therefore, it will highly be appreciated if you kindly accept this project report and consider it for final evaluation.

Yours Sincerely



.....
Mst. Murshida Khatun

Senior Lecturer

Department of Textile Engineering

Daffodil International University

ACKNOWLEDGEMENT

We Pay Gratitude To The People Who Have Made Significant Contributions In Preparing This Report. Their Insights, Advices And Suggestions Helped Us A Lot. We Would Like To Pay Special Thanks To **Prof.Dr. Mahbubul Haque**, Head Of Department Of Textile Engineering, Daffodil International University For Permitting Us In This Industrial Attachment Program. We Would Also Like To Express Our Heartfelt Thanks To **Mst. Murshida Khatun**, Lecturer Of Department Of Textile Engineering, Daffodil International University For All Necessary Information For Preparing This Report.

We should like thank the management of Norban **Comtex Ltd**, for giving us opportunity to do the industrial training successfully and also their valuable suggestions.

I would like thank the management of Norban Comtex Ltd, for giving me opportunity to do the industrial training successfully and also their valuable suggestions.

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CHAPTER:1 EXICUTIVE SUMMURY

EXICUTIVE SUMMURY

Science is going to be flourished day by day. Almost every invention becomes successful due to the development of science. Technology, the modified segment of science, makes the thing possible, which was impossible yesterday. Education provides important leanings of the modern inventions and the theories and also gives us a combined knowledge over theoretical and practical studies. Literatures provide the right information which we have been learned through our university. ON the other hand practical knowledge increases the practice of theoretical perception clear and more efficient.

Internship has made this opportunity. Because we have learned theoretical knowledge last four years but due to lack of proper industrial knowledge on our course, we would not been said a complete engineer. Industrial attachment did work for us. We have taken part in this industrial attachment in Norban Comtex Ltd.

Norban Comtex Ltd is one of the renowned 100% export oriented industries in Bangladesh. The factory is concern with the production in washing, embroidery.

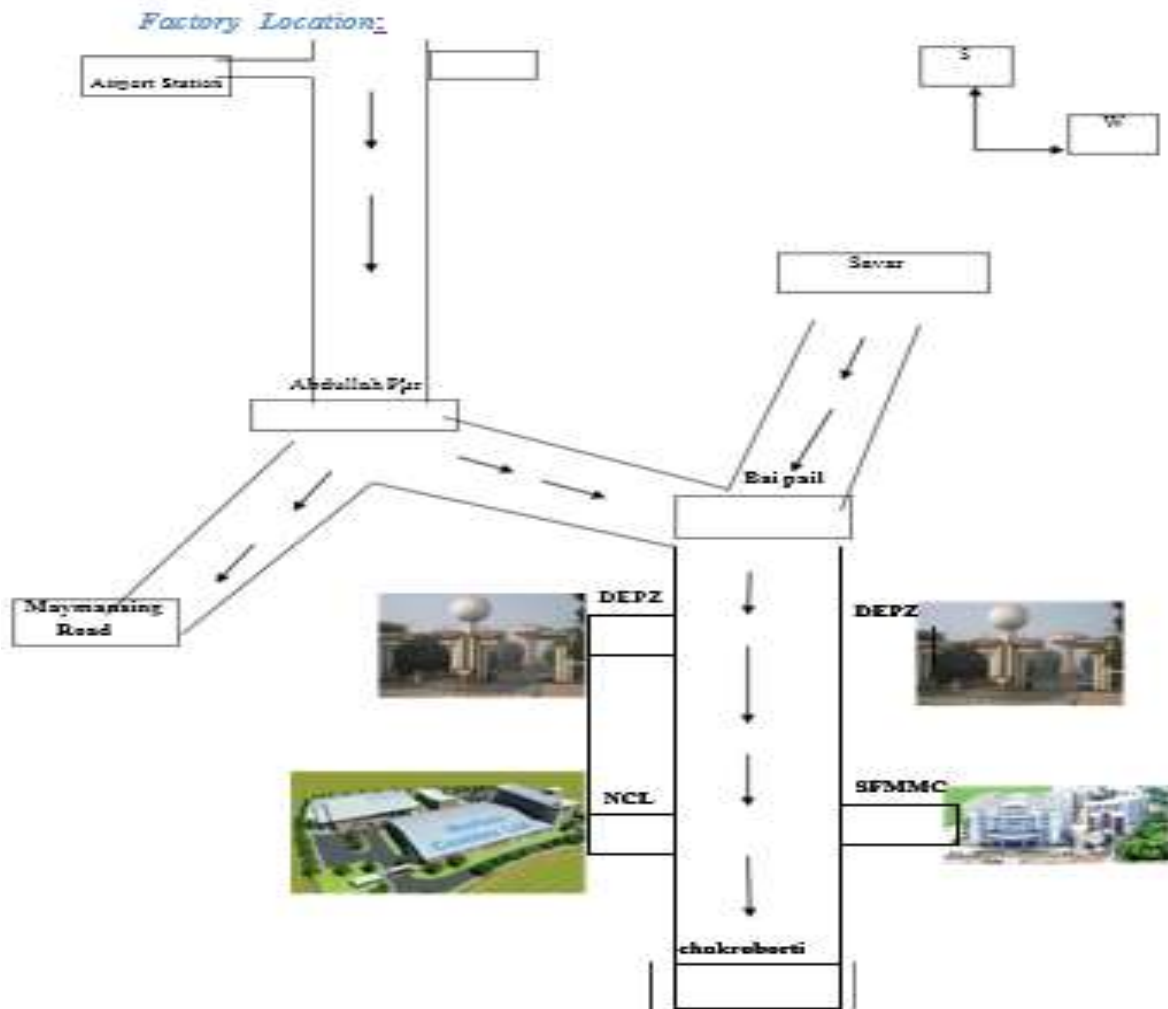
We have completed 2 months long industrial training in Merchandising, Sample, CAD and pattern, Cutting, Sewing Washing and Embroidery Section. When we started this training we did not have any idea about a the factory. During the training period we went every section of this factory. We faced a lot of technical problems, which we solved by consulting with the related persons. The respective personals of each individual sections of the industry helped us to explain their working process. We saw different types of machines, their functions, manufacturing processes, and analysis the corresponding products.

CHAPTER: 2 COMPANY PROFILE



Fig: Norban Comtex Ltd

2.1 LOCATION MAP



2.2 INTRODUCTION

The Textile Division Of Norban Comtex Ltd Is A Truly Integrated Undertaking. The Textile Division Has The Capability To Offer A Complete Product Range For The Export Textile Markets. The Goal Of The Textile Division Is To Become The Preferred Partner For Sourcing High Quality Fabrics And Clothing From Bangladesh. With Highly Advanced Technology And An Emphasis On Developing Local Human Resources, The Textile Division Has The Potential To Make An Important Contribution To The Nation's Growing Ready Made Garments Export Sector Keeping Green Environment Into Close Consideration.

2.3 Factory information

Nature of business : 100% Export Oriented Knitted Textiles, Garments & Printing Factories.

Name of the contact persons : **Mr. Wahidu IHaque Siddique**

Chairman / Managing Director
Norban Comtex Ltd.

Total employees : Male: 650, Female: 584 Total: 1234

Number of machine : Sewing: 300, Knitting: 20, Dyeing: 18

Garments production capacity: Knitting Capacity 6,000 kgs per day
Dying/ finishing capacity 15,000 kgs per day

Item of Product : 50,000 pcs per day.

Floor Space : 426,500 Sq. Feet (39,623.3 Sq. meters).

Name of the Bank : Brac Bangla Bank

Legal Form of Company : Private Limited Company.

Year of Incorporation : 2007

Project cost : 250 cores

Main Production : Basic T-Shirt, Tank top, Long Sleeve-Shirt, Polo Shirt, Shorts,
Ladies & Kids Knitwear & all kinds of knit garments & Knit fabrics.

