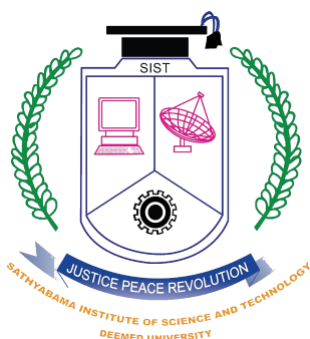


INTERNSHIP REPORT

**SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR
THE AWARD OF
BACHELOR OF SCIENCE – FASHION DESIGN**

By

Sri Saranya. V.M (41105017)



**DEPARTMENT OF FASHION DESIGN
SCHOOL OF BUILDING AND ENVIRONMENT**

SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

Accredited with “A++” by NAAC

JEPPIAAR NAGAR, RAJIV GANDHI SALAI, CHENNAI – 600119

JULY 2023

SCHOOL OF BUILDING AND ENVIRONMENT

DEPARTMENT OF FASHION DESIGN

INTERNSHIP REPORT (S105AINT)

2023-2024

Name of the Student : SRI SARANYA.V.M

Reg No : 41105017

Semester : V

Batch : 2021-2024



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

(DEEMED TO BE UNIVERSITY)

Accredited "A++" Grade by NAAC | 12B Status by UGC | Approved by AICTE

www.sathyabama.ac.in

SCHOOL OF BUILDING AND ENVIRONMENT

DEPARTMENT OF FASHION DESIGN

INTERNSHIP REPORT (S105AINT)

2023 – 2024

VIVA –VOCE EXAMINATION

This is to certify that the Internship (S105AINT) is the work of SRI SARANYA.V.M- 41105017, during semester V, is a student of Fashion Design department had undergone training in SHAHI EXPORTS PVT LTD has been monitored by the continuous assessment during May 2023 to June 2023.

Submitted for Viva Voce examination held on: 06/09/2023

Mentor

Class Coordinator

Internal Examiner

External Examiner

Head of the Department

Head of the Department
Fashion Design
Sathyabama Institute of Science and Technology
3 Chennai-600 119.



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

(DEEMED TO BE UNIVERSITY)

Accredited "A++" Grade by NAAC | 12B Status by UGC | Approved by AICTE

www.sathyabama.ac.in

DECLARATION

I SRI SARANYA.V.M here by declare that the Internship (S105AINT) for 21 days from 11th May2023 to 3rd June 2023 done by me under the guidance of Mr.K.S.Ravisidhaarth , is my original work and is prepared based upon the data and information collected during my internship period is submitted in partial fulfillment of the requirements for the completion of practical training session.

Date: 06/08/2023

Place: CHENNAI

Sri Saranya V.M.

SIGNATURE OF THE CANDIDATE

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to Board of Management of **SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY** for their kind encouragement in doing this Internship and completing it successfully. I am grateful to them.

I convey my thanks to **Dr. DEVYANI GANGOPADHYAY** Dean, School of Building and Environment for providing me necessary support and details at the right time during my internship period.

I express my deep sense of gratitude to **Mrs. S. KRITHIKA** Head of the Department, Department of Fashion Design, School of Building and Environment, for providing me the assistance and knowledge at the right time during the progressive reviews.

I admire, the great opportunity that has provided to us and all the elements that made a contribution toward my understanding throughout this period I would like to extend my sincere gratitude to **Mrs. SWAPNA NARRA** for giving me this wonderful opportunity of an industry internship program.

I would like to express my sincere and deep sense of gratitude to **Mr.K.S. RAVISIDHAARTH** for his valuable guidance, suggestions and constant encouragement. Paved way for the successful completion of my Training.

Last but not the least, I would also like to thank all **MY FAMILY MEMBERS, FRIENDS AND RELATIVES** who shared their support to me during the Internship period.

BONAFIDE CERTIFICATE



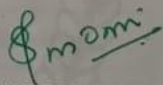
SATHYABAMA
INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)
Accredited "A" Grade by NAAC | 12B Status by UGC | Approved by AICTE
www.sathyabama.ac.in

Ref: SHD/2023/04/24/59 24 April, 2023

BONAFIDE CERTIFICATE

This is to certify that **Ms. SRI SARANYA V M**, Register Number **41105017** is a Bonafide student of our Institution pursuing 2nd year **BACHELOR OF SCIENCE in FASHION DESIGN** during the academic year **2022-2023**. She will be completing the course in the year **2024**.

This certificate is issued for the purpose of **Applying INTERNSHIP**.


DEAN (STUDENT AFFAIRS)
Dr. G. SUNDARI, M.E., Ph.D.,
DEAN (STUDENT AFFAIRS)
SATHYABAMA
INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)
Jeppiaar Nagar, Rajiv Gandhi Salai
Chennai - 600 119.

MAIL REQUEST FROM THE COMPANY

<gayathri.design@sathyabama.ac.in>
wrote:

Dear Sir,
I am N. Gayathri, working as
Assistant Professor in Fashion
Design department of Sathyabama
Institute of science and Technology.
Students pursuing B.Sc. Fashion
Design degree from our department
needs to complete their internship
for 21 days in their Second year as a
part of their curriculum. we request
you to kindly permit our students for
their internship in your esteemed
organization for 21 days from 11th
May to 3rd June 2023. Kindly
confirm your acceptance by mail.

please find attached students name
list with their register number.

Sri Saranya V.M - 41105017

Deepthi. A - 41105002

Nivashini.M - 41105011

Sowmiya.M - 41105016

Best Regards

N. Gayathri
Assistant Professor
Department of Fashion Design
Sathyabama Institute of Science &
Technology
Chennai - 600119

MAIL ACCEPTANCE FROM THE COMPANY

On Mon, 24 Apr, 2023, 3:07 pm T Murali Krishna, <murali.krishna@shahi.co.in> wrote:

Hi Gayathri,

You can send your students on the dates provided below for the internship, please.

Dear Mr. Sudhakar: Please permit the below persons please.

Regards
Murali

On Mon, Apr 24, 2023 at 2:03 PM GAYATHRI N <gayathri.design@sathyabama.ac.in> wrote:

Dear Sir,
I am N. Gayathri, working as Assistant Professor in Fashion Design department of Sathyabama Institute of science and Technology. Students pursuing B.Sc. Fashion Design degree from our department needs to complete their internship for 21 days in their Second year as a part of their curriculum. we request you to kindly permit our students for their internship in your esteemed organization for 21 days from 11th May to 3rd June 2023. Kindly confirm your acceptance by mail.

PERFORMANCE CERTIFICATE

DEPARTMENT OF FASHION DESIGN

INTERNSHIP REPORT 2023

(Continuous progress report of the trainee for the period of 21 days in the industry to be submitted to HOD by the Trainee in Charge the Organization)

1. **Name of the Industry** : Shahi Exports Private limited
2. **Address** : CHM8+75W,IDA Nacharam,Secundrabad,Telangana
3. **Name of the student** : Sri Saranya .V.M
4. **Duration** : 11-05-2023 to 03-06-2023
5. **Total No. of days** : 21 days

Evaluation of performance criteria shall be on

*Note: Kindly grade the student as per her overall performance in the office during the assessment days, which will be converted to the allotted 40 marks by the department.

Description of works	Excellent	Good	Fair	Poor	NA
Understanding of the departments	✓				
Participation in the industry	✓				
Handling the given work	✓				
Punctuality	✓				
Coordination With Other Workers	✓				
Oral communication	✓				
Attitude	✓				
OVERALL PERFORMANCE	Very good				

Any other Remarks_____ Nil

CERTIFICATE

SHAHI EXPORTS PVT. LTD.

Regd. Office : F-88 Okhla Industrial Area, Phase-I, New Delhi - 110020
CIN-U18101DL2005PTC138730

Date:03.06.2023

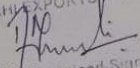
TO WHOM IT MAY CONCERN

This is to certify that SRI SARANYA VM from Satyabhama Institute of Science & Technology had under gone internship at our organization I.e., (11/05/2023 to 03/06/2023) duration of three weeks.

Her internship activity includes familiarization to all the departments and there operations and processes with the production process of the company.

She had majorly involved in an activity of complete "Production Process from Pre Production to Shipment ", During the period of her internship program with us she had been exposed to different process was found punctual, hardworking and inquisitive. We wish her every success in her life and career.

For SHAHI EXPORTS PVT LTD


T MURALI KRISHNA
GM - OPERATIONS

Correspondence Address:

Plot No. A- 7/3, Road No 12, Mini Apparel Park,
Nacharam, Hyderabad - 500076, Telangana, India

Telephone No:

+91 040-27150910, 27170960, 27170970

E-Mail:

delhi@shahi.co.in

INTERNSHIP DETAILS

1. INDUSTRY / ORGANIZATION: SHAHI EXPORTS

Mentor Name : Mrs. Swapna Narra

Designation of the mentor: Assistant General Manager

Contact Number : 040 2717 0960

Address : Nacharam Road Number 12, Industrial Development Area, Nacharam Secunderabad, Telangana 500076.

2. INSTITUTION: SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY

Mentor Name : Mr.K.S. Ravisidhaarth

Designation of the mentor : Assistant Professor

Student Name : Sri Saranya .V.M

Department : Fashion Design

**Address : Jeppiaar Nagar, Rajiv Gandhi Salai,
Chennai- 600119 Tamil Nadu, INDIA.**

DAILY REPORT

DATE	REPORT
11/5/2023	Fabric Department.
12/5/2023	Fabric Department
13/5/2023	Store Department
15/5/2023	Industrial Engineering
16/5/2023	Industrial Engineering
17/5/2023	Cad Department & Training Department
18/5/2023	Sampling Department
19/5/2023	PPC Department
20/5/2023	Cutting and Spreading Department
22/5/2023	Quality Department
23/5/2023	Sewing Department
24/5/2023	Sewing Department
25/5/2023	Sewing Department
26/5/2023	Finishing Department
27/5/2023	Finishing Department
29/5/2023	Washing Department
30/5/2023	Packing Department
31/6/2023	Packing Department
01/6/2023	Visiting all the department
02/6/2023	Visiting all the department
03/6/2023	Visiting all the department

INDEX

S.NO.	CONTENT	PG.NO
1	Company Profile	15
2	Fabric Department	18
3	PPC Department	37
4	Store Department	37
5	Store department contains	42
6	Sampling Department	43
7	CAD Department	48
8	Spreading and cutting	51
9	Industrial Engineering Department	56
10	Numbering and bundling	63
11	Production Department	65
12	Finishing Department	68
13	Washing Department	75
14	Quality Department	79
15	Packing Department	82
16	Conclusion	88

ABSTRACT

The report is on garment manufacturing process in Shahi exports, Hyderabad. This report is made on practical knowledge on how garment is made, what are the procedure followed etc. This report is made by observing, discussing with related people, taking information from files analysis standard of shahi. In this report I discussed about different departments in garment industry, how department are interrelated and what is the work flow etc. I hope this report gives a complete information on garment manufacturing.

1. COMPANY PROFILE

1.1. Introduction to the Holding Company:

Shahi Exports Pvt Ltd.

Shahi is India's largest Apparel Manufacturer and exporter, operating 65 state-of-the-art manufacturing facilities and 3 textile mills across 10 Indian States. Established in 1974 by Mrs. Saria Abuja, Shahi directly employs over 113,000 people, 77,000 of whom are women.