Minimum Age of Worker : Minimum 18 years

2.5 AT A GLANCE:

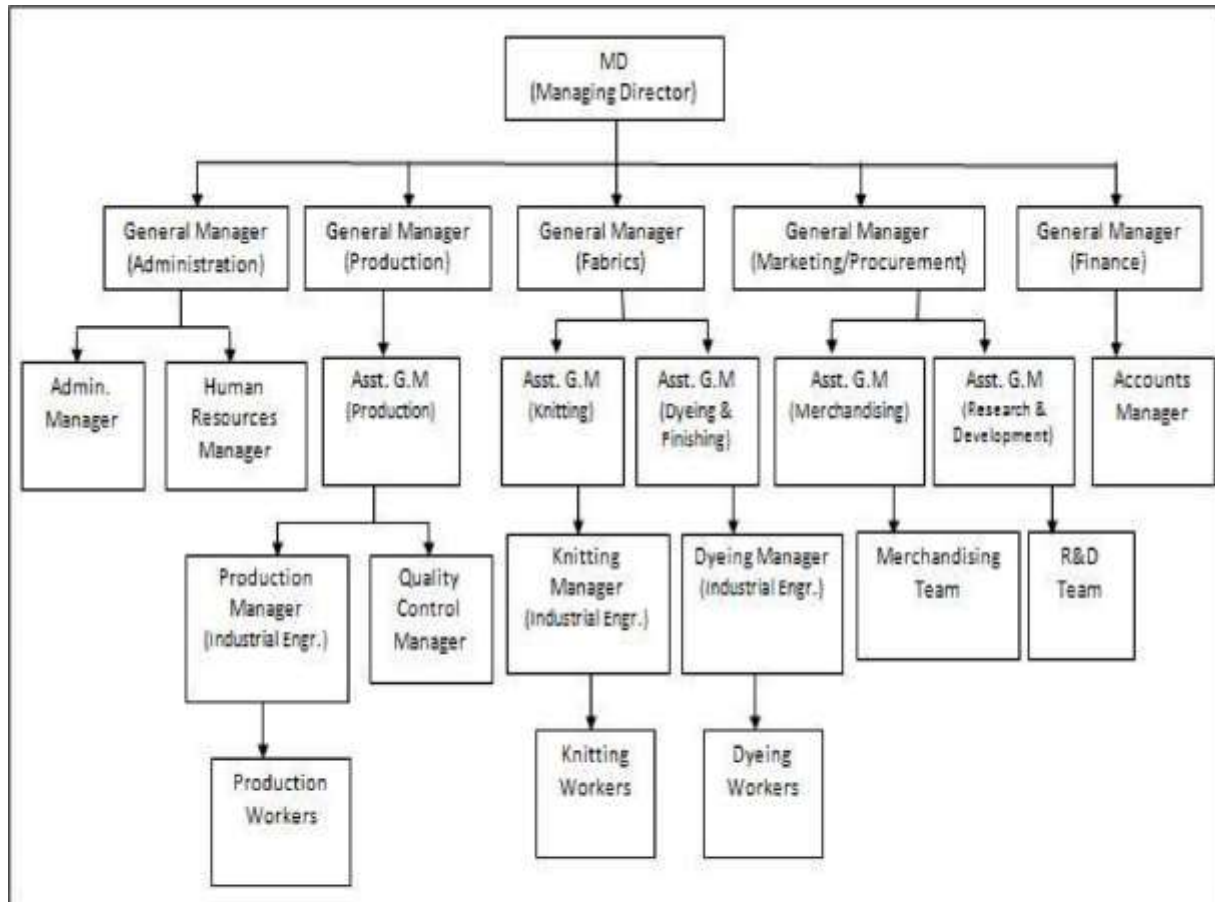
Name of Company : NORBAN COMTEX LTD.

Address : Mouza Sarabo, Kashimpur Union,
Gazipur, Bangladesh.

Corporate Office : House # 8/B, Road # 1, Gulshan-1,
Dhaka, Bangladesh
Tel: +88(0)2 8833413-20,
Fax: +88(0)2 8833423,

Email : info@norbangroup.com

2.6 COMPANY ORGANOGRAM



2.1 Human Resource Department

Human resource is a term with which many organizations describe the combination of traditionally administrative personnel functions with performance management, Employee Relations and resource planning. The objective of Human Resources is to maximize the return on investment from the organization's human capital and minimize financial risk. It is the responsibility of human resource managers to conduct these activities in an effective, legal, fair, and consistent manner.

2.7 Item of product:

Area of manufacturing

- ❖ Children
- ❖ Wear Ladies
- ❖ Wear Men's Wear

Types of Manufacturing

- ❖ T-Shirt
- ❖ Polo Shirt
- ❖ Sweat
- ❖ Jacket
- ❖ Men's underwear
- ❖ Other on specific demand

2.8 MAJOR BUYER

C&A

PRIMARK

MGB

CENTERLINE

KITARO

DEBENHAMS

NCL

2.9 MISSION AND VISION

Mission

At Norban Comtex Ltd, we strive to provide world class service and the best value to our customers. We thrive for excellence and work for ensuring a pleasant, clean and professional working condition for our employees and the people we do business with

Vision



Gain market leadership in high value added apparel in USA & Europe.

Use “Innovation” and “Speed” as prime drivers, rather than cotton & cheap labor.

Dominate these market in high quality

Men’s T-shirt & polo shirt

Ladies item

Kids wear

2.10 Responsibility:

Responsibility of Production officer

- ❖ To make the programmed card according to daily production plan.
- ❖ Prepare sewing lines of floor & report to A.G.M. in three time everyday Receives cutting fabrics according style, color and size form cutting section.
- ❖ To check the layout of garments.
- ❖ Maintain floor discipline & cleanness.
- ❖ Any other works as & when required by the management.

Responsibility of Production Manager

- ❖ To the programmed card according to daily production plan.
- ❖ Cutting check and proper installation of cutting fabric for sewing.
- ❖ Control of supervisor, operator, asst. operator & helper of garments floor.
- ❖ To match different part of garments according to approve sample.
- ❖ To find out sewing fault as early as possible.
- ❖ To rectify the finished garments this rejected from quality control department.

Remarks:

- The manpower management system of this factory is well arranged. Every officers & stuffs are responsible for their duty. But there are some textile engineers in the industry for Garments and Merchandising. It is prevent for fluent production. The efficiency of the worker should be increased for more quality production.

CHAPTER: 3

DESCRIPTION ABOUT ATTACHMENT

3.1 KNITTING SECTION

3.1.1 KNITTING SECTION



Fig: Knitting Section Of Norban Comtex Ltd

3.1.2 MACHINE DESCRIPTION OF CIRCULAR KNITTING SECTION

Circular Knitting Machine: 17

Flat knitting: 16

Total no of M/C: 33

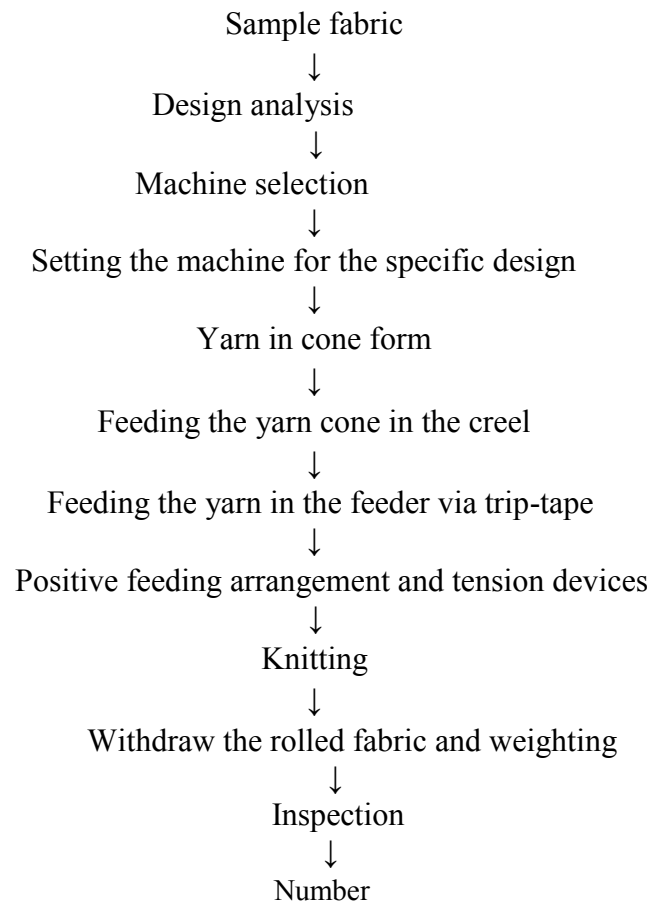
Machine No.	Specification	Capacity	Brand
Circular Auto striper- 01	DIA- 34X24/28G Auto Striper Single Jersey	120 Kg/Day	PAILUNG
Circular Auto striper- 02	DIA- 34X24/28G Auto Striper Single Jersey	120 Kg/Day	PAILUNG
Circular Auto striper- 03	DIA- 34X24/28G Auto Striper Single Jersey	120 Kg/Day	PAILUNG
Circular Knitting- 01	DIA- 42X18/24G (1X1 RIB)	350 Kg/Day	LISKEY
Circular Knitting- 02	DIA- 42X18/24G (1X1 RIB)	350 Kg/Day	LISKEY
Circular Knitting- 03	DIA- 42X18/24G (1X1 RIB)	350 Kg/Day	LISKEY
Circular Knitting- 04	DIA- 42X18/24G (1X1 RIB)	350 Kg/Day	LISKEY
Circular Knitting- 05	DIA- 42X18/24G (1X1 RIB)	350 Kg/Day	LISKEY
Circular Knitting- 06	DIA- 36X18/24G Single Jersey	300 Kg/Day	LISKEY
Circular Knitting- 07	DIA- 36X18/24G Single Jersey	300 Kg/Day	LISKEY
Circular Knitting- 08	DIA- 36X18/24G Single Jersey	300 Kg/Day	LISKEY
Circular Knitting- 09	DIA- 36X18/24G Single Jersey	300 Kg/Day	LISKEY
Circular Knitting- 10	DIA- 36X18/24G Single Jersey	300 Kg/Day	LISKEY
Circular Knitting- 11	DIA- 36X18/20/24/28G Fleece/Heavy Jersey	350 Kg/Day	LISKEY
Circular Knitting- 12	DIA- 36X18/20/24/28G Fleece/Heavy Jersey	350 Kg/Day	LISKEY
Circular Knitting- 13	DIA- 36X18/20/24/28G Fleece/Heavy Jersey	350 Kg/Day	LISKEY
Circular Knitting- 14	DIA- 36X18/20/24/28G Fleece/Heavy Jersey	350 Kg/Day	LISKEY
Flat Knitting- 01	Flat Collar/Cuff, Bed- 72 Inch, 14 G	300/600 Pcs	LISKEY
Flat Knitting- 02	Flat Collar/Cuff, Bed- 72 Inch, 14 G	300/600 Pcs	LISKEY
Flat Knitting- 03	Flat Collar/Cuff, Bed- 72 Inch, 16 G	250/500 Pcs	LISKEY
Flat Knitting- 04	Flat Collar/Cuff, Bed- 72 Inch, 16 G	250/500 Pcs	LISKEY

Flat Knitting- 05	Flat Collar/Cuff, Bed- 40 Inch, 14 G	300/600 Pcs	LISKEY
Flat Knitting- 06	Flat Collar/Cuff, Bed- 40 Inch, 14 G	300/600 Pcs	LISKEY
Flat Knitting- 07	Flat Collar/Cuff, Bed- 40 Inch, 14 G	300/600 Pcs	LISKEY
Flat Knitting- 08	Flat Collar/Cuff, Bed- 40 Inch, 14 G	300/600 Pcs	LISKEY
Flat Knitting- 09	Flat Collar/Cuff, Bed- 40 Inch, 14 G	300/600 Pcs	LISKEY
Flat Knitting- 10	Flat Collar/Cuff, Bed- 40 Inch, 14 G	300/600 Pcs	LISKEY
Flat Knitting- 11	Flat Collar/Cuff, Bed- 40 Inch, 14 G	300/600 Pcs	LISKEY
Flat Knitting- 12	Flat Collar/Cuff, Bed- 40 Inch, 14 G	300/600 Pcs	LISKEY
Flat Knitting- 13	Flat Collar/Cuff, Bed- 40 Inch, 14 G	300/600 Pcs	LISKEY
Flat Knitting- 14	Flat Collar/Cuff, Bed- 40 Inch, 14 G	300/600 Pcs	LISKEY
Flat Knitting- 15	Flat Collar/Cuff, Bed- 40 Inch, 14 G	300/600 Pcs	LISKEY
Flat Knitting- 16	Flat Collar/Cuff, Bed- 40 Inch, 14 G	300/600 Pcs	LISKEY



Fig: Knitting Section

3.1.3 Process flow chart of knitting in norban



3.1.4 Knitting:

Knitting is defined as the construction of fabric by interlocking/interloping/interloping of a single/double/triple yarn with the help of hooked needles by forming kink of yarn. Knitting is the method of creating fabric by transforming continuous strands of yarn into a series of interlocking loops, each raw of such loops hanging from the one immediately proceeding.

Types of knitting:

- ❖ Warp Knitting
- ❖ Weft Knitting
- ❖ **Warp knitting:** Warp Knitting is a method of forming a fabric in which the loops are made in vertical way along the length of the fabric from each warp yarns and intermeshing of loops take place in a flat form of length wise basis.
- ❖ **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.

Produced Fabric:

1. **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, Heavy s/j, Herringbone terry, Diagonal Terry, Double Face, Slub S/J etc.
2. **Rib:** It requires two sets of needles positioned at right angles to each other to form the fabric.
3. **Example:** (1x1) Rib, (2x2) Rib, (2x1) Rib, (3x1) Rib, (3x2) Rib, (3x3) Rib, (4x1) Rib, (4x2) Rib, (4x3) Rib, (4x4) Rib, Flat bed Rib, Mini waffle, waffle, Ottoman Rib, Lacost Rib, Point de roam, Bonded, 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

SOME FABRIC'S GSM IS SHOWN WITH CHANGING YARN COUNT

Sl. No.	Fabric Type	Yarn Count	Sl. (mm)	GSM
1.	Strip S/J	26/1	2.86	160
2.	S/J	30/1	2.80	150
3.	Double Pique	32/1	2.58	165
4.	1/1 Rib	30/1	2.60	220
5.	1/1 Rib	20/1	3.20	270
6.	1/1 Rib	24/1	2.90	220
7.	1/1 Rib	28/1	2.67	200
8.	1/1 Rib	32/1	2.45	200
9.	S/J	28/1	2.78	155
10.	S/J	40/1	2.45	110
11.	S/J	28/1	2.75	160
12.	Full Feeder Lycra S/J	34/1	2.90	180
13.	Full Feeder Lycra S/J	30/1	2.95	200
14.	Full Feeder Lycra S/J	28/1	2.80	160
15.	Full Feeder Lycra S/J	26/1	2.90	160
16.	1/1 Rib	24/1	3.00	270
17.	1/1 Rib	40/1 cvc	2.80	250
18.	2/2 Rib	30/1	2.78	220
19.	1/1 Lycra Rib	30/1 + 40D	2.90	230
20.	Strip S/J	26/1	2.86	160

3.2 DYEING SECTION

3.2.1 DYEING SECTION



Fig: Dyeing section of Norban Comtex Ltd

3.2.2 MACHINE DESCRIPTION OF DYEING SECTION:

Machine NO.	Specification	Capacity	Brand	Origin
Dyeing-01	Innoecology HT1 XC1	200 Kg	Brazzoli	Italy
Dyeing-02	Innoflow HT1 XC2	250 Kg	Brazzoli	Italy
Dyeing-03	Innoflow HT2 XC2	500 Kg	Brazzoli	Italy
Dyeing-04	Innoflow HT2 XC2	500 Kg	Brazzoli	Italy
Dyeing-05	Innoflow HT2 XC2	500 Kg	Brazzoli	Italy
Dyeing-06	Innoflow HT3 XC2	750 Kg	Brazzoli	Italy
Dyeing-07	Innoflow HT3 XC2	750 Kg	Brazzoli	Italy
Dyeing-08	Innoflow HT4 XC2	1000 Kg	Brazzoli	Italy
Dyeing -09	Innoflow HT4XC2	1500 kg	Brazzoli	Italy
Dyeing -10	Innoflow HT4XC2	1500 kg	Brazzoli	Italy
Dyeing -11	Innoflow HT2XC2	250 kg	Brazzoli	Italy
Dyeing-12	Innoflow HT2XC2	250 kg	Brazzoli	Italy
Sp Dyeing-13	Aquarius Dyeing Machine	25 Kg	Brazzoli	Italy
Sp Dyeing-14	Overflow Dyeing	50 Kg	Brazzoli	Italy
Sp Dyeing-15	Overflow Dyeing Machine MOD RCL-25	25 Kg	Brazzoli	Italy
Sp Dyeing-16	Overflow Dyeing Machine MOD MBC-25	25 Kg	Brazzoli	Italy
Turning-01	Fabric Reversing Machine	10000 Kg	Beneks	Turkey
Auto Dyes and Chemical Dissolving System	Dyestuff check and weighting system, Dissolving System, Chemical reserving and auto dispensing		3GDOS/ Brazzoli	Italy

3.2.3 Different type of dyeing machine:



Fig: Dryer Machine



Fig. Stenter & Compactor M/C

Slitter Machine

Slitter machine is used for tubular knit fabric to make it in open form. In open form fabric finishing line; slitter machine is used after hydro-extractor, de-watering and drying machine.

Slitting is a process that is applied for cutting the tubular fabric through the intended break Wales line on lengthwise direction prior to stenter processing. During slitting, it is required to be aware about the cutting line otherwise, fabric faults can be occurred there.



Figure: Slitter machine.

3.2.4 Fabric Finishing Machineries Details:

Machine N0.	Specification	Brand
Stenter-01	Flat Stenter IC-10 of 8 Chamber for Drying and Heat setting	Icomatex, Spain
Dryer-01	Santex Dryer Type, 5 Chamber	Santex/DIPL-Ing. Stephan Heinrich-, Switzerland
Compector-01	Revolution 2500 with 9.7 M Tender/Equalizer Model E2500	Ferraro, Italy

Compector-02	Decatizing Calender/Compacting Machine, Model CUD/FV 1500, Working width 1.35 M (Tubular)	Ferraro, Italy
High speed Brush sueding Machine	Model: Lisa 4 Knit Plus(open width and tubular processing)	Mario Crosta, Italy
High speed Double Drum Raising machine	Model MC20/24 GF knit open tub(open width and tubular processing)	Mario Crosta, Italy
Slitting-01	Superslit Slitting Line 2400 MM	Corino, Italy
Squeezer-01	Tubular Spreading and double ballooning with double stretcher	Bianco, Italy
Back Sewing-01	Edge Sewing Machine	Beneks, Turkey
Tumble Dryer-01	GDP-150 Drying Machine	Guangzhou Panyu
Tumble Dryer-02	GDP-150 Drying Machine	Guangzhou Panyu
Tumble Dryer-03	GDP-150 Drying Machine	Guangzhou Panyu
Tumble Dryer-04	GDP-150 Drying Machine	Guangzhou Panyu
Tumble Dryer-05	GDP-150 Drying Machine	Guangzhou Panyu
Tumble Dryer-06	GDP-150 Drying Machine	Guangzhou Panyu
Hydro Extract -01	KZ-125 Kg Dewater Machine	Guangzhou Panyu
Hydro Extract -02	KZ-125 Kg Dewater Machine	Guangzhou Panyu
Inspection Machine-01	Tensionless Inspection machine with metering system	Hsing Cheng
Inspection Machine-02	Tubular Fabric Inspection machine	Hsing Cheng

3.3 LAB SECTION

Lab Dip

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

3.3.1 Objective of Lab Dip

The main objectives in lab dip are as follows.