Delivering products across Women's, Men's, and Kids wear, their vertically integrated Operations, diversified product range, and a strong commitment to sustainable operations have Established Shahi as one of the most preferred garment manufacturers in the World.

Shahi is people focused Business with an emphasis on promoting and advancing ethical Working practices across the industry. They are also committed to continuous improvement of Environmental footprint across all of the operations.

They hold a wide range of accreditation and certifications and are proud to be trusted supplier to many of the world's leading apparel retailers including C&A, Calvin Klein, Columbia.

Sportswear, GAP Inc., H&M, Inditex, Kohl's, Marks & Spencer, PVH, Union, Walmart, and Many more.

1.2. ACHIEVEMENTS OF SHAHI EXPORTS:

➤ **GLOBAL PRESENCE:** Shahi Exports has established

Manufacturing units in multiple states of India, including Delhi, Haryana, Uttar Pradesh, Tamil Nadu, Karnataka, and Andhra Pradesh.

➤ **LARGE WORKFORCE:** Shahi company worked over 55,000 employees, Shahi Exports is one of the largest Apparel manufacturers in India. Their skilled workforce plays a crucial role in Maintaining high production standards and delivering quality products.

➤ **DIVERSE PRODUCT RANGE:** Shahi Exports including men's and women's apparel, as well as home products. Their diverse product portfolio caters together, To different market segments and customer preferences as well.

➤ **QUALITY RECOGNITION:** The company has been recognized for its commitment to quality. Shahi product standards and has Been ranked as one of the best in Asia by renowned retailers like J.C. Penney.

- **TECHNOLOGICAL ADVANCEMENTS:** Shahi Exports embraces innovation and technology in its manufacturing processes. The company invests in advanced machinery, automation, and digital solutions to enhance efficiency, precision, and productivity.
- **SOCIAL AND ENVIRONMENTAL RESPONSIBILITY:** Shahi Exports places a strong emphasis on Social and environmental responsibility. They have implemented sustainable practices, including water and energy conservation, waste management, and fair labor practices etc.
- **PARTNERSHIPS WITH INTERNATIONAL BRANDS:** Shahi Exports has established successful Partnerships with renowned international brands and retailers. Their collaboration with requirements of prestigious customers.

1.3 AWARDS & ACHIEVEMENTS:

- Shahi exports 'Best performance training' (category B) under DDUGKY by the ministry of rural development of India in 2017.
- Excellence in sustainable and award by H&M in 2014.
- Best supplier – flexibility provided and growth achievement by decathlon in 2014.
- SHAHI top- factory award by cordon performance improvement initiative, Germany in 2014 and 2015.
- Award for resource conservation by Sweden textiles water initiative in 2015.
- Community impact award given by gap Inc in 2015.
- Eco factory Standard achievement award by marks & spencer in 2014 & 2015.
- Shahi has been Awarded higher global exports by apparel export promotion council AEPC in 2008.
- Shahi has been developed a fair product innovation award by Kohl's in 2013.
- Present buyers at Shahi Exports, Hyderabad:



Figure 1 JCPenney



Figure 2 H&M

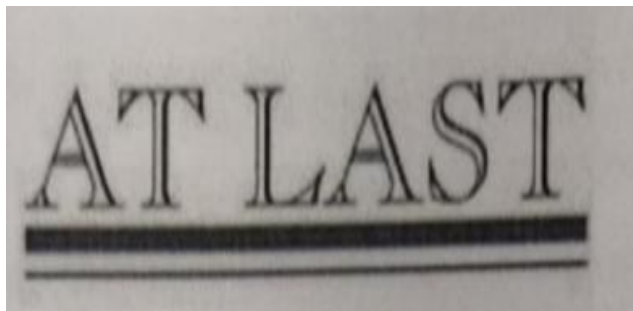


Figure 3 Atlast



Figure 4 Kroger



Figure 5 C&A

2. FABRIC DEPARTMENT

Fabric Shrinkage

Shade variations

Length and width

Fabric Checking

- up to 3in - 1 Point
- up to 6 in 2 Points
- up to 9in 3 Points
- Over 9 in- 4 Points
- UP TO 3 IN 1 POINTS

2.1 ACCEPTENCE LEVEL

- Greige Fabric`
- 20 points per 100 sqmts
- MILL Made Fabrics
- 25 Points per 100 sqmts
- Power loom fabrics
- 44 points per 100 smuts

2.2 SHRINKAGE:

- Using template, mark 50cm×50cm on fabric and mention roll no, meterage and Grain²³ line
- Overlock should be done in all the size of the tested fabric
- Wash the fabric with the approval wash receipt
- Steam the washed swatch after relaxation is to be done minimum for an hour
- measured with measurement scale at the 4 sides and updated the average of three reports into the system.
- more than +/-3% Shrinkage in 10% rolls(+/-5%) for rayon, above that reprocessing
- Variations more than 2%



Figure 6 Point inspection

- If the Shrinkage fails in above criteria than production/ Sourcing/ Merchandising may take collective call outs of required.
- For Shrinkage, a swatch of 25" is cut (10% rolls will be inspected. In case of other fabrics such as Rayon, Denim, 100% rolls will be inspected).
- These swatches are given at the shrinkage table. The swatch is cut as per the Shrinkage template of 50 cm x 50 cm. Marking on the swatches at 35 cm x 35 cm along the side's intersection is done.
- Every swatch is mentioned by the Item No, Roll No., and Display Quantity and will be sent to washing.
- Washing followed by steaming is performed. After this whole process, the Shrinkage/Elongation is measured which is updated in the system and then the Percentage is calculated.
- The shrinkage report is prepared.
- Acceptance level for Shrinkage- 3%

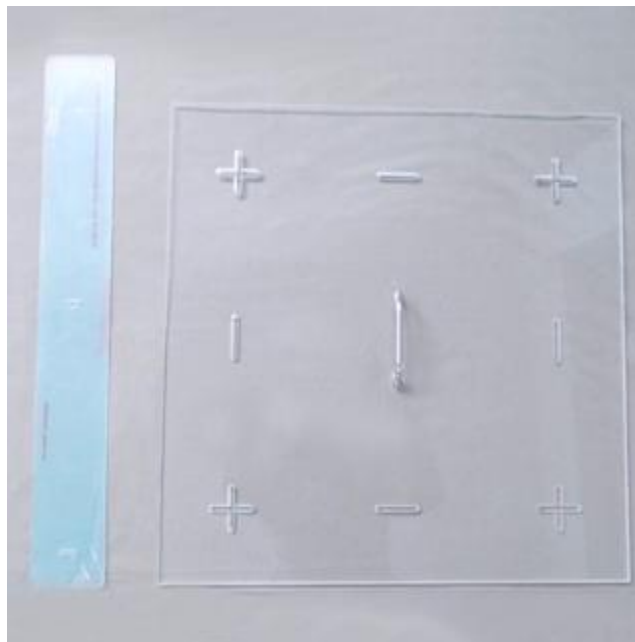


Figure 7 Shrinkage Template

2.3 FABRIC SHADE VARIATIONS:

- From textiles person the textile sheet will be sent to company with label in fabric with variations of shades A,B,C,D

- After in company they make fabric shade Contamination board for reference
- For fabric defects checking process will be in mannualy

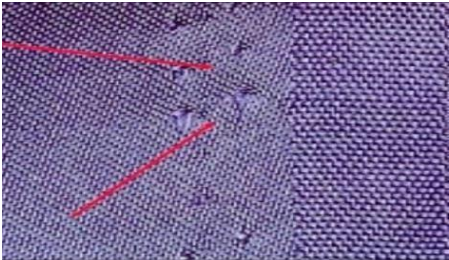
Form of shade variations in garments

Shade variation in the fabric may appear as within same fabric roll, there may be shade variation like 'Centre to selvedge (CSV)' and 'salvage to salvage'

Within same fabric roll lengthwise shade variation

2.4 FABRIC DEFECTS:

Miss print	 Figure 8 Miss Print Defect
Design Out	 Figure 9 Design Out Defect
Miss Yarn	 Figure 10 Miss Yarn Defect

Shade variations	 Figure 11 Shade Variations Defects
Contamination	 Figure 12 Contamination Defects
Hole	 Figure 13 Hole Defects
Time mark	 Figure 14 Time Mark
Distortion	 Figure 15 Distortion Defects

Slubs	 Figure 16 Slubs Defects
Stop Mark	 Figure 17 Stop Mark Defect
Thick Yarn	 Figure 18 Thick Yarn Defects
Lace Damaged	 Figure 19 Lace Damaged Defects
Embroidery Placement	 Figure 20 Embroidery Placement

Miss Embroidery



Figure 21 Miss Embroidery Defects

2.5 SHADE VARIATION IN FABRIC ROLLS

Shade variation in garments (between different components of the same garment) can be controlled if an SOP is set and employees follow that SOP to reduce shade variation in garments. From fabric inspection to garment finishing in each step, you have to be pro-active and take action to prevent shade variation in finished garments.

Considering that you can't do much in fabric quality. In such situation how to eliminate or reduce shade variation in garments , in this article I will show you step by step guides and give you tips to eliminate or at least you can reduce shade variation in garment production.



Figure 22 Shade Variation Roll

2.6 TIPS TO REDUCE AND CONTROL SHADE VARIATION IN GARMENTS:

You can follow the below tips to reduce shade variations in garment panels:

Fabric inspection: Whether it is in-house dyeing or dyed fabric from outside processors, all fabric rolls need to inspect for shade variation. Categorize fabric rolls based on fabric shades. If there

is a wide range of shade variation and fabric shade being out of the standard one, you can reject that lot and sent back rejected to your fabric processors for re-processing.

Preparing Shade band: Develop shade bands and get approval for all shade bands you have in your bulk fabric. Mark shade band no. to each fabric roll / than. Shade bands help in fabric layering and shorting in cutting room.

- Communicate with clear information:

When you have an order with varied shades of fabrics, information must be shared with cutting department as well as production department. While issuing fabric to cutting, intimate cutting department that fabric has different shades and fabric lots should not be get mixed.

- Fabric layering-As advised in point:

You have to categorize rolls according to shade band. While spreading fabrics for cutting, spread fabrics of same shade band no. in a lay. Don't mix fabrics roll of different shades. When you need to spread fabric of another shade on the same lay place separator to identify cutting of different rolls easily at the time of shorting and bundling.

- Marker placement:

In case fabric has shade variation of 'center to selvage' and 'side to side' place garment pattern on the fabric layer in such a way that shade variation would not be prominent (visible) in garment. Like you can set markers as 'one garment one side' and 'side to side' marker⁴

- Numbering of layers:

Use ply numbering system and number all garment components. Like, all components of a garment should have same sequence number. In case you spread fabrics of multiple lots in a same lay (cut) use separator for each rolls/ lot. Then while you make bundles make separate bundles for each lots/roll

- Bundle movement in sewing:

After following above steps strictly, one even has shade variation in garment if bundles are not maintained in sewing lines. Sewing operators need to close bundles after completing

sewing of a bundle. Ensure that when operators join two components, they should check plynumber on sticker and sew component with same ply numbers.

- Replace defective garment part:

Check garment component shade variation at the end of line inspection (at the end of sewing process). Garments found with fabric shade variation (varied shade of different components if that is not a design feature) need to be separated from the good garments. Later defective garments (due to shade variation) can be corrected by replacing parts. For the part changing, be careful to cut parts from the matching lots.