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

Lab dip preparation:

- ❖ Receiving standard swatch
- ❖ Spectrophotometer reading
- ❖ Recipe start up software
- ❖ Start up recipe given
- ❖ Manual dispersion (pipatting)
- ❖ Pot dyeing
- ❖ Unload
- ❖ Normal wash
- ❖ Acid wash
- ❖ Hot wash
- ❖ Cold Rinsing
- ❖ Drying

3.3.2 M/C Used in Lab Dip:

1. Machine name: Specto photo meter SF 600CT plus

Made by : Data Color International

Origin : USA

Supplier : Data Color International

2. Machine name : Light box

Made by : Venvide

Made in : England

This includes 4 types of light-

-TL84

-D65

-Fluorescent

-Ultraviolet

Machine no : 01

Name of m/c : RAPID

Temperature : 130 C

Made by : Roaches

Made in : England

Supplier : Roaches (Mazim Trading Company)

Machine no : 02

Name of m/c : RAPID

Temperature : 130 C

Made by : Roaches

Made in : England

Supplier : Roaches International Ltd.

Machine no : 03

Name of m/c : Sample Dryer

Made by : Selecta

Made in : Spain

Supplier : Mazim Trading Company

Machine no : 04

Name of m/c : Magnetic Stuart Machine (Color Mixing)

Made in : England

Pipette used in dyeing lab

0.01, 0.1, .5, 1, 2, 5, 10, 20 ml etc

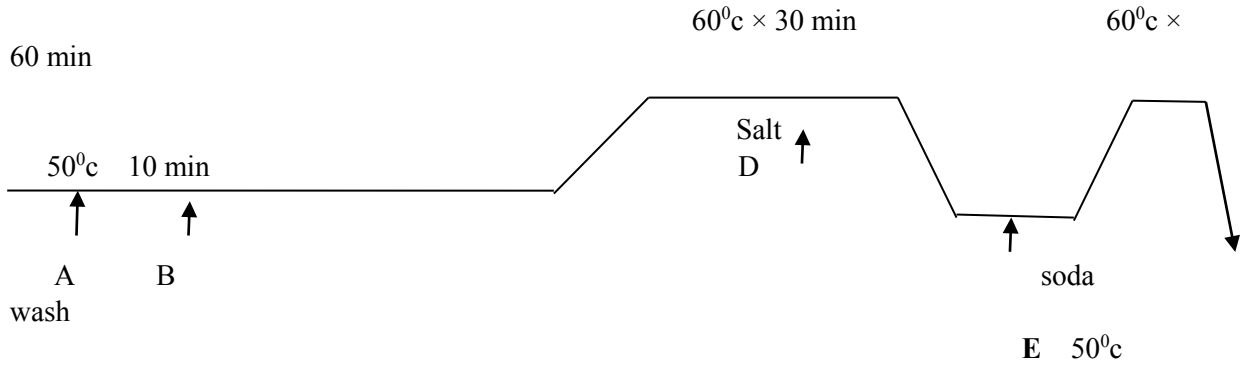
3.3.3 Lab Sample Dyeing:

Sample:

- Type - 100 % cotton fabric
- Weight — 10 gm
- Leveling agent : 2.0 g/l
- Nova yellow S3R :0.45
- Nova Red SB :1.7
- Nova Blue FNR :0.02
- Salt(20% / solid) : 20 g/l
- Soda ash (20% solution): 18 g/l

Curve:

For Dyeing



Here,

A= Fabric + Water

B= Chemical

D= Salt Dosing

E= Soda Ash Dosing

p^H= 10

Fig: Lab dyeing curve

Procedure:

- ❖ At first the recipe for the sample is calculated according to the sample weight.
- ❖ The fabric is kept in the dyeing chamber.
- ❖ Then the dyes, chemicals, salt & required amount of water is taken in that dyeing chamber by digital pipetting on the basis of stock solution.
- ❖ Then the beaker is set into the lab dip. Dyeing machine for dyeing.
- ❖ The program for dyeing is started for 20 mm at 50°C.
- ❖ After 20 mm soda is added by pipetting.
- ❖ Then the dyeing program is set for 60 mm at 60°C.
- ❖ When the dyeing time is finished the sample is taken out from the machine at 40°C.
- ❖ Then the sample is washed off. At first cold wash & then hot wash is done. After it soaping is done.
- ❖ Then the sample is dried and compared with standard.

3.3.4 P^H range for different dyes :

Name of process	P ^H Range
1.Scouring	12.5
2.H ₂ O ₂ bleaching	10.5-11
3.Enzyme bio polishing	4.5
4.Dyeing leveling	6.5
5.Salt	7-8
6.Reactive dye	10.5-11.5
7.Disperse dye	4.5-6
8.Sofener	6.5
9.Initial dye bath	5.5-6.5
10.Neutralization	5.5-6.5
11.After alkali addition	10.5-11.5
12.After dyeing	5-6
13.Cationic softener	4-5
14.Before leveling	6-6.5
15Silicon softener	5.5-6

N.B : If the P^H less, depth of shade & the amount of dye fixing is also less. The lower range of dyeing P^H is 10.5. Below P^H=10.5 dyeing is not happened.

Process Time :

No	Fabric Type	Time (hour)
1	White Fabric	4-5
2	100% Cotton reactive	8-10
3	100% polyester	5
4	CVC blend both part	13-14

Liquor Ratio:

No	Operation type	L:R
1	Scoring & bleaching	1:6
2	Chemical hot wash	1:8
3	P ^H hot	1:8
4	Normal wash	1:5
5	Acid+ Enzyme	1:5

Temperature :

No	Process	Tem ^r (°C)
1	Cotton pretreatment	100
2	Cotton Scouring	105
3	Caustic addition	65
4	Peroxide addition	70
5	Peroxide killing	80
6	Bio polishing	55
7	Optical brightening	80
8	Polyester dyeing	100-130
9	Softening	45
10	Cotton dyeing	50-60
11	Terquissh Migration	80
12	Iso thermal dyeing	60
13	Cotton reactive stripping	100
14	Softening& fixing	40
15	Cotton hot wash	90
16	Cotton acid wash	50-60

3.4 CUTTING SECTION

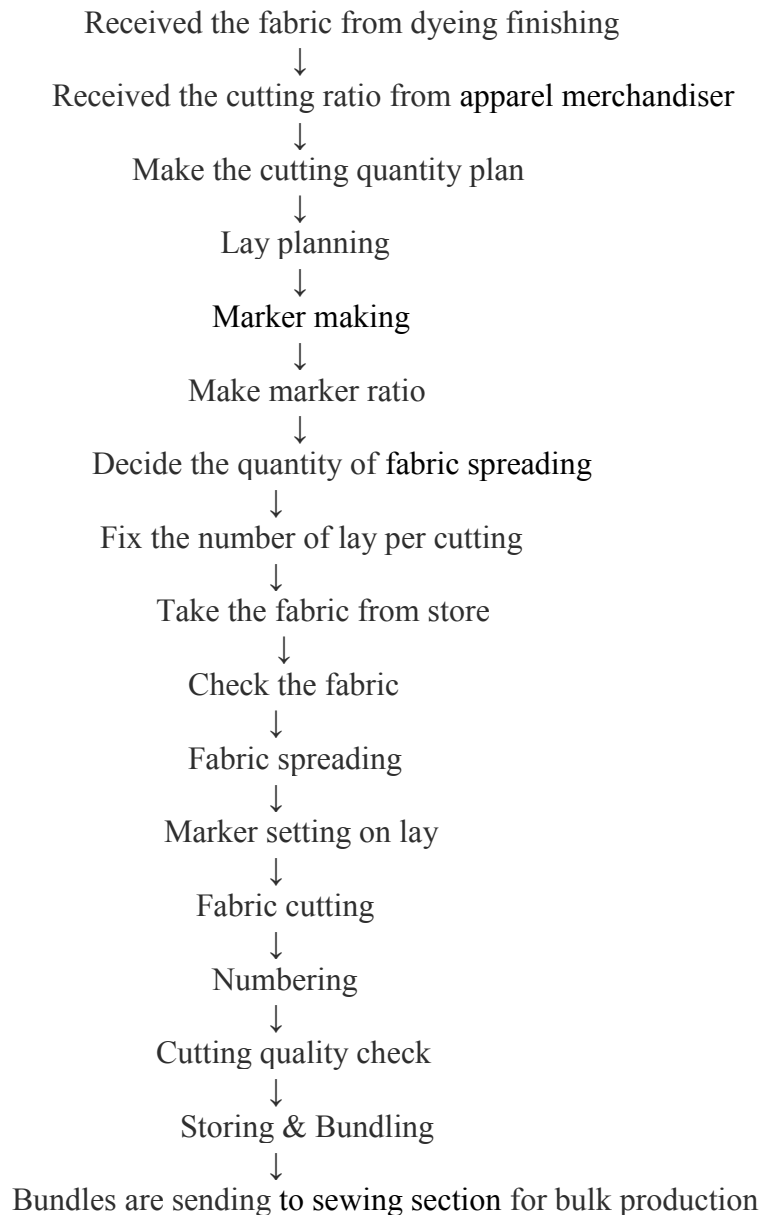
CUTTING

Cutting is one of the major process in **garments manufacturing**. Here garments parts are cutting according to the pattern. In garments cutting department, a process flow chart have to maintained to send the right measurement parts in the next process for making quality garments. As its importance in garments manufacturing, a process flow chart for garments cutting department is presented in this article.



Fig: cutting

3.4.1 Flow Chart Of Cutting



3.4.2 Function of cutting department with process sequence:

Received the fabric from dyeing finishing:

When merchandiser confirm about the work order sheet, then cutting section received the required fabric from the dyeing section.

Received the cutting ratio from merchandiser:

Merchandiser sends a cutting ratio for every style of garment to do this job smoothly.

Make the cutting quantity plan:

Cutting manager should make the perfect cutting quantity plan.

Lay planning:

Before fabric spreading, cutting manager and in-charge make a plan about fabric lay.

Marker making:

To finish the accurate cutting process, marker making must be needed for each style of garment.

Make marker ratio:

In this stage marker maker prepare a marker ratio to complete this cutting process.

Decide the quantity of fabric spreading:

Before spreading, cutting in charge take the decision, how many fabrics spreading are required?

Fix the number of lay per cutting:

They also fixed the number of lies which are appropriate for each cutting.

Take the fabric from store:

For cut the every style of garment, cutting in charge receive the fabric from store.

Check the fabric:

Cutting supervisor inspect the fabric faults like, fabric holes, color shading, and any other defects on fabric.

Fabric spreading:

In this stage, fabrics are spread on cutting table according to correct lay height and ply tension.

Marker setting on lay:

When fabric spreading completely done, then the different size and styles of marker set on the top layer of the fabric lay.

Fabric cutting:

Finally fabric cutting is done here.

Numbering:

When the cutting process is finish then numbered the every style of fabric parts to avoid the mixing.

Cutting quality check:

In this stage check the all cutting fabrics quality.

Storing & Bundling:

Fabric cutting parts are storing and bundling here according to color, size and style.

Bundles are sending to sewing section for bulk production:

Finally all bundles are sending to the sewing section for completing bulk production.

3.4.3 Straight knife cutting machine

Machine name	: K.M company cloth cutting m/c
Model	: K.M KS_AUV
Producer	: made by K.M cutting m/c co, JAPAN
Type	: Heavy duty industrial cloth cutting m/c self-sharpening
Dimension	: 8 inch width * 11 inch length * 24 inch height
Weight	: 33.5 lbs.
Current	: A.C (3.3/2.6 amps)
Speeds	: 3000/3600 r.p.m



Fig: Straight Knife Cutting Machine

3.5 SEWING SECTION

3.5.1 Sewing Machines:

Plain Machine

The S-1110A (Replaces: model SL1110) is Brother's new standard industrial high speed single needle lockstitch sewing machine.

S-1110A-3 single needle straight stitch flatbed lockstitch machine for light to medium material (5500spm) complete with stand, table and with the added bonus of the 240volt single phase servo motor (silent) runs only when the machine is in operation (assembled).

Servo Motor: An electronically controlled motor which only works when you start to sew, unlike the conventional clutch motor which runs once you turn the power on, consuming electricity. With the advancement in energy-saving technology, using a servo motor, can give you a power consumption saving of up to 60% as proved in manufactures tests against a standard clutch motor.



Figure: Plain machine

Over lock Machine:

Specifications:

- Brand: Pegasus
- Origin: Japan
- Max. Speed: 8500 r.p.m
- Stitch Length: 0.6mm-5.2mm
- Over edge width: 1.5mm-8mm
- Presser foot lift: up to 8mm
- Differential feed ratio: 1:0.4-1:3.2

Flat lock machine:

Specification:

- Completely block oil leakage, adopting a state-of-the-art "Oil Barrier" technology!
- Produces beautiful and quality decorative stitches which are soft to the skin.



Figure: Flat lock stitching machine.

Remarks:

Some of the machines are too old. The catalogues of these machines are no longer available in industry, also in website. That's why those machines specifications can't be described.

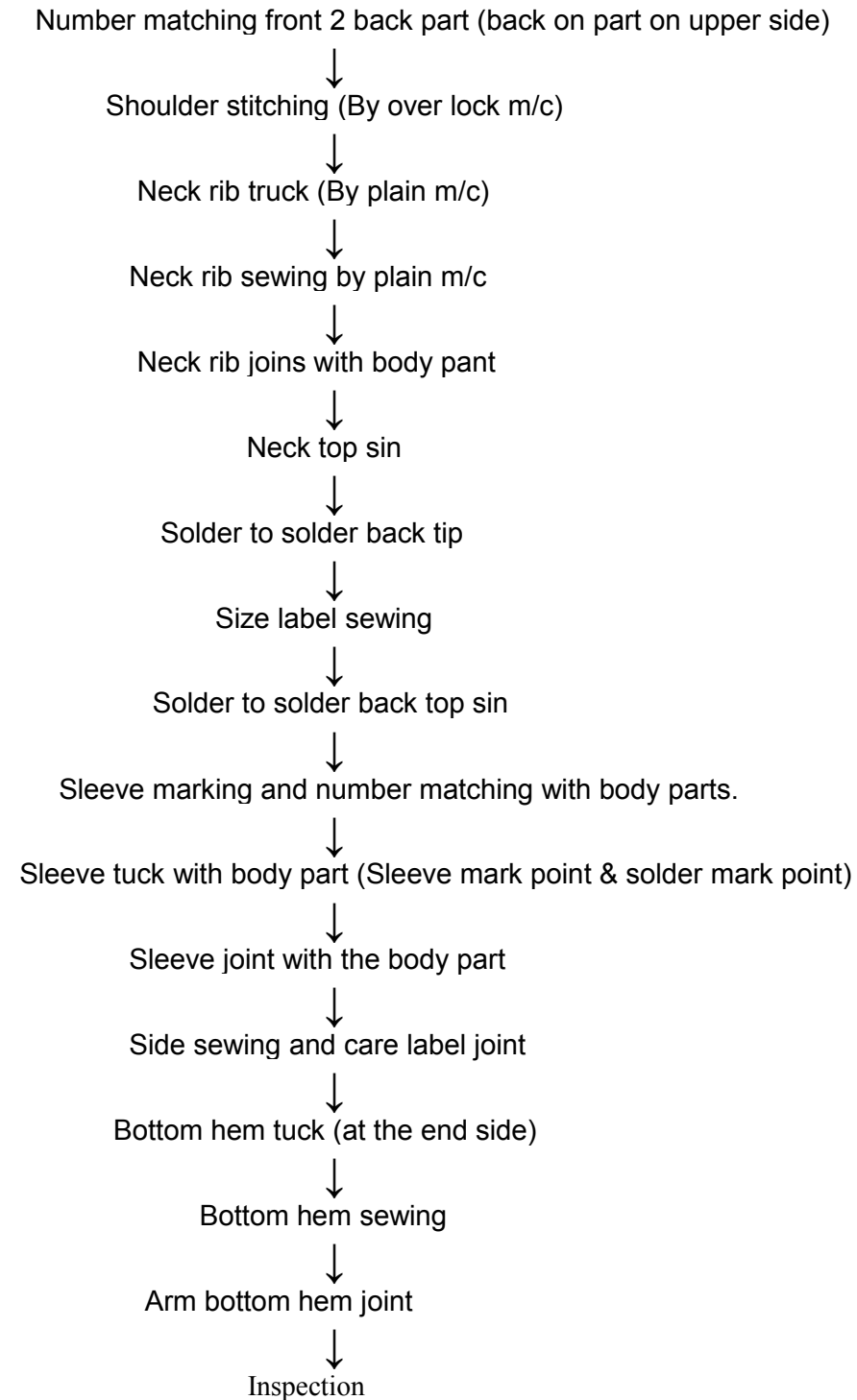
Bar tag machine:

Bar tack is a series of hand or machine made stitches used for reinforcing areas of stress on a garment, such as pocket openings, bottom of a fly opening or buttonholes. It consists of a series of close-set zigzag stitches (machine) or whip stitches (hand), usually 1/16"-1/8" in width and 1/4"-3/8" in length. In denim jeans, it is often in a contrasting color, such as orange or white.



Figure: Bar tack machine

3.5.2 Sewing Sequence of T-shirt Manufacturing Process



3.6 SAMPLE SECTION



Fig: Sample Section

3.6.1 TYPES OF SAMPLE

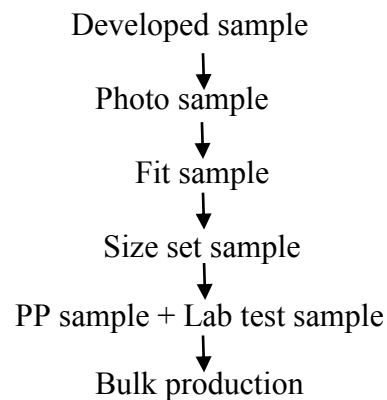
- ❖ Design / proto sample.
- ❖ Fit sample
- ❖ Size set sample
- ❖ Counter sample
- ❖ Pre –production / tag sample
- ❖ Shipping sample
- ❖ Photo sample
- ❖ Style fit sample.