- Single piece garment bundling:

If you can't stop ply mixing in sewing you can introduce a single piece bundle system in production. In this system, there is no way to sew garment components from different fabric plies. I am not suggesting you change your bundling system but just showing you an option for getting rid of shade variation problem in finished garments.

Above steps are not difficult to implement in garment production. Try it yourself and share with us how you have improved and handled the shade variation issue in your factory.

2.7 APPROVAL FOR FABRIC:

- The reference fabric with approval by the buyer will be referred and compared with the fabric which able to process. Swatch should be in 10"×10" or 25"×25"

ROLL TICKET (Bar Code) Sticker

BASE PARAMETERS:

- Supplier Name
- Fabric Mill
- Fabric Description
- Fabric Content
- Colour Standard Name and No.
- Roll Number
- Roll Length
- Cut table width
- Production and Shade

2.8 INSPECTION EQUIPMENT:

- Flat view area table
- Lighting 1075 Lux min
- Meter/ yardage counters

2.9 INSPECTION PROCEDURE:

- If we received above 1000 meters, we have to check 10% of the fabric
- If we received less than 1000 Meters, we need to check 100% of the fabric
- Supplier should check 100% of the fabric before dispatch
- they should dispatch with proper documentation (Quality Report)
- 4 points system
- Fabric rolls are opened and passed through a fabric checking machine having the light under the fabric and the fabric checker does the visual inspection of the fabric.
- While checking fabric checker marks the defects with a chalk or put a sticker on the defects.
- The 4 Point system assigns 1,2,3,4 penalty points according to the size and significance of the defects. No more than 4 penalty points can be assigned for any single defect.
- Defect can be either length or width direction the system remains the same, only major defects are considered.

2.10 COLOUR CONTINUITY:

Colour continuity is to prepare the sample fabric on to another:-

CSV – Centre of Selvage variations

Swatch for shrinkage should in 25”with -10%

LWV -Length wise shade variations should check in

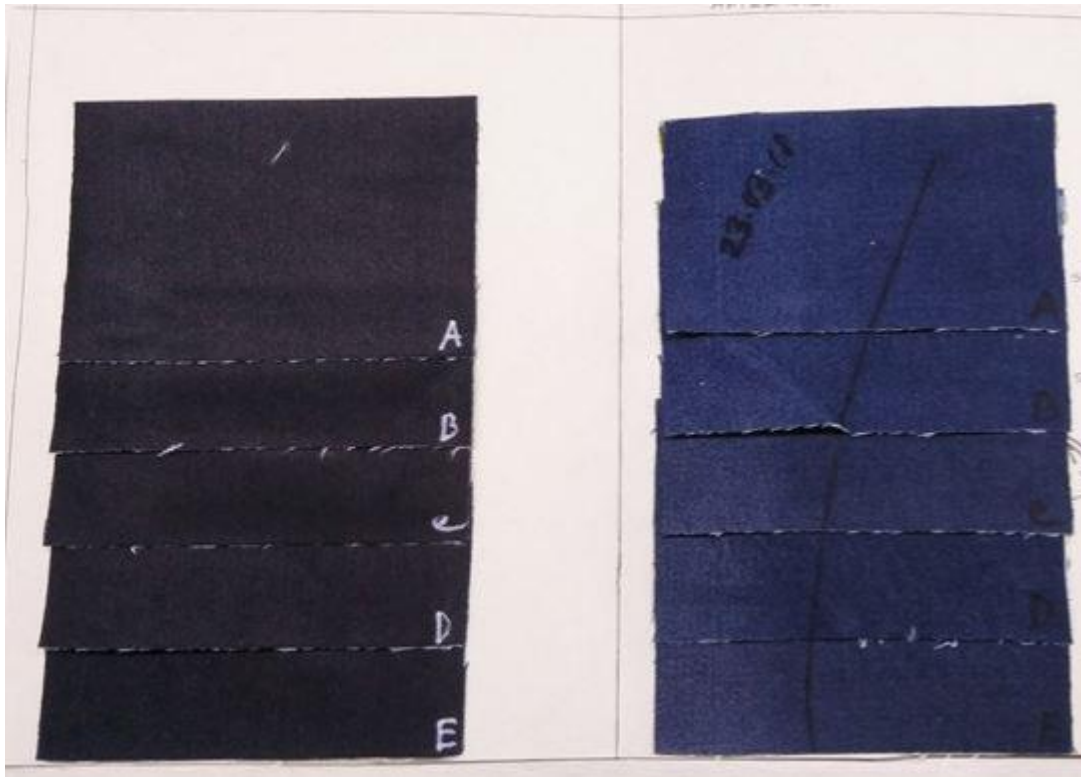


Figure 23 Color Continuity Card

1st meter

3rd meter

5th meter

Should attach 4 swatches so that we can find the variation between the fabric that LWV

2.11 BOWING AND SKEWING:

Bowing is a common fabric defect in woven fabrications where weft or filling yarns are displaced from a line which needs to be perpendicular to the selvedge and lie in a wave or arc across the width of the fabric.

It will be manually checking process.(Bow Department)

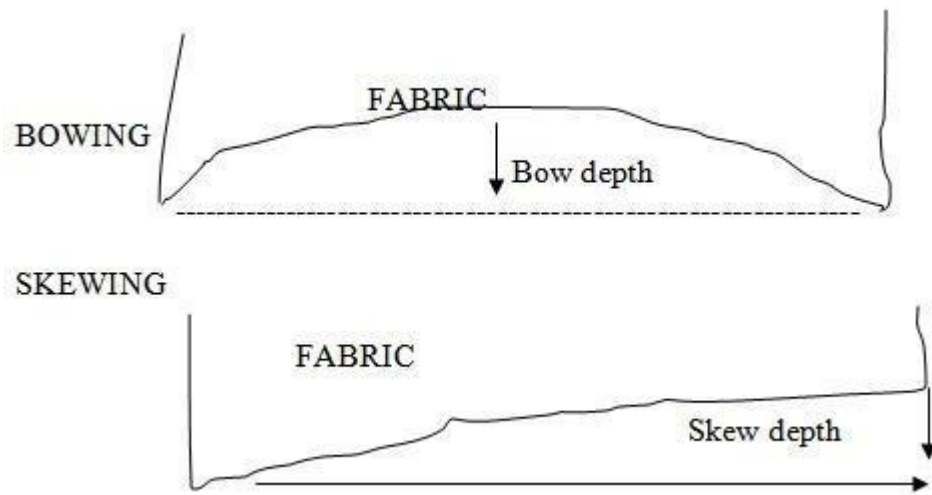


Figure 24 Bowing Skewing

2.12 SKEWING:

Skewing is a common fabric defect in woven fabrications where weft or filling yarns are distorted means pattern on one side of the fabric is ahead or behind the pattern on the opposite side.

This is usually caused in fabric weaving or processing when both fabric edge will be pushed by roller with different force. So due to the difference in force at each edge cause the movement of weft pattern. Lighter the fabric in weight (gem) more chances of skewing and heavier the fabric in weight (gem) fewer chances of skewing will be there.

Finer the yarn count (Indirect system) more chances of skewing and coarser the yarn count then fewer chances of skewing will be there.(Skew Depth)

CALCULATION:

$$\frac{A}{\text{Cut table width}} \times 100 = \text{Max\%}$$

TOLERANCE:

FABRICATION	WOVENS	KNITS
Solid Colors	3%	5%
Strips/Yarns	3%	5%

Dyes	3%	5%
Prints	3%	5%

2.13 DEFTECS & TOLERANCE:

Points Calculations:-

Standard formula

$$\text{Points /100yd}^2 = \frac{\text{Points} \times 3600}{(\text{Cut table width in inches} \times \text{yards inspected})}$$

$$\text{Points 100 Sq yard} = (\text{Points} \times \text{gem} \times \text{actual width} \times 0.1843)$$

$$\text{Actual poundage of roll} \times \text{cut table width}$$

2.14 ACCEPTENCE POINT COUNT:

Group No	Fabrication	Points Max Points Roll	Per 100 yd ² Max Points Per Shipments
I	Dress shirting (>50's) worsted fabric	15	12
II	Woven shirting (<50's) woven synthetic twill tailored switched	20	15
III	Basic knits, Special knits, Flannel, Chamois, Corduroy, velvet, Fleece, French terry wobbly, Jacquard rayon, Challis.	25	20
IV	Linen, Linen blends slob jersey, Silk India power loom	30	25

2.15 PROCESS IN FABRIC DEPARTMENT

MAIN CHECKING PROCESS

- Shade
- Shrinkage
- Visual Inspection
- Side Fabric, printed should checking, CSV, LSV.
- GSM- Common

2.16 FABRIC INSPECTION REPORT:

- Inspection Date
- Fabric PO – (Purchase Order)
- Fabric Supplier
- Fabric Mill Reference
- Garment Supplier
- Fabric Description
- Colour Name
- Shade
- Total points in roll
- Points /100yd²
- Results pass or fail
- Total yards inspected
- Dye lot number
- Roll number
- Roll Length
 - Ticketed
 - Actual
- Bowing and Skewing

2.17 FABRIC CHECKING MACHINE: (Meters)

- This will also measure the meter in fabric
- Also check the defects in the fabric buy using lights, Fabric Inspection Machines can be used to inspect various fabric types such as woven fabric, knitted fabric and other kinds of fabric, and in any fabric state (roll/plaited/A-frame to roll/plaited/A-frame). SUNTECH Fabric Inspection Machines also provide customization for customer's requirements, Fabric inspection machines are used to inspect fabric materials in order to find manufacturing defects(weave), mechanical defects (holes) and dirty spots. For convenience of operator inspection machines have an illuminated panel, under the material.

Printed - 5 mar per minute

YID checks - 10 mar minute

Solid - 10 mar per

minuteCerise - 20 mar per

Minute

GSM WEIGHT MACHINE:



Figure 24 GSM Weight Machine

Fabric will be cutter has 5 samples from all shades A, B, C, D each sample from all shades fabric for hecking GSM

Sample should be in 5×5", in sample each should be mentioned T-Taka with No. & GSM.

5 samples should be taken from every taka

Washed and Non- washed

GSM stands for grams per square meter, which refers to the weight of a fabric. In general, the higher a fabric's GSM, the thicker and more hard-wearing it's likely to be.

a) GSM is known as one of the popular methods to determine the weight of different kind of packaging materials. With the help of the GSM machine, you will be able to test the weight materials like knitting fabrics, paper cardboards, and non-woven fabrics. This can all be done with the help of gem methods.

b) Hydraulic GSM cutters are used to determine accurately the GSM (Grams per square meter) of any type of fabrics. Also known as Round GSM cutter, Machine, Equipment, Instrument for paper, card board, fabric, textile, rubber sheet, etc.

c)Thin curtain fabrics have a GSM of around 140. The heavier the material is, the denser it will be which means it will block out lighter and insulate the room better.

d)As stated above, a higher GSM number means a heavier and thicker fabric, and a lower number means a lighter and thinner fabric. For example, 400gsm (grams per square meter) refers to an average thickness, while 160gsm refers to something slightly thinner than average.

- Cut 5 swatches from the different places of the fabric.
- Weight all test swatches accurately and calculate the average weight of swatches.

- Multiply the average weight of swatches by 100 to calculate the GSM of the sample fabric. (Normally, the area of round GSM cutter is 1/100 square meters.)

GSM test is a measurement of Grams per Square Meter, and is one of the most important methods of determining the weights of knitting fabric, non-woven fabric or paper cardboard.