Sample & measurement sheet is given by the buyer through buying house or directly from buyer.

The Sample section of this factory is highly richer included with:

- 4 sewing line
- Per sewing line consisted with 16 various types of sewing machine
- One cutting table
- Inspection table
- 2 iron table

3.6.2 SAMPLE MAKING FLOW CHART



3.6.3 BUYER RECOMMENDED SAMPLE LIST

AEO	Developed sample Meeting sample PP sample Fit sample PR (public relation) sample Lab test sample Size set sample
Lands' End	Developed sample Fit sample Meeting sample Photo sample

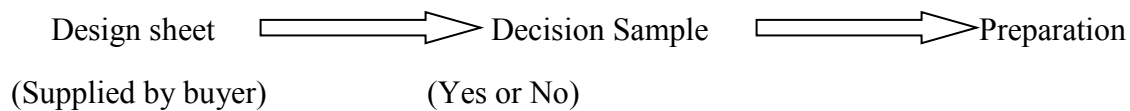
	Lab test sample PP sample
GAP	Developed Wash GPT Green Tag Sealer

3.6.4 PRODUCT DEVELOPMENT

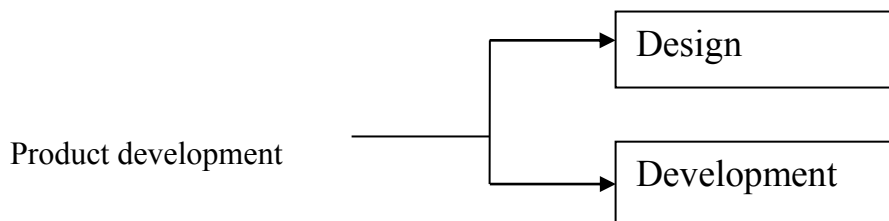
This department plays an important role in a garment industry. When buyer places an order, a design sheet is provided, where the entire design is illustrated elaborately. This department studies and examines that design and reaches to a decision of whether the order will be taken or not using the existing facilities. Some major objectives of this section are:

1. Review the technical information and planning for the schedule of delivery date after received new style
2. Analyze and arrange materials required for new styles. A sequence can be drawn here:
3. In house all required materials within planned time frame.
4. Embellishment development and approval from within the planned time frame
5. Co- ordinate with sample department
6. Presentation of seasonal collection to buyer

An operational sequence can be drawn as:



Product development functions may be divided as:



3.7 MERCHANDISING SECTION

Garments Mean Apparel Or Clothing Merchandising Mean Buying, Producing, Selling Of Any Goods Or Services For The Local Or International Market And Other The Term “Merchandising” Is Well Known To The Person Especially Involved In Garments Trade. Garments Merchandising Means Buying Raw Materials And Accessories, Producing Required Garments, Maintaining Required Quality Level And Exporting The Garments Within Schedule Time Frame.

3.7.1 MERCHANDISER VS BUYER CO-ORDINATOR (B.C.)

In Standard Group The Merchandising Department Is Mainly Divided Into Two Division. They Are –

- ❖ Merchandiser
- ❖ Buyer Co-Coordinator (B.C)
- ❖

Merchandiser

The Person Who Involves In This Job Or Does Is Known As A Merchandiser.

- ❖ Builds Up Relationship With The Buyer.
- ❖ Act As A Seller.
- ❖ Plays The Vital Role In An Organization Bearing Responsibilities Of A Garments Order.

Buyer Co-Ordinator (B.C.)

- ❖ The Person Who Involves In Development Of The Product & Follow Up The Whole Process From Sample Development To Shipment Is Known As A Buyer Co-Ordinator.
- ❖ He/She Co-Ordinate With The Merchandiser As Well As With Buyer.
- ❖ He/She Plays A Vital Role In The Garments.

3.7.2 ROLE OF A GARMENT MERCHANDISER

The Main Role Of A Garments Merchandiser Is To Collect Garments Export Order (Export L\C), Produce The Garment, Export The Garment And Profit. To Perform Those Functions Successfully Need Lot Of Knowledge, Experience And Tremendous Effort For A Merchandiser.

3.7.3 MAJOR RESPONSIBILITIES OF A MERCHANDISER

- ❖ Negotiation
- ❖ Production
- ❖ Calculation Yarn/Fabric Consumption
- ❖ Calculation Costing Of The Product
- ❖ Oder Sourcing/Supplies
- ❖ Monitoring Quality Aspect
- ❖ Product Development
- ❖ Liaison With Buyers Customers & Factory
- ❖ Factory Scheduling

3.7.4 QUALITY OF A MERCHANDISER

- ❖ Good Knowledge On English Language In Both Written And Spoken.
- ❖ Know The Email Writing Techniques.
- ❖ Know The World Map And All Sea And Air Route.
- ❖ Know All Fibers(Natural, Animal, Mineral, Synthetic Etc.)
- ❖ Know All Types Of Woven And Knitted Fabrics Weaving/Knitting Pattern(Woven, Knit Fabric)
- ❖ Know All Types Of Printing.
- ❖ Should Be Able To Differentiate All Type Of Embroideries.
- ❖ Should Know All Type Of Samples And Their Implication.
- ❖ Know All Type Lab Test Requirement.
- ❖ Keep Record Of All Yarn, Fabric And Accessories Supplier.
- ❖ Know All Sea And Air Freight Forward.

3.7.5 THE CHRONOLOGICAL PROCESS OF MERCHANDISING

Actually Merchandising Activities Started By Introducing With The Buyers. Introducing May Occur By Two Ways-

1. Buyer To Seller
2. Buyer To Buying House And Buying House To Seller.

Generally They Communicate With Them By Emails, Telephones Or Mobiles.

Receiving Of Orders

Merchandiser Receives Order Of A Specific Garment From Buyer In The Form Of Package Of Information Known As 'Techpack/Spec sheet'. A Techpack Contains Details About The Ordered Garment. It Contains-

- ❖ Detailed Photograph Of The Sample Or Sketch
- ❖ Fabric Details
- ❖ Details Of Accessories And Trims
- ❖ Patch Label, Main Label Details
- ❖ Measurement Details
- ❖ Color Details
- ❖ Details Of The Season
- ❖ Logo Design
- ❖ Details Of Wash Care Label And Size Label
- ❖ Details About Extra Finishes Etc.

3.7.6 Flow Chart of Garments Merchandizing:



3.8 FINISHING SECTION

Finishing is the last stage of packed garments those are ready for sale. Therefore, it is one of the most important stage in whole garments manufacturing process. In a garment industry finishing section involves with garment washing, checking, final inspection, pressing, packing, etc. Proper finishing process can be improved quality of garments and make on time order shipment. Now I would like to discuss about the garments finishing process steps by steps.

3.8.1 Lay out of finishing sectors

- ❖ Finishing received
- ❖ Used sucker machine
- ❖ Steam iron
- ❖ Quality check
- ❖ Sizing
- ❖ Hand tag
- ❖ Metal detector machine
- ❖ Hanger attachment
- ❖ Folding
- ❖ Assort
- ❖ Poly
- ❖ Carton

3.8.2 WORK OF FINISHING SECTION

1. Check shade correctly.
2. Check workman ship.
3. Check measurement.
4. Check label.
5. Maintain daily report.

3.9 PACKING SECTION

3.9.1 MACHINE INFORMATION

Needle Detector Machine

Company: Hashima

Model: HN-740G



Fig: Needle Detector Machine

The Accessories which are used for garment packing during garment shipment to buyer are called packing accessories. Packing accessories are depended on garment packing and folding etc which is instructed by buyer.

Poly bag, packing board, tissue paper, hanger, scotch tape, gum tape, carton etc are part of packing accessories.

Packing should be varying (as per buyer garment packing instruction) in different orders as per instruction of buyer garments packing. , The number of one carton garments it is weight on depend carton quality.

Understand quality of carton follow 3 ply, 5 ply, and 7ply.

The number of carton is high ply number it is very much it is hard and strong.

The sea frights depend on dimension of the export carton and the air frights depend on dimension of the export carton or gross weight of the carton.

3.9.2 TYPES OF PACKING

1. Hanger
2. Flat
3. Rolling
4. Master(Blister & Cartoon)

3.9.3 PRECAUTIONARY INFORMATION

1. Ensure no size mistake or mix shade in same carton.
2. No short or over quantity in carton.
3. Carton mark/ shipping mark/ carton sticker should be matched and correct per buyer instruction.
4. Maintain daily report.

3.9.4 IN HOUSE QUALITY SYSTEM

1. Please conduct in house random inspection per AQL 2.5 major and AQL 2.5 minor on daily output, finish and packed quantity.
2. Maintain daily report.

3.9.5 TYPE OF CARTON



Fig: Carton

Depend On Paper	<ol style="list-style-type: none">1. Khaki Carton Or Brown2. Duplex Carton
Depend On Stitching	<ol style="list-style-type: none">1. Stitching Carton2. Now Stitching /Gum Pasting Carton Or Metal Free Carton
Depend On Ply	<ol style="list-style-type: none">1. 3 Ply Carton2. 5 Ply Carton3. 7 Ply Carton

Depend On Liner	<ol style="list-style-type: none">1. Both Side Liner Carton2. Out Side Liner Carton
Depend On Size	<ol style="list-style-type: none">1. Master Carton2. Inner Carton

3.10 QUALITY ASSURANCE SYSTEM

There is hardly any chance of any roll to be passed through production or to any buyers by to by unchecked or disqualified. The inspectors are too much experienced and they are aware of their duties and responsibilities. Factory authority and the production officers are happy and satisfied with their works.

3.10.1 FABRIC ROLL INSPECTION SYSTEM

All rolls are kept in front of the inspection m/c time to time and are inspected over the grey inspection m/c visually in a pre-set speed against light. For any major or minor faults like thick-thin, barre marks, fall out, contamination, fly, holes, oil lines, needle lines, slubs, etc are recorded in grey inspection report to classify the fabric based on the four point system.

Collar & cuff are inspected visually under light box, any major & minor faulty collar/cuff like having wrong ply, hole, needle lines, slubs, wrong design, first line problem etc properly counted and recorded.



Fig: Quality Check of Fabric

3.10.2 QUALITY ASSURANCE PROCEDURE

Based on the sequence of grey inspection, the inspector serially numbers each roll ensuring that all rolls having the knit card with complete details of the roll.

1) After production of fabric rolls of 8 to 25 kg, m/c operators cut them from the cloth or batch roller and they are carried to inspection section by the helpers.

2) Almost four inspection workers are for every shift to check the fabric rolls. For any kind of fault they are checked thoroughly. Skilled inspectors find them and indicate them by the scissors in some cases.

3) Quality is specified on the basis of 4-points system. Here is the point distribution for different kinds fault in this system:-

3.10.3 FOUR POINT GRADING SYSTEM

Size of defects	Penalty
3 inches or less	1 point
Over three inch but not 6 inch	2 point
Over 6 inch but not 9 inch	3 point
Over 9 inch	4 point

QUALITY Pts / per 100 square

meter= (Total point * GSM)/ (Roll weight*10)

Quality inspectors seal on the fabric rolls as 'CHECK-1', 'OK' & 'REJECT' as according as quality classification.

$$\text{points}/100 \text{ yd}^2 = \frac{\text{Total points scored is the roll} \times 36 \times 100}{\text{Fabric width is inches} \times \text{Total yds inspected}}$$

Example: A fabric roll 120 yd long and 48 inch wide:

7 defects up to 3 inch : 2×1 = 2 points

5 defects over 3"upto6 : 5×2 = 10 points

1 defects over 6"upto9" : 1×3 = 3 points

1 defects over 9" : 1×4 = 4 points

Total = 19 points

$$\begin{aligned} \text{points}/100 \text{ yd}^2 &= \frac{19 \times 36 \times 100}{48 \times 120} \\ &= 11.9 \text{ defects points}/100 \text{ yd}^2 \\ &= 12 \text{ points}/100\text{yd}^2 \end{aligned}$$

3.10.4 LIST OF EQUIPMENTS:

In this factory 'STANDARD GROUP.' this is the list of equipments to assure quality:-

- 1) Inspection m/c # 1(For plain single jersey)
- 2) Inspection m/c #2 (For decorative single jersey as like as Lycra, Lacoste, waffle, Fleece and all kind of double jersey as like as Rib, Interlock).
- 3) Scissors
- 4) Weight balance & Micro balance
- 5) GSM cutter
- 6) Seal ('CHECK-1', 'OK', 'REJECT').

3.10.5 REJECTION CRITERIA

Rejection criteria for body & Rib: Following table shows common body & rib faults and response by grey inspection section.

No.	Faults	Response
1.	Needle marks	Major needle line is rejected.
2.	Stripe	Major needle line is rejected.
3.	Barre marks	Rejected
4.	Slobs	1 point
5.	Wrong design	Rejected
6.	Pin holes	1 point
7.	Fly & contamination	Acceptable for color but not for white
8.	Sinker marks	Do
9.	Uneven tension	Discuss with manager
10.	Missing yarn	Use 4 point
11.	Crease line	Do
12.	Uneven tension	Discuss with manager
13.	Oil stripe/line	Do
14.	Thick-thin place	Rejected

Rejection criteria for collar & cuff: Following table shows common collar & cuff faults and response taken by grey inspection section.

No.	Faults	Response
1.	Wrong ply	Reject
2.	Hole	Reject
3.	Needle line	Reject
4.	Slubs	Reject
5.	Wrong design	Reject
6.	Wrong tripping	Reject
7.	Fly & contamination	Acceptable for color but not for white
8.	First round problem	Reject
9.	Uneven tension	Discuss with manager
10.	Missing yarn	Reject
11.	Crease line	Reject
12.	Rust line	Reject
13.	Oil stripe	Reject
14.	Thick-thin	Reject
15.	Wrong tube	Reject

3.10.6 QUALITY STANSDARD

Here is the quality standard:-

- | | |
|-------------------------|-----------------------|
| 1) Fabric width | 7) Broken needle /2'' |
| 2) Fabric length | 8) Thick /thin yarn |
| 4) Slub | 9) Barre/ Stripe |
| 3) Fabric weight | 10) Dirt |
| 5) Hole | 11) Oil |
| 6) Needle / Sinker line | 12) Press off |

3.11 COMPLIANCE

Norban Group is always welcoming in new international standards and compliances measures set by International Agencies as well as our customers. Norban Group maintains a professional culture that abides by an ethics, employee standards, industry standards, and legal compliances. Our business growth is directly transformed into reality within these compliances.

3.11.1 Different compliance issues which they are obeyed:

Admin & HR department:

- **Personnel policies:**

- ❖ Recruitment policy
- ❖ Leave and holiday policy

- **Attendance and leave register card:**

- Their weekly working hour not more than 66 hours including overtime in a week.
- They have the approved manpower list.

Health & hygiene:

- First aid ensures.
- Medicine registers.
- Maternity and pregnancy register.
- Pure drinking water
- Towel for hand dry.

Safety:

- Safety committee
- Firefighting committee
- Rescue committee
- Broken needle register
- Needle detector
- Fire alarm & switch
- Evacuation plan
- Rubber mats to every iron man.

Salary and wages:

- Fix wages in considering minimum wages which is declared by the government. □Salary and wages given before 7th day of month.

Physical security:

- They have separate cargo entrance area (receiving and unloading) from the front side.

They do not keep any partially filled/ completed cartons on the floor at the end of any working day. They keep it to finished goods store.

Education and training program:

They arrange security training program on regular basis for all employee of the factory.

Compliance item:

Some example of compliances item are given below:

- ❖ First aid box
- ❖ Water pot
- ❖ Toilet
- ❖ Wash basin
- ❖ Complain box
- ❖ Evacuation plan
- ❖ Exhaust fan
- ❖ Emergency exit/light/ light set
- ❖ Smoke detector
- ❖ Fire extinguisher
- ❖ Hose cabinet
- ❖ Manila rope
- ❖ Gas musk

3.12 UTILITY SERVICES

3.12.1 Utility Services Available:

- ❖ Electricity
- ❖ Gas
- ❖ Water
- ❖ Steam
- ❖ Compressed air

Capacity & Other Technical Details:

- **Electricity :**

Generally the factory doesn't depend on electricity. They hardly use the government electricity. The electricity is supplied form REB. The electricity supplied in the factory about 4200 KWH. But three standby power generators are also kept to meet the need of electricity if necessary.

- **Gas :**

Gas is mainly used for producing electricity, steam production and also used in generator and boiler. The gas is supplied by TITAS GAS DISTRIBUTION CO. Gas consumption is 3, 20,000 – 3, 30,000 m3 monthly.

3.12.2 Generator Specification

PARAMETERS	Brand name :	
	GENERATOR 1	GENERATOR 2
Brand name	GE Jenbacher	Cummins Power Generation
Origin	Austria	Singapore
Specification	J 320	C250D5

Fuel	Gas Driven	Gas Driven
Power	1064 KW	440 KW
R.P.M	1500	1500
VOLTS.	400	400

3.13 STORE SECTION

This chapter deals with the store of Norban Comtex Ltd. and inventory system of different inventories.

Equipped with modern inventory and storage systems ,the Ware House harvest storage capacity and

ensures stocks of yarns, accessories ,inputs ,packing materials and other materials round the year. Special yarn garments are in place to keep sufficient stock of different counts of yarn stall times to offset occasional or tags of yarn in the international market.