GSM FABRIC CUTTING MACHINE:

The GSM Cutter is a textile testing machine that uses a weighing scale and a GSM pad to determine fabric GSM. This fabric sample cutter helps to evaluate the product quality by cutting the specimen in a circular shape. If the specimen will be cut precisely, then you will be able to get highly accurate testing results. GSM Testing Machine is used to conveniently calculate (grams / square Meter) of any kind of fabric. GSM Testing consists of 2 instruments combination:

1. GSM CUTTER: GSM Cutter is used to cut the fabric sample into exactly 100 Square cm piece as per Standards.



Figure 25 GSM Fabric Cutting Machine

BILL OF MATERIALS

Fabrication

Types of Fabric used.

Trims

- Stitching Thread
- Buttons
- Elastic etc.,

Processing

Packaging & Labeling

- Main Label
- CPSIA Label

Ticketing

- Barcode Language

Hangers

Sizes

Measurement work sheet – Graded

Sourcing Configuration Discussion

Sample worksheet

Fit image

- Marker
- Fabric
- Quality
- Conduction

Trims

Trim card

Fabric Sample

Lace/Tape

Zipper

Buttons other

2.18 FUSING:

FPT/GPT

Fabric Processing Test Report

- Flammability of clothing
- Fiber Content Analysis
- Fabric counts of woven fabric
- Fabric weight
- Dimensional changes of fabric after home laundry.(Length wise, Width wise)
- Towing strength – Warp, Weft.
- Breeding Strength of textiles
- Sewer from home laundry
- Resistance to slippage of yarns.
- Colour fastness to crocking (Costing- Dry wet)
- Colour fastness to crocking Perspiration
- Colour fastness to crocking Laundry
- Colour fastness to crocking Light
- Appearance after care
- Quick method for color fastness to non- Chlorine bleach
- Quick method for

-OB

Shrinkage, CSV, Shade

3 sample should be taken from the new bundle fabric

for testing washing sample Shrinkage sample 50cm× 50cm

•In garment and textile testing, GPT stands for Garment Package Test and FPT stands for Fabric Package Test. Each buyer sets guidelines for what all tests are mandatory at fabric stage and subsequent in garment stage.

2.19 FABRIC RELAXATION

- Select the fabric rolls based on priority as instructed by the supervisor
- Remove the poly cover on the roll with scissor
- keep the fabric rolls on the feed rollers
- Threading
- Align the ply
- Fix the speed of the unwinding machine according to the roll weight, type of fabric
- Switch on the machine, let the fabric unroll/ unwind in machine
- Dispose the paper tubes in the buns provided put the relaxation for released roll with the information roll number/ Bale number, meters, relaxation start & end time, width, shade & Shrinkage
- Fabric relaxation refers to fabrics that have been relaxed from their roll-type tie.
- Relaxation is critical for obtaining the fabric's form, and garment sizes are dependent on the fabric's behavior.
- In this process, fabrics must be kept relaxed from opening the cover and tied in the cutting room at room temperature.
- The reason we relax fabric is to ensure that there are no measurement issues after cutting .



Figure 26 Fabric Relaxation Machine

2.20 CS Swatch

1. For CS watches, roll head cutting of 8" width is done

2. Marking on the fabric for torsion into 5 parts is done
3. Numbering on the middle bottom position on back side of panels Cutting into the components
5. Placing the system generated stickers on all the 5 panels the sticker Contains information about roll no, GRN no, etc.,
6. Placing the panels in the sequence 41352 and stitching to review the maximum variation across width
7. Ensure that the face side of fabric is upwards
8. The criteria for classification are as follows:
 - a. Grey Scale rating 5: OK (normal marker in cutting
 - b. Grey scale rating 4/5 semi-CSV marker
 - c. Grey scale rating 4 major CSV (use special CSV marker)
 - d. Cannot be rated through grey scale (rejected

3.PRODUCTION PLANNING AND CONTROL DEPARTMENT

In the garment manufacturing sector, production and control (PPC) is responsible for making sure that supplies and machinery are accessible when needed and that operations go without a hitch. Additionally, they collaborate with all relevant departments to guarantee that the item is delivered on schedule. OCR (Order)delivery Order Completion Reports (OCR s) are closed within the allotted time frame following shipping.

4. STORE DEPARTMENT

Head office is in Delhi, all materials which used for stitching is required in store, buyer will be fixed the label, trimmings that use.

Threads – Earthman

Buttons

Elastics – Redwood product, Thu lip elastics, Pares narrow.

Item style will be noticed – 928J, all garments will be related to kids,

If the thread is in other color that was related to the color which approved by buyer the trims will be returned to the supplier

SUPPLY CHAIN:

File

Pattern

Seal SUB,

LOT

QA Folder

Red Tag – Sample

Fabric

Want

Consumption

- If the trims materials are not received before cutting is may be issued for store management.
- If the mistake by the supplier side there will be no issues for store department.

4.1 CHECK LIST OF ACCESSORIES AND TRIMS:

TRIMS	CHECK POINT
Wash Care Label	Wash instruction, language, Care symbols, Supplier number, Label Size, Material Quality
Buttons	Material Quality Ligneous(Size), Number of holes, Colour matching, Colour fastness on contrast Colour design.
Other Label	Label color, Material Quality.
Shoulder Tap	Tape stability material quality, Mobil a tape(check heat proof) strechability, relaxation tearing strength.
Swift Tags	Order number, Style number, SKU number, Bar code number, Scanner Reading, Price, Country code size, Material Colour and Sticker on card quality.
Neck Tape/ Binding	Fabric quality, Colour matching, Colour fastness, Rubbing on Contrast, width.

Ornamental/Embroidery	Embroidery Thread color, Shade number/Counts, Ply/does matching with art work color fastness, Rubbing on Contrast.
Interlining	Material/quality, fusing fix ability based on temp, pressure & gumming, Colour.
Poly bag	Size width length quality, Gauge warning instruction & any instructions given by the buyer.
Poly bag stickers	Order number, Style number, Scanner, Reading, Price Country Code, Size, Material Colour & Sticker on carnal quality.
Hangers	Hanger size, Material Quality, Colour.
Hangers size clip	Size& color, Material Quality
Carton	Number of plies, Garn, gumming atcomes, Busting Strength.
Sniff tags	Brand name, color & Material Quality.
Main Label	Letter color, Language, label code no., supplier number, Material Quality.
Sticker / UPC tags	Order number, Style number, SKU number, barcode number, Scanner reading, Price , Country Code Size, Material Colour and Sticker.
Shapes/ Grippers	Colour matching, Material Colour fastness, after attaching presser, size material quality, Pull test.

4.2 Trims

The raw materials used in sewing room other than fabric are called Trims. On the other hand, materials are directly attached to the fabric to make a garment are called trims. Like: Threads, buttons, lining, Interlining, zippers, labels, care labels, etc.(Interlining is used as shape forming/preserving materials.)

Labels, Buttons, Zippers, Padding, Interlining, Down, Elastic, Thread, Twill Tape, Stopper, String/Draw Cord, Piping Cord, Emblem, Logo Print, Swivel Hook, Eyelet/ Grommet, Collar Stay, Cord Bell, Buckle, Rivet, Weaving Belt, Hook and Eye, Velcro Tape, Seam Sealing tape, Shoulder pad, Cable (steel ware), Adjuster, Recon, Elastic Threads, Shoulder Tape

4.3 ACCESSORIES

The materials, which are used to make a garment attractive for sale and packing, other than fabrics and trims, are called Accessories.

Polybag, Elastic bag, Mini Polybag, Master, Carton, Inner Carton, Size Clip, P.P.Band, Tag Pin, Brass Pin, Collar Stand, Safety, Pin, Gum Tape, Arrow Sticker, Scotch Tape, Barcode, Defect, Indicator, Tissue Paper, Backboard, Neck Board, Butterfly, Numbering Stickers, Hanger, Size Stickers, Carton Pad, Both Side, Tape, Plastic Staple, Iron Seal, Clip, Ball chain, Size Tag, Carton Sticker, Safety Sticker, Plastic Clip

4.4 INDOOR AIR QUALITY (IAQ) REQUIREMENT

- Accepted level
- Temperature - <30DegC
- Humidity - 45-65%
- CO₂(Carbon-dioxide) - <1000ppm

4.5 TRIM STORE DEPARTMENT

CONCERNED PERSON ➡ PROCESS FLOW ➡ DOCUMENT

Security Guard store helper Trims & ➡ Accessories ➡ Invoice

Security guard store executive ➡ Verify quality & enter the details of incoming materials
➡ Inward register

Store executive ➡ Incoming materials are stored in specified location in store ➡ Inward register

Store executive ➡ Enter it on the system & Create GRN number ➡ Goods receipt note GRN

Trims QA → Specified Quantity of all items are sent for the lab test → Lab test request form

Trims QA → Lab test report is received from lab and shared with merchant and production → required Lab test report

Trims QA → Bulk trim header in made from representative priced from the bulk → quality Bulk trim header

Trims QA → Sending bulk trim header to concerned merchant → Bulk trim header

Trims QA → After getting approval from covered merchant team for shade/ color & quality → Bulk trim header

Trims QA → Shade grouping is carried out of some trim category, if required → Bulk trim header

4.6 CURRENT BUYER IN SHAHI

JCP/KROGER Product & Approved

Supplier List:

Threads:

- Madura Coats/ Vardhaman yarns

& threads Labels:

- Check point / Nabco industries/ join

labels/ creationSatin tape/ Cord elastic:

- Tindal poly buttons/ Aero enterprises/Gold

star fitments. Mental Ring adjusters:

- Tindal poly buttons

Snap Buttons:

- Good luck fashion

Elastics:

- Tulip elastic/ Pares narrow fabric/ red wood

Smocking:

- Bajaj industries

Price tag :

- Check point – Pac/Nabco industries/every Dennison/Joint tack label

Poly Bag:

- Amman

Hanger :

•For all kids wear they will be maintained hangers for all garments by requirements of buyer, in hanger the SIZERS are attached to hanger to identify the sizes easily

5 STORE DEPARTMENT

CONTAINS

Printed books

Trims buttons, elastic etc.

Colour cello tapes

Numbering sticker

Box files

Long note book

Mock up cards/yellow/pink

Wax pencils

Envelope covers & A4 Folders

Trims card / Carbon papers / Register

Tissue boxes

HR cartridges etc.,

6. SAMPLING DEPARTMENT

In the Sampling Department work is done to see how the product will look when manufactured in bulk and to check if there are any differences in the design that are made according to the requirements of the consumer. Sampling is the stage of development of initial steps of product development.

- If the order is received, a pre-production meeting is conducted.
 - The company receives the sample file and the order details file from the buyer and the Tech-pack is received from the merchant at the head-office.
 - According to the received files and the samples, patterns are developed in the CAD Department of the head-office and they are sent to this unit after completion.
 - Now, the patterns sent and the sample are verified to check whether the components Received and the measurements are appropriate or not.
 - If changes are required in the patterns, they will be sent back to the head-office.
 - The final patterns are verified.
 - All requirements are organized for size-set cutting including fabric meter age.
 - Mock-up samples are produced before and after shrinkage.
 - Size set is prepared as per the tech-pack/style requirements.
 - Size set evaluation is done. If it passes, size set components are discussed in PPM (PreProduction Meeting), and the cutting instructions are communicated to the cutting Department. If it fails, patterns are revised again.
 - Once the patterns are approved, 3 samples are produced for approval from the buyer. One sample is sent to the buyer, one sample is sent to the Head Office, and one sample is for the industry. The sample sent to the buyer is approved, the garment is marked As a Gold Seal Sample and, ready for production.
-
- Necessary arrangements are done in the cutting department for pilot run.
 - Pilot pieces are cut as per the order quantity (100-500 pieces).
 - Review and analysis are performed for the pilot run.
 - If the pilot run is approved, the style is ready for bulk production.

6.1 RED SEAL SAMPLE:

- A sample with a red tag is an identification of a sample that buyer had approved and sealed that particular sample for production.
 - A sealed sample means approved garment construction; approved trims attached to the garment.
 - Receiving a Red tag sample from buyer is the approval for production go-ahead to the factory.
 - Buyers attach coloured tags to approved samples and send back to the suppliers.
 - A buyer uses different color tags for the different sample type, like green tag is used for Size set samples and Red Tag is used for PP samples (Pre-Production sample).
 - Once attached these tags cannot be removed easily from the sample garment Sealed samples
- Sealed sample with Red Tag.
- Tag is attached to a sample (some buyers also include comment sheets) so that suppliers cannot replace sealed sample or can not show any other garments as an approved sample.
 - Tags are attached to sample to ensure that no unapproved sample is referred to in production.
 - Secondly, a Red Tag as shown in the above image helps merchandisers, production team and quality personnel to identify easily the correct sealed sample for production from other samples of the same style.
 - If there is any confusion related to garment construction at the time of production, the production department just refers to the red tag sealed sample.
 - At the time of quality inspection, buyer representative refers to the sealed sample and buyers' comments on that sample.
 - Shipment inspection is done based on the sealed sample.

6.2 GOLD SEAL SAMPLE:

- Once the PP sample is approved by the brand, they are sealed to prevent tampering from the factory and now become the standard for bulk production.
- They are also known as gold-seal samples or red-seal samples, depending on the approval, or disapproval of the brand.

6.3SIZE SET SAMPLE:

- For Size set samples, garments are made in all sizes and send to the buyer.
- The main purpose of Size set sample is to check the factory's capability to make the samples in all sizes.

- Actual fabric and trims are to be used for Size set samples.
- The buyer specifies the number of quantities to be sent for each size.
- If sizes are more in number then buyer may ask to skip some sizes, this is then called Jump Size set sample.
- This sample can be made along with GPT samples.

6.4 PILOT RUN SAMPLE:

- 2-5% of total production quantity is made in the separate sewing line before the actual bulk production.
- The purpose of making these samples is to assure buyer about the actual bulk production capability of the factory.
- The pilot run can be named as a trial production run.
- A pilot run is done after approval of the PP sample and before bulk cutting.
- The pilot run for a style (order) is conducted if the buyer asked for it. Many garment manufacturers set pilot-run as standard procedure.
- In those companies, Pilot run is must for all styles irrespective of buyer requirement.
- Pilot run in garment production Garment manufacturer cut around 100-200 garments per style for the pilot run.
- This production is done based on PP comments. All 200 pieces are treated as mini production.
- Factory follows complete processes planned for the order. Factory sets up stitching line.
- And production for the pilot run is done as it to be done for the bulk production.
- Points to be considered while making pilot run Pilot must be processed in the production line instead of sampling section.
- All sizes and all colors are included in the pilot quantity (factory may cut jump sizes instead of all sizes).
- If pilot run is requested by buyer, quality of the pilot run pieces may be checked by buyer QA Pilot run pieces are included in bulk quantity in finishing and are sent with the shipment (if there is no variation than the buyer quality specification)

6.5 CUTTER:

- Cut size set sample as per instruction given by sampling in charge.

- Responsible to adopt & ensure all safety precautions are adhered as per their job requirements.
- Required to contribute towards environment/health & safety implementation.
- To maintain self discipline in the work area.
- To ensure the cutting is done exactly as per the pattern & unwanted wasted are not generated.
- To make sure that fabric is approved for a particular style.
- To report to supervisor regarding the events that took place while working.

6.6 SAMPLING OPERATOR:

- Stitch the garment as per the instructions of the supervisor to provide the quality garment.
- Follow the instructions given by the QC responsible to adopt & ensure all safety.
- Responsible to adopt & ensure all safety precautions are adhered as per their job requirement.
- Required to contribute towards environment, health & safety implementation from time to time as per instructions displayed as the notice board.
- To maintain the quality is stitching.
- To check the condition of sewing machine & the needle before starting the work.
- To maintain self discipline.
- To maintain housekeeping.
- To report to in charge production/Supervisor regarding any problems raised while sewing.

6.7 ASSISTANT PATTERN MARKER:

- Size verification of size set pattern from HO
- Assist the SR. Executive sampling.
- Issue patterns to sample cutters & Sample operation as per instruction given by SR Executive sampling.
- Approve the hard patterns on all parts with seal & signature before issuing to cutting & sewing department.
- Issue approved patterns to cutting sewing department as per request given by creative.

6.8 SAMPLING SUPERVISOR:

- To ensure that sample is made as per buyer requirement on time.
- Responsible to connecting sampling priority plan along with sample & ticktack.
- Responsible to attending the meeting with dept in charge note down & ensure incorporate the comments.
- Conduct meeting with operator, quality & share the comments & ensure they as incorporate & samples will be at first time.
- Responsible to meet the productivity & delivery as committed with in charge.
- Responsible to ensure team members to carry out the responsibility as per the instructions from department head / factory manager.

6.9 QUANTITY CONTROLLERS:

- Responsible to verify the pattern sample, ticktack & comments against requirements of sample.
- Responsibility to verify the requirements of sizes, color ways & meeting comments.
- Responsibility to verify the cutting panels are as per approved patterns & load time.
- To assist sampling quality in charge in submitting sample on time & achieving first time approval of samples from internal quality team & buyers.
- To contribute towards environment wealth & safety.

6.10 FEEDING HELPERS:

- Provide all the materials in the sample operation from the stone.
- Prepare the production report sample delivery details monthly & daily cutting report.
- To report to in charge production/ supervisor regarding the problems faced.

6.11 DATA ENTRY OPERATORS:

- Updated the production report in the computer.
- Assist the pattern & CAD department in generating the reports.
- Prepare shrinkage report, pattern production report, cutting report, monthly consolidate production report buyer wise & sampling production report date & buyer wise.
- To keep the base up of date for every 3months cycle.

6.12 PRODUCTION SAMPLING FLOW CHART:

- Sample & order file received from OAD / PPC.
- Final pattern received from OAD / PPC.
- All requirements are organized for size set cutting including fabric meter age.
- Size set cutting using received graded pattern with added shrinkage.
- Size set making using as per ticktack/ style requirements.
- Size set comments are discussed in PPM & Cutting instructions are communicated to cutting.
- Necessary arrangements are done in cutting for pilot pieces cutting pilot run cutting & making (100-500) per as per order quantity.
- Review & analysis of pilot run pieces.
- Minor amendments of pattern are carried out due to Shrinkage of required.
- Final revised pattern is authorized & sent to cutting for bulk production.

7. CAD DEPARTMENT

Computer Aided design CAD has been a for designing and manufacturing industry allowing efficiency & productivity which a normal pen paper design.

CAD is a set of software tool compiled in a computer application to assist product designer in creating a virtual representation of the art facts they are designing. It helps in giving dimension to any design, exchanging of data & information related to the data & information related to the design between teams and organization adding progress of the design for further analysis, assisting tool for product manufacturing by means of a computer system which may include both hardware & Software.

- The patterns for all the style along with the grading are sent from the Head Office through Mail.
- The software used for marker making in the CAD department is OPTITEX and all the Changes and updating of the patterns is done in this software.
- The marker is prepared using the patterns received and it is given to the sampling Department for the Size set verification.
- The mock up Samples are prepared to observe Shrinkage and elongation differences of the PP sample and the pattern received.

- The differences in the percentages are updated in the Potties software on the patterns and again size set verification is done.
- All of the details such as, Order quantity, the size and color wise ratio for the order are sent by the buyer to the department after the approval of the sample.
- When the actual fabric quantity for the total order quantity required is equal to the total fabric quantity received, the lay plan ratio is directly prepared and it is simple to Process.
- If the actual fabric quantity required for the total order quantity is less than the received .
- Fabric quantity, the fabric is stored in the fabric store location for the further purpose if required or, it can be used to prepare some extra garments in the order getting approval from the buyer.
- If the actual fabric quantity is greater than the received fabric quantity, the cut plan is Prepared , the available fabric and a request will be sent to the supplier for the Remaining fabric. If the remaining fabric quantity is not available at the supplier and the Shipment is , an approval from the buyer is processed and the order will be closed.
- After preparing the cut plan, a size wise ratio for the lay plan is prepared.
- Considering the ratio to be the highest quantity of the particular size, No. of lays are Prepared.
- The maximum plies that can be considered is 100/120 depending on the fabric types and the no. of lays are prepared by considering the order quantity of the size and no. of Plies.
- After the preparation of the Lay plan, marker making is taken place. The width of the Marker is based on the fabric type and the length is the placement of the graded pattern on the marker.
- Considering the CSV and Non-CSV fabrics, the marker making is done.
- The marker making is done mostly considering the CSV rather than the marker type.
- In case of CSV marker making, all of the patterns of one size are placed together to avoid color variation (It is done regardless of the print type).
- For Non-CSV marker making, automatic marker can be generated.

7.1 BENEFITS OF CAD SOFTWARE:

- Increases in the productivity of the designer.
- Improve the quality of the design.

- Better Communication.
- Creating documentations of the design.
- Simulations.
- Elimination of inventory.
- Considering the CSV and Non-CSV fabrics, the marker making is done.
- The marker making is done mostly considering the CSV rather than the marker type.
- In case of CSV marker making, all of the patterns of one size are placed together to avoid oil color variation (It is done regardless of the print type).
- For Non-CSV marker making, automatic marker can be generated.
- According to CSV & LSV the marker is planned.

7.2 PLOTTER MACHINE _CAD

• Plotters are used for all kinds of construction and MCAD applications, including technical drawings, maps, and renders. Any application that benefits from crisp text and precise lines on a larger, single-sheet output can see value in a large format HP plotter printer.

- Plotter Machine used for printing markers- lay in the sheet for cutting.
- It can made multiple sizes of marker in the sheet.
- The first plotter was created by Remington-Rand in 1953. It was used in combination with the UNIVAC computer to make technical drawings. In the late 1960s and 1970s, Tektronix and Hewlett Packard produced small, desktop-sized flatbed plotters.

• Plotters are specialized pieces of equipment designed to print out vector graphics in a variety of colors. Three types of plotters are most popular for their ability to allow you to create different designs.

• Examples include a printer, monitor, speaker, plotter, etc. A plotter is a type of printer used to print vector graphics. It receives computer data and prints it out on paper. So, it is a device for output.

- The advantages of using a plotter include the following:

Specialized applications.

• Plotters can generate high-resolution line drawing, images, graphics and text for specialized applications, such as printing on large pieces of paper on a flatbed type of printer.

- Variety of material.
- Repetition.

- Quality Plotters are big in size; therefore, they take more space than regular printers.
- Plotter Machine that can be produce accurate drawing markers of objects or 3D models.



Figure 27 Plotter Machine

7.3. MANITENANCE SERVICE CHICK LIST:

DAILY :

- Check wheel pressure.
- Cleaning machine.
- Check Casting

WEEKLY:

- Clean the ribbon.
- Check the sensor.

8. SPREADING & CUTTING DEPARTMENT

8.1 PROCESS FLOW IN CUTTING DEPARTMENT:

- Sample & order file received from OAD/PPC.

- Find pattern received from OAD / PPC.
- PO/ style details & delivery schedule received from production merchant.
- All requirements are organized for size set cutting including fabric meter age.
- Size set cutting using received graded patterns with added shrinkage.
- Size set making using as per ticktack/ style requirement.
- Size set comments are discussed in PPM & Cutting instruction are communicated.
- Daily / weekly cut plan is prepared as per delivery schedule (planning sheet).
- Daily cutting plan is received to coordinate with the cutting.
- Master plan is given to CAD, keeping ratio of order quantity CS & average consumption.
- Fabric inspector report & fabric lot challis received from store for analysis.
- Shade grading fabric lot is style allowed to destination country.
- Shrinkage management per defined color coding is used in for shrinkage as per SOP.
- Fabric relaxation is carried out for fabric i.e., knit & lira fabric.
- Pilot run cutting (100-500) as per order quality.
- Pilot run comments analysis & download to cutting department.
- Bulk cutting approval given by QA development.
- Final revised pattern is authorized.
- Final markers are pegged incorporating.
- Shrinkage fabric CS, amendments etc.
- Final markers are received from CAD.
- marker audit is done.
- Spreading of first lay ply of the layer as per marker specification length, width.
- Spread the marker on first lay/ply.
- Checking of first day and marker pass
- Ready layer chart received online & checked ok.
- Bulk cutting starts.
- Cutting times note & cutting efficiency is monitored.
- End bits management.

- Thickening's numbering sorting, Embroidery required, fusing if requirement, rebutting required.
- Re-assembling of all cutting parts if required.
- Checking of cut parts (Top Mid, Bottom) in approved pattern (min 10% of total layers cut each / day)
- Cutting production has been noted & monitored.

8.2 MAXIMUM QUALITY STANDARDS (LAY HEIGHT)

FABRIC COMPOSITION	LAY HEIGHT
100% Cotton	3½ Inches
100% Viscose	2 Inches
100% Polyester	2½ Inches
Polyester Cotton Blends	3 Inches
Polyester Viscose Blends	3 Inches
Cotton Spandex Blends	3 Inches
Viscose Spandex Blends	3 Inches

8.3 STRAIGHT KNIFE -CUTTING

- Received the lay record from the layer and layer stickers from stitching helpers.
- Ensure marking chalk, straight knife machine, patterns, and lay weight available.
- Place the pattern/ Marker on the lay according to the minus markers plan 2 lay-Record.
- Paste the lay stickers on all the garments parts of marker.
- Cut the part according to the pattern.
- Ensure the notches are marker & the cut edges are smooth.
- Shift the art parts for quality check.
- Cut the block containing the parts cut on the band knife.
- Transfer it to the designated place for band knife.
- Straight knife cutting machine is used to cut components of differing size.
- This is the most frequently used equipment for cutting garments in bulk.

- It is moved along the cut contours, while the fabric spread remains in a fixed position.
- The machines are maneuverable and capable of curvilinear cutting.
- After the pre-production meeting, the sample file, order file and the final patterns are Received from the Production Planning and Control (PPC).
- Merchandising department receives the purchase order details and the delivery Schedules, and gives these details to the spreading and cutting department.
- Fabric relaxation is carried out for the fabrics before spreading and cutting.
- Initially, the lay for pilot run cutting (of 100-500 pcs) is prepared as per the order Quantity.
- From the pilot run, comments are analyses by the PPC team.
- Once the pilot run is approved, the particular style is proceeded to the bulk cutting. Bulk Cutting approval is given by the Quality Assurance (QA) department. If not, necessary Changes/modifications arc done.

Figure 28 Straight Knife Machine



- From the finalized patterns, the cut plan and the marker plan are prepared by the CAD Department incorporating the specifications such as shrinkage, elongation, fabric color Variation, amendments, etc. and given to the Spreading and cutting department.

- Straight knife cutting machine is used to cut components of differing size.
- This is the most frequently used equipment for cutting garments in bulk.
- It is moved along the cut contours, while the fabric spread remains in a fixed position.
- The machines are capable of curvilinear cutting.
- Straight knife cutting machine is used to cut components of differing size. This is the most frequently used equipment for cutting garments in bulk.
- It is moved along the cut contours, while the fabric spread remains in a fixed position.

8.4 BAND KNIFE CUTTING MACHINE:



Figure 29 Band Knife Machine

- Band knife machine is a special cutting device used in sewing and furniture industries, which allows to evenly and accurately cut fabric, upholstery foam or other soft materials used in clothing and furniture industry.
- Dimension of the band knife blade 3860 x 10 x 0,45 mm. Voltage 230V.
- Received the block to be cut with by record.

- Ensure marking chalk, pattern & lay holding champs are available.
- Make sure all the parts to be cut in have to knife have top stickers.

8.5 ADVANTAGE OF BAND KNIFE:

- Very effective than straight knife to cut small pieces of garments.
- Low space required for installation this machine.
- Automatic grinder used to make sharper the edge of knife during cutting.
- Intensity of accident is very low.
- Possible to cut thin layer with 90-degree angle.
- Air blower helps to smoothly handle and cut the fabric layer.
- Only one operator can fully control a machine with fully operational.
- Perfect to cut tiny pieces in lingerie like center front, cradle, wing, gusset etc. & in knit garments collar, placket, pocket, cuff etc.

9. IE (INDUSTRIAL ENGINEERING) DEPARTMENT

$$1. \text{ SAM} = \text{Basic minute} (1 + \text{MD}\% + \text{CI}\% + \text{PF}\%) + \text{B.H}$$

$$= \text{Basic minute} (1 + \text{PF}\% + \text{MD}\% + \text{MD}\% \text{PF}\%) + \text{B.H.T}$$

$$2. \text{ BASIC MINUTE} = \text{Average single cycle time} \times \text{rating}\%$$

$$\text{BASIC MINUTE} = \frac{\text{SAM} - \text{BHT}}{(\text{HPD}\%)(\text{HM1}\%)}$$

$$3. \text{ BUNDLE HANGLING TIME} = \text{Small parts} = 0.024$$

$$= \text{Big parts} = 0.036$$

$$\text{PF}\% = 20\%$$

$$4. \text{ EFFICIENCY} = \frac{\text{Out put}}{\text{Input}} \times 100$$

$$5. \text{ EFFICIENCY} = \frac{\text{Output} \times \text{Sam}}{\text{Working minutes} \times (\text{No. puff operation} + \text{helpers})} \times 100$$

$$6. \text{ TRAGET OUT PUT} = \frac{\text{Target efficiency} \times \text{W.M} \times \text{Strength}}{\text{SAM}} \times 100$$

$$7. \text{ SAM Produced} = \text{No. of pieces produced} \times \text{SAM}$$

$$8. \text{ Working Minutes} = \text{On Standard Time} + \text{off standard time.}$$

$$9. \text{ On standard time} = \text{working minutes} - \text{OFF standard time.}$$

$$10. \text{ Off Standard Time} = \text{Working minutes} - \text{On Standard Time.}$$

$$11. \text{ Target} = \text{Clock Time}$$

$$12. \text{ Performance} = \frac{\text{SAM Produced}}{\text{On standard time}} \times 100$$

$$13. \text{ Utilization} = \frac{\text{On Standard Time}}{\text{Clock Time}} \times 100$$

$$14. \text{ Pieces per machine} = \text{Output} / \text{No of machines}$$

$$15. \text{ W.I.P} = \text{Large operations in parts} + \text{Assembly} \times \text{P.P.M/C}$$

$$16. \text{ W.I.P} = \text{No. Of operations in critical part} \times \text{1Hr WIP}$$

$$17. \text{ No. of workers} = \text{SAM} \times \text{Target} / \text{Line efficiency} \times 480.$$

$$18. \text{ Batch Target} = \text{Workers} \times \text{Line efficiency} \times 480 / \text{SAM.}$$

$$19. \text{ Estimated Actual Time} = \text{SAM} / \text{Target efficiency} \times 100.$$

$$20. \text{ Capacity} = \frac{\text{Basic Minute}}{\text{Average SCT}} \times 100$$

$$21. \text{ Operation per garment} = \frac{\text{SAM}}{\text{Garment} \times \text{estimated Target O / P / Clock Time} \times \text{Estimated efficiency.}}$$

$$22. \text{ LCK} = (2 \times \text{BPT}) - \text{UCT.}$$

$$23. \text{ STD SMV'S} = \text{Button Hole } 0.12.\text{min}$$

Button attach 0.10 min

Key hole attach 0.20 min

Bartack attach 0.08min

9.1 MACHINE DELAY PERCENTAGE:

1. Single needle lock stitch – 12.5
2. Double needle lock stitch – 17.5
3. Single needle edge cutter – 12
4. 3 Thread overlock – 7.5
5. 5 Thread overlock – 9.5
6. Feed or ARM – 9.5
7. 3Thread chain stitch – 10.5
8. 4 Thread chain stitch – 12.5
9. Button hole Chain stitch – 3.5
10. Button hole lock stitch – 5
11. Bar tack – 5
12. Pressing – 2.5
13. Flat lock – 18.5

9.2 IE DEPARTMENT PROCESS FLOW:

- Callouts from central IE / Team / Tentative plan allocation PU's
- Review the samples of any modification as required production will be advised to central R&D team with CST
- Allotment from central planning
- Operation breakup & final approval sample
- Review the OB with final approve Sample, if any deviation informs the central IE / planning.
- Layout simulation/ Machinery Planning / Folders Attachments/ Profiles with finalized.
- Identification of the critical operation if required training will be provided.
- Verification of thread Consumption issued by controlling with final Approved sample
- Allocation of operators / Checkers
- Target fixation according to the SAM as per slab given by the management.
- Planning sheet will be issued to production team.

- MSO for any new / Critical operation to achieve the productivity.
- Batch setting is carried as per the finalized layout.
- Operation cycle time will be scheduled based on the take time of the operations.
- Cycle time analysis & Rust the layout.

9.3 IE – ROLES & RESPONSIBILITY:

Senior executive (IE)

14. To achieve and sustain the monthly sewing efficiency of 75% in the factory.
15. To reduce and arrange in process (WIP) on work Sewing time the factory to diss that WIP in more than 90%, dines.
16. To Support the production floor with line lay-out and the balancing.
17. To maintain the skill matrix of operations.

9.4 IE- DUTIES:

- To work on continuous improvement through new technology, new methods, reliable resources to achieve operations excellence.
- To keep on updating skill matrix by means of time study, capacity of operations which helps the production to improve the production efficiency by proper line balancing and control WIP.
- Checking all the stitches and operations involved in a garment carefully during R&D for smooth production.
- To have good command over English language so that the operations can be well defined & easily understand by all concerned.
- Monitoring all the necessary documents related to sample during R & D keep close eye on customer requirements.
- To keep on working different process involved in the garment manufacturing process by means of the time study & process simplification to boost the product efficiency and right at first time to meet on time delivery.

9.5 OPERATION BULLETINS:

- Operation Bulletins is a summary document of a sewing line.
- In this OB how many machines & workers are required for making the complete garments is listed.
- The machine layout for the operations breakdown of that garment.
- It's a process of the balancing by which we reduce the SMV of making a garment.
- The operation Bulletins also helps to remove the bottleneck of the production line.
- Because we get the proper idea.
- About the machine & worker needed for every operation of a garment.
- Proper format is to be used.
- Study of garments Operation is to be done.
- OB should be sequential
- None of the operations is to be slipped.
- Deviation from actual SAM is to be minimized.
- Operation bulletin may be a vital tool of commercial engineering which is employed to machine layout planning, line balancing, remove the bottleneck
- The total number of worker and helper needed for garment production.
- It's a document where you'll get all sort of information about the assembly procedure.
- Formula: Calculated Machine number = operation SMV / Pitch.

9.6 IE DEPARTMENT DEFECTIVE LIBRARY

- Fabric defects
- Sewing defects
- Visual Defects

PRODUCTIVITY IMPROVEMENT PLANNING:

- ◆ Hourly production of operators and capacity checking.
- ◆ Using the best possible line layout.
- ◆ Scientific workstation layout of lines.

- ◆ Reduced line setting time.
- ◆ Improve line balancing.
- ◆ Used work aids, attachments, guides, correct pressure foots and folders.
- ◆ Continuous feeding to the sewing lines.
- ◆ Sewing operator training program for skill enhancement.
- ◆ C Line supervisor training program.
- ◆ Setting targets for the operators individually.
- ◆ Usage of auto trimming sewing machines.

9.7 IMPORTANCE OF INDUSTRIAL ENGINEERING INDUSTRY:

•The importance of industrial engineering and the need for industrial engineers in garment manufacturing plants can be explained through their activities. If someone asks you what the applications of IE in the garment industry are, you can show them this list. Or read out the following list of activities.

•I would also say that there are some factories that use industrial engineering tools without employing the IE team.

•Garment manufacturers working with international brands/buyers understand the need for industrial engineering. Even many buyers hire industrial engineers for their team.

•Earlier industrial engineers and work-study teams used to make operation bulletins in Excel sheets (most of the garment factories still use Excel spreadsheets), they used to do capacity study and hourly production for line balancing – all these functions are now available in a software application.

•Industrial engineering concepts and application has big impacts in the garment industry primarily in the production areas.

•Setting up the standard working hours for each activity, sewing machines and garments stitching content, and the standard time value is essential for understanding the process flow of a garment item (style).

9.8 APPLICATION OF INDUSTRIAL ENGINEERING :

•Industrial engineering includes tasks like production planning and control; quality control; inventory, equipment, warehouse, and materials management; plant layout; and job and work station design.

- Industrial Engineering is concerned with the design, analysis, and control of production and service operations and systems.
- In the past, an Industrial engineer worked in a manufacturing plant and was involved.
- The operating efficiency of workers and machines.
- Today, industrial engineers are more broadly concerned with productivity and all of the technical problems of production management and control.
- They work in various branches of companies: manufacturing, distribution, transportation, mercantile, and service. Their responsibilities range from the design of unit operations to controlling complete production and service systems.
- They integrate the physical, financial, economic, and human components of such systems to attain specified goals

9.9 THREAD CONSUMPTION

Total thread consumption = $100 \text{ cm} \times 14 = 1400 \text{ cm}$. Estimated Needle Thread (20 %) = $1400 \times 0.20 = 280 \text{ cm}$. Estimated Lopper Thread (80%) = $1400 \times 0.80 = 1120 \text{ cm}$. Add 15% wastage = $1400 \text{ cm} + 15\% = 1610 \text{ cm} = 16.10 \text{ meters}$ of thread per seam. This length may vary depending on the styling, construction, machine types, seam width, SPI, and wastage of thread in sewing. Based on industry data the average stitching thread required in making a t-shirt is 100-110 meters.

1. By measuring the actual amount of thread consumed
2. By calculation using thread consumption ratios.
3. These days, thread consumption and costing can be calculated without the need to pick
4. Thread from seams. Coats' Seam works is a sewing management software solution that can accurately calculate thread consumption and costing for a single sewn product or production
5. Run on any number of sewing machines.
6. Seam works helps to reduce thread wastage and can give you a competitive edge through cost effective sewing thread procurement. Ask your local Coats contact about Seam works.

10. NUMBERING AND BUNDLING

- The bundle of cut components and size wise and small components and the body components are separately in a sequence.
- The cut stack is tied along with the cut sections of the master marker in the bundle along with the layer chart.
- In the sticker, the first 2 digits indicate the shade or lot code, the second 2 digits indicate the size, and the remaining 4 digits indicate the serial number.
- According to the shrinkage-wise color, the sticker is allotted to the layer of the cut Component by the snickering machine
- “Bundling” is the process of disassembling the stacked and cut pieces and reassembling them in production lots grouped by garment unit, color dye lot, and number of garments.

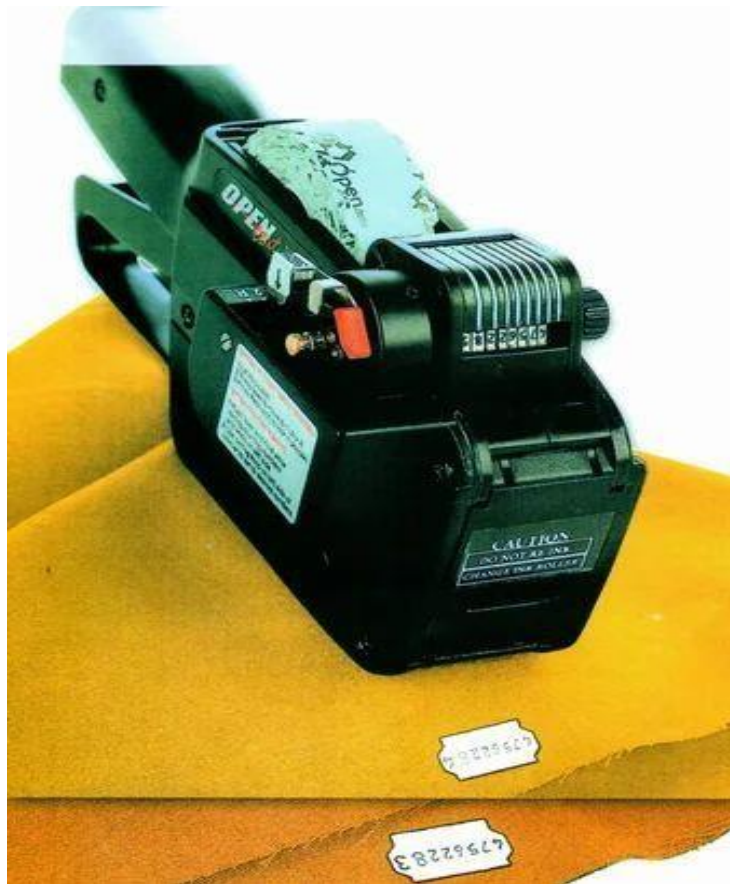


Figure 30 Numbering Machine

10. 1. NUMBERING:

Pasting of number sticker on all components of all the components of garment.

- Pasting of number sticker on all components of all the components of garments.
- Number acts as the identification of garment components of the lot from which garment is cut.
- Number acts as the identification of garment component and the lot from which garment is cut.

BUNDLING: Assembling the cut components in small batches of pre defined number as per the requirements of production system.

- Assembling the cut components in small batches of pre defined number as per the requirements of production system.

10.2 FUSING PROCESS:

- Fusing material is used to fuse a fabric that gives stiffness to the fabric by the application of Pressure, heat, and time. The fabric to be fused should have the acceptable strength, the ability
- To handle the frequent washes, and any other applications.
- fusing is done by continuous fusing machine where the heat is applied from both sides of fabric.
- Fusing is a type of manufacturing process for joining or terminating electrical magnet wire, that is coated with a varnish (film) type insulation, to itself or some type of electrical terminal, without prior removal of the insulation.
- During the fusing process, the varnish film insulation is vaporized automatically.

10.3 FUSING PROCESS IN GARMENTS:

- The fusing process is one kind of alternative method of fabric joining which is vastly used to attach the interlining.
- At present, apparel manufacturing cannot be imagined without a fusing process.
- As its importance, this article has presented a detailed discussion on the fusing process with its classification and defects.



Figure 31 Fusing Machine

10.4 FUSING INSTRUCTIONS TO BE FOLLOWED:

- The specifications given by the supplier like temperature, pressure and speed should Only be set in the machine.
- The temperature and the fuse line of the machine have to be rechecked using a thermos Strip for proper fusing.
- According to the order file, fusing has to be used to the respective fabric only.
- The machine parameters like temperature, pressure and time should be checked per Every hour.
- The swatch of the running style should be put on the machine while fusing that Particular fabric.
- The workplace has to be maintained with good working conditions.

11. PRODUCTION DEPARTMENT

- Sewing is the most important operation on the process of garments making. Sewing means joining of different parts of garments.
- Record & details of sewing means joining of different parts of garments.

11.1 TYPES OF SEWING MACHINE:

- Single Needle Lock Stitch Machine
- Single Needle Lock Stitch Machine (with under bed Trimmer)
- Single Needle Lock Stitch Machine (with Edge cutter)
- Double Needle Lock Stitch Machines
- Single Needle Chain Stitch Machine
- Double Needle Chain Stitch Machine
- Over Lock Machine (3 Thread)
- Over Lock Machine (4 Thread)
- Over Lock Machine (5 Thread)
- Flat Lock Machine (Cylinder Bed)
- Flat Lock Machine (Flat Bed)
- Bar Tack Sewing Machine
- Button Holing Machine
- Button attaching Machine
- Mutely-Needle Chain Stitch Machine
- Single Needle Lock •Stitch Machine (Top Needle Feed)
- Single Needle Lock Stitch Machine (With variable top feed mechanism)
- Feed off the Arm sewing machine

11.2 DEFECTS CODE

FABRIC DEFECTS:

- Fabric damage/holes DH.
- Shade variation/Checking problem CS.
- Weaving defects.

SEWING DEFECTS:

- Puckering PP

- Broker / increases / skip / vertically joint BS
- Raw edges RE
- Run off RO
- Unbalanced/Unmated UM
- Smocking problem
- Trim problem TM
- Way Stitching WS
- Specs SP
- Cutting CP
- Other OT

CUTTING DEFECTS:

- Miscue MC
- Cutting Unbalanced/Unmatched CM

UM

- Tack to operator attaching margin should be equal.
- Add marking before attaching the panel.
- Mark the measurement on M/C bed.
- Charge marking pattern.
- Replace operator by trained operator.

RO:

- Replace operation foot with compensatory foot.
- Set guide on M/C for equal margin.
- Educate to operate in present of supervisor.
- Add light on machine because on dark color machine.
- Teach to operate ensure uniform seam allowance.

PP:

- Change the feed dog of machine.
- Check needle & change size.

- Add pressing before operation.
- Attach the panel with proper margin.
- Train to operator for add cut before O/C.
- Reset the machine tension & proper threading & machine.

RE:

- Add edge cutter M/C then attach the panel.
- Clean the loose thread before operation.
- Change blade of machine.
- Change folder & Reset M/C.

WS:

- Add stay stitch follow it's as guide.
- Change O/L guide for proper margin.
- Guide operation in the presence of supervisor.
- Improve operation handling in presence of supervisor.
- Add guide on machine.

BS:

- Change the needle of machine.
- Teach to operator for correct threading of machine.
- Reset machine tension.
- Replace SN machine with VBT machine.
- Change spring of M/C & rectify thread tension.

12 FINISHING DEPARTMENT

• In a garment industry finishing department 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.

• After the completion of washing in the washing department, the garments are sent to finishing.

- This is the last stage of the production process done before packing.

12.1 FUNCTIONS OF FINISHING

DEPARTMENT:

1.Thread Trimming:

In the stitching department, thread trails and thread chains are not trimmed neatly. Uncut threads and thread tails in garments are trimmed in the finishing department by helpers. Uncut and loose threads on garments are considered defects.

2.Checking garments:

All garments are checked at the finishing stage for visuals and measurement. Finishing checkers check the complete garment inside and out. Checking is done for garment detailing, such as care labeling, and trims.

3. Button attach and Butting holing:

Products those have trimming like button, snap button, eyelets are attached in finishing section.

4. Removing stains:

Stains and spots are found on garments. Spots are removed using a hand spot gun or by using a stain removing machine prior to pressing. Dust and stains can be removed by machine washing. So, many times finishing department wash garments inside department.

5. Repair work and mending

Defective garments may need to repair for stitching and fabric defects. All repair activities are done in finishing department itself instead of sending defective garments to stitching department.

6. Ironing garments:

Garments are ironed using a steam iron. This is done to remove creases in the garment. For knitted garments measurements are set by steam press. Vacuum pressing tables are used for garment pressing.

7. Folding and tagging:

Pressed garments are folded in a specified dimension. Tags, such as price tags and hang tags are

attached to the garment by means of a Kibble gun or threads. Packing garments:

Finally, properly folded garments are packed into poly bags as per customer requirements. Individual poly bags are then packed into bigger cartons.

8. Preparation of packing list:

The packing in-charge prepares a packing list for the shipment. After packing is completed for an order, the finishing department informs the concerned merchant.

9. Internal shipment audits

Quality department perform internal shipment audit in the finishing department. This audit is done prior to final inspection.

10. Documentation and reporting

Like other departments, finishing department maintain production records for pressing, and packing.

12.2 PRESSING INSTRUCTIONS:

- Garments should be pressed as per the approved sample provided.
- Pressing instructions should be followed as per the style requirement.
- In case any defect is raised while pressing like a glaze mark, inform the supervisor.
- All the garment components should be covered while pressing.
- Re-press the garments if required.
- Follow the marking given on the pressing table (if instructed).
- Use the buck while pressing if required. Use the rubber mat and shoes while working on the pressing table.
 - Check the steam pressure before pressing.
 - Check whether the watermark is left on the garment after pressing.

12.3 INITIAL CHECKING:

- 100% checking is to be done the stitched garment.
- Garment is checking inside out as per the garment checking sequence.
- Being displayed at the workstation.
- In case stitching attention is found sticker is to be placed at the defect.
- Defective piece is separated kept in specified location & report to the factors.
- In case stain is found, it is to be kept in specified location.
- Recheck the pieces again other rework.

12.4 MEASUREMENT CHECKING:

- Measurement checking is done for 100% Garments.
- check the measurement table before use.
- Check measurement with Tolerance given in the measurement sheet.
- All the required / Critical required as per Style are to be measured.
- In case any Measurement is found to be out of tolerance, the garment is to be kept separately & sent for rework.
- The garment is to be issued for label change or any further modifications required in the garment.
- If measurement found out of tolerance after rework the garment to be rejected.

12.5 METAL DETECTING MACHINE:

- A ferrous card of calibration is placed on the belt at 9 defined positions (A1-A9).
- It's recorded for the positive and negative results.
- If the output of the calibration card is negative i.e., if a metal is detected, the belt moves back.
- These results are observed and noted for 8 hrs.
- The ferrous card is placed at 3 different level of heights.
 - First level – placing the ferrous card on the conveyor directly.
 - Second level – placing the ferrous card at the height of 1.5 inches.

Third level – placing the ferrous card at the level of 3inches.



Figure 32 Metal Detection Machine

12.6 BUTTON PULLING TEST:

TESTING PROCEDURE :

1. We set up and verify the button strength tester by using 15lb (6.82kg) $\pm$ 10% calibration weights. (Note: The calibration weights are optional.)
2. We attach the suitable upper clamp to the hook of the Pull Gauge. (Note: Accessories are optional.)
3. Adjusting the Pull Gauge to zero position by Zero Tare Ring. (Note: The Pull Gauge is under “ON Switch”.)
4. Place the specimen on the correct position, the concave indent of the Lower Fabric Clamp. And the button is positioned centrally. Through the press of the Arm of Lower Fabric Clamp to clamp the fabric tightly.



Figure 33 Button Pulling Test Machine

5. Lowering the Universal Clamp until it is above the test piece by the Right-hand Flywheel.

6. Clamping the button of specimen onto the Universal Clamp. (Note: The horizontal arm keeps upward so that it can clamp the test piece easier.)

- Driving downward the Universal Clamp to clamp the specimen;
- To adjust the Upper Snap Clamp, until its edges of three claws just touch the circumferential edge of the button;
- To ensure that only the button is held by the clamp, and the fabric is not affected;
- Tightening the clamp to grip the button at the same time.

(Note: If larger button needs to be tested, it should use the Upper Grasp Clamp, the original holding plate in the Lower Fabric Clamp is replaced with the Grasp Clamp.)

7. Turning on the “ON” switch. If necessary, we can re-adjust it to zero position.

8. Turning the Right-hand Flywheel to keep the clamp moving upward

9. The button may separate from fabric while the gauge reading is lowering than 7 kg;

If the button bears the 7 kg force, the clamp should hold it for few seconds and loosen it; (Note: The force applies from 0 to 7 kg within 5 seconds.)

When the breaking load reaches 7 kg or less, we should record the data of breaking power. If the button is not separated from the fabric until 7 kg, operator should adjust the Pull Gauge to “ON” switch again to stop it and keep the force of 7 kg for 10 seconds.



Figure 33 Button Pulling Test



Figure 34 Buttoned Pulling Test

If the fabric is slipped out of the Lower Fabric Clamp during the test, we suggest to repeat the step 4 with a new specimen.

If the button is slipped from the Upper Clamp during the test, we have to discard the it and repeat the test procedure with a new specimen.

10. The rest of male and female button specimen should repeat step 2-9 and record its result.

12.7 FINISHING DEFECTS:

- ❖ The defects that can be identified in the finishing department are organized are
- ❖ Oil or soil stain
- ❖ Poor hand-feel
- ❖ Uncut threads
- ❖ Heat seal misprint
- ❖ Stitching defects like (skip stitch, broken stitch, etc.)
- ❖ Wrong size tagging
- ❖ Wrong placement of the tag

❖ Poor pressing

12.8 PROCEDURE FOR FEEDING GARMENTS IN THE METAL DETECTOR:

- 100% garments are passed through the metal detection machine.
- The finished pieces/ garments are placed one-by-one which are ready for packing at the front side on the top of the running conveyor belt and observe the movement of the garment.
- The finished goods passed through the metal detection machine are collected from the end of the machine.
- The pieces passed which are free from any metal contamination are recorded.

13. WASHING DEPARTMENT

- Washing is normally done after garment stitching.
- According to the fashion trend and the customers' demand, buyers ask for garment washing for specific product ranges. For the washing, apparel buyers mention exactly what types of washing they need for the order.

13.1. IMPORTANCE OF GARMENT WASHING:

• The primary objects of garment washing include Importance of Garment Washing
The primary objects of garment washing include.

- To remove starch that applied during fabric manufacturing.
- To soften the garment hand, feel and improve bulkiness

To remove dirt, spots, oil stains that accumulate to the garment at the garment manufacturing processes.

• To remove chemicals used during the printing process and embroidery process as mentioned above, sometimes you wash garments to meet customer requirement.

- Washed clothes can be worn directly after purchasing.
- To give a faded look or any other color-tinted look to the garment.
- To stabilize garment shrinkage and dimensional instability.
- To improve bulkiness and soft hand feel

To have an idea about washes, common garment washing types are explained below.

- To remove starch that applied during fabric manufacturing.
- To soften the garment hand, feel and improve bulkiness.
- To remove dirt, spots, oil stains that accumulate to the garment at the garment manufacturing processes.
- To remove chemicals used during the printing process and embroidery process.
- As mentioned above, sometimes you wash garments to meet customer requirement.
- Washed clothes can be worn directly after purchasing .
- To give a faded look or any other color-tinted look to the garment.
- To stabilize garment shrinkage and dimensional instability.
- To improve bulkiness and soft hand feel.

13.2. SOP WASHING DEPARTMENT:

- Wash the controlled area and critical area garments separately.
- Wash the booties of garments separately visually check that there are no cloths inside the machine of previous cycle.
- Planning sheet is collected and plan is discussed with the factory management for the requirement verification of the styles having sufficient buffer.
- Ensuring all the production for the running styles is available and it is running smooth.
- Making sure all the allotted style chemicals and recipes are available, collected prior pre-production activity to meet requirement availability for lead time.
- The objectives should be followed as given by the management like rewash is less than 1% should be followed.
- All the materials should be collected within 5 days of plan cut date (PCD) for checking and approving to meet the lead time by conducting the pre-production meeting.
- Prioritizing self-life materials on the basis of First-In-First-Out.
- Recipes and the Consumption should be finalized and costing should be on target during the initial stages.
- Washing operations, hydro extraction, drying are set with the standards.
- Type of washing, fabric and end users to meet the quality, ensuring that the on-line processwork is happening as per the set standards.
- Ensure that the before and after inspection is carried out.

- The parameters to be checked are uncut thread, snickering on the garments, stain, damages and other issues.

- That which is include before and after wash measurements.

- After wash, the quality is checked with approved washing standards such as hand feel, damages, shade, washing stains and also before and after was measurements according

To the approved special sheet.

- Ensure that the chemical consumption is verified on meeting the requirements.

- The chemical accounts should be updated on daily basis to verify the minimum level requirements.

- The rules for the chemical storage should be followed. Chemicals are issued to production authorized by DC as specified.

- Make sure that if any communication for the washing improvement from production, merchandising, buyer is implemented and cross-checked as it is communicated.

- Garments received from the factories are counted and tallied.

- If any shortages and damages are observed during washing, the information should be given to the concerned factories separately for the necessary action, the requirements of the compliance from the pollution control board and following the norms.

- pH should be maintained as suggested by the buyers, merchandising department and Labs.

- On the final PO shipment, chemical consumption report is prepared and informed to the central purchasing team whether it suits to other styles.

- To make the recipe with available chemical and reusing for reduction in wastage.

13.3 TUMBLE DRYING:

- Tumble drying is simply machine drying rather than line drying or laying flat to dry.

- This method is called “Tumble Dry” because clothes tumble in the dryer drum where airflow, along with heat, dries clothes quickly.

- But not all fabrics are made to be tumble dried—always check the care tag first.

- Tumble dry low is a low heat setting that is typically used for fabrics that are



Figure 35 Tumble Drying Machine

delicate or prone to shrinkage.

- Garments made from delicate or shrink prone fabrics such as cotton, wool, linen, or polyester (can you shrink polyester).

- Should use the tumble dry low setting in the dryer.

- Tumble dryer machine capacity is set for 70% of clothes.

- Once the garments are loaded in the dryer, close the dryer cap to lock it and switch on the machine.

- Temperature of 50°C-65°C should be maintained for the cotton fabrics