3.13.1 CLASSIFICATION OF STORE SECTION:



3.13.2 DESCRIPTION OF STORAGE

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

- 1) Firstly, store manager gets a yarn &fabric booking shit from the merchandiser as accordance as requirements then he informs or orders other officer about it.
- 2) Then purchase from source with purchase order.
- 3) After when the raw material comes then they also get the received Chelan
- 4) Take weight
- 5) For yarn quality check ,send to the testing section
- 6) Use Bin card to keep record

3.13.3 Grey fabrics store:

All the grey fabrics are stored in the fabric store, near the batch section. Different types of fabrics are listed in the sheet according to the fabric types, quantity & consumer's requirements. Fabrics GSM, shrinkage, diameter & other properties are also taken into consideration. The bathes are prepared by taking the required fabrics from the grey store. At present the grey fabrics store of CCL containing the following types of fabrics-

- ❖ Single jerseys
- ❖ 1 x 1 Rib
- ❖ 2x 2 Rib
- ❖ 2x 1 Rib
- ❖ Fleece
- ❖ Mélange.
- ❖ Pique
- ❖ Single jersey (with lycra attachment)
- ❖ 1 x 1 Rib (with lycra attachment)

3.13.4 DYES & CHEMICALS STORE

There is a different time for dyes & chemicals various types of dyes & chemicals are stored here according to the dyes & chemical company. Different types of dyes & chemicals are listed in a sheet. In the sheet the stored quantity of dyes & chemicals are also included. Every day the sheet is updated & a copy of this sheet is supplied to the AGM (production), Dye house & lab section.

3.13.5 SPARE PARTS

In Norban Comtex Ltd required amount of spares of different machines are stored in the mechanical store room. All the spares are listed in a sheet which is controlled by the mechanical & maintenance personnel. Spares are arranged in the store room according to their size, quantity & requirements. There are shelves in the store room to keep the small spare parts.

3.13.6 FINISHED GOODS

Norban Comtex Ltd supplies its finished dyed fabrics to its garments section. So, dyed finished fabrics are stored for short time in the finishing section. All the delivered fabrics are noted on the tally khata according to the lot no, quantity, fabrics diameter, buyers name, color & considering other technical parameters.

3.13.7 OTHERS

There is a central store at Norban Comtex Ltd In that store the various types of forms, papers; stationary& other necessary goods are kept.

3.14 MAINTENANCE SECTION

Maintenance:

Maintenance is very important department to maintain the production. All activities that maintenance facilities & equipment in good working order that a system perform as intended. Without good Maintenance department, we never achieve the better quality production.

3.14.1 Objective of Maintenance:

- ❖ Maximizing production or increasing facilities availability at the lowest cost and at the highest quality and safety standards.
- ❖ Reducing breakdowns and emergency shutdowns.
- ❖ Optimizing resources utilization.
- ❖ Reducing downtime.
- ❖ Improving spares stock control.
- ❖ Improving equipment efficiency and reducing scrap rate.
- ❖ Minimizing energy usage.
- ❖ Optimizing the useful life of equipment.
- ❖ Providing reliable cost and budgetary control.
- ❖ Identifying and implementing cost reductions.

3.14.2 In The Norban comtex Ltd 2 types of maintenance are done:

- 1. Break down maintenance □ 2. Routine maintenance

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

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

3.14.3 MAINTENANCE PROCEDURE

Preventive maintenance (cutting):

1. Cutting Machine:

Mechanic shall do daily and weekly maintenance of cutting machine as per Maintenance Checklist.

2. Cutting Spreader Lay Machine:

Daily, weekly and monthly maintenance shall be done by Mechanic for this machine.

3. CAD Machine: Daily, weekly and monthly maintenance shall be done by Mechanic for this machine.

4. Button Pulling Machine: Operator shall do daily check and record maintain in Snap Strength Calibration Record.

5. Needle Detector Machine: Operator shall check daily this machine. Supplier Technician shall calibrate this machine once in every 3 (three) months and record maintain in Calibration Report.

3.14.4 Preventive maintenance (sewing):

1. Daily Maintenance:

- ❖ Cleaning the machine head and motor with compressor air, brush and soft fabric.
- ❖ Check the lower knife for sharpness of dull then re-shape.
- ❖ Record Maintain in Preventive Maintenance Plan.

2. Weekly Maintenance:

- ❖ Checking the oil and oil level.
- ❖ Needle bar bush clean.
- ❖ Thread control eyelets checking and clean.
- ❖ Check electric loose connection.
- ❖ Record Maintain in Preventive Maintenance Plan.

3. Monthly Maintenance:

- ❖ Check the condition of V-belt.
- ❖ Oil level, oil condition checking or fill-up, if needed.
- ❖ Check the lubrication control system.
- ❖ Record Maintain in Preventive Maintenance Plan.
- ❖

4. Quarterly Maintenance:

- ❖ Check and adjust needle bar height.
- ❖ Check needle to shuttle relation
- ❖ Check timing, looper, thread com guide tension.
- ❖ Check electric loose connection
- ❖ Needle system and bobbin loose, check according to its operator.
- ❖ Record Maintain in Preventive Maintenance Plan.

5. Half Yearly Maintenance:

- ❖ Record Maintain in Preventive Maintenance Plan.

6. Yearly Maintenance:

- ❖ Changing oil filter, oil.
- ❖ Record Maintain in Preventive Maintenance Plan.

3.14.5 Maintenance Tools & Their Equipment:

The most important maintenance tools that are used frequently are tabulated:

Maintenance Tools	Function
Grease	Lubrication
Tread tape	Joining of broken metallic parts
Cutting disc	For cutting pipes, rods.
Globe valve	Fitting for stem line.
Maintenance Tools	Function
Union	Fittings for water, steam line.
Union elbow	Fittings for water, steam line.
Cutting oil	Lubrication
Gear oil	Lubrication
Hydraulic oil	Lubrication
Oil gun	Oil application
Spanner	Tightening of nut bolts
Master range	Tightening of nut bolts
Flat screwdriver	Screw tightening & loosening
Star screwdriver	Screw tightening & loosening
Hacksaw blade	Cutting
Hacksaw frame	Cutting
Spray gun WP40	Spaying a chemical named WP40 that lubricates bearings.
Drill machine	Drilling to make holes

3.15 MARKETING ACTIVITIES

3.15.1 Marketing Activities:

This chapter deals with the marketing activities, marketing plans, and responsibilities of marketing personnel of Cotton Club BD Ltd.

Manpower:

Marketing plays a vital role in the field of displaying/ showing the good criteria of the products to the buyer & to communication with the buyer. There are about 7 peoples in the marketing section of the industry.

3.15.2 BUYER AND EXPORTING COUNTRY

- C & A, Germany**
- MGB, Germany**
- PRIMARK**
- Center Line**
- Kitaro**
- DEBENHAMS, UK**

3.15.3 Importing countries:

Following countries mainly imports products from CCL through many internationally well recognized buyers.

- ❖ Netherlands
- ❖ Germany
- ❖ Spain
- ❖ Turkey
- ❖ Italy

3.15.4 Product label:

There are following labels used by this mill:

- ❖ Care Label: It contains washing in hot or cold water, chemical cleaning, drying conditions etc.
- ❖ Size Label: It contains size of garments.
- ❖ Composition Label: It contains the fabric composition of different fiber type.
- ❖ Decorative Label: Decoration is as buyer or consumer choice wise.
- ❖ Flag label: it indicates importing country.
- ❖ Barcode label: it indicates hidden identity of product.
- ❖ Price label: it indicates price of product.

Package size & label:

Most common sizes are

S - Small

M - Medium

L - Large

XL - Extra large

XXL - Very very large.

3.15.5 Duties & Responsibilities of Marketing Officer:

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

- To prepare cost sheet by dealing with the buyer.
- To take different steps by discussing with the high officials & merchandisers.
- To maintain a regular & good relationship between commercial officer & merchandisers.
- To maintain a regular communication with the buyer & buying houses.
- Communicate with the new buyers.
Display the better criteria of the products.

]

CHAPTER 4

IMPACT OF INTERNSHIP

4.1 KNITTING SECTION

In Knitting Section we have saw about different types of knitting machine. And also learn machine procedure, count, GSM, Capacity etc.

4.2 DYEING SECTION

In Dyeing Section we have learn about machine describes, different parts of machine, slitter machine, fabric finishing machineries details.

4.3 SEWING SECTION

In sewing section, we practically saw different types of sewing machine. We saw the workers activities, their work culture, time table and their work efficiency which is calculated by their performance.

4.4 MERCHANDISING SECTION

In merchandising we have learnt how to face a buyer and negotiation of a buyer and negotiation of a buyer to convince collect on an order. Analysis of order in the requirements of a buyer and calculate profit and loss of manufacturing of garments. We have learned about CM (cost of manufacturing process).

4.5 FINISHING SECTION

In garments finishing department we have learnt about different types of finishing such as ironing, inspection, tagging, packing etc. After making the garment it gets ironed by steam ironing process. Then it goes to quality check and then tagging packing is done.

4.7 COMPLAINE

In compliance department we saw the activities of the welfare officer and how they trained the workers about their rules and regulations. The welfare officer gives firefighting training which increases the workers knowledge about their safety.

We have learnt about above all matter in our class room. But the practical knowledge what we have got from this internship it will be very helpful for us in future. If we don't get the chance for doing the internship our knowledge will not be good enough for the working field because classroom knowledge is not sufficient and the things which we have learned from this internship it will remain in our memory for a long time.

CHAPTER: 5

CONCLUSION

Norban Comtex Ltd has now established in the world as a manufacturer of reputed fabric and capable of producing value added products and executing difficult orders at very short lead time. The planning, organizing, controlling, designing, creativity, the technical skill and above all the quality conscious have cemented the base of this leading textile industry. With highly advanced technology and an emphasis on developing local human resources, its seems to be clear that Norban Comtex Ltd has the potential to make an important contribution to the nation's growing ready-made garments export sector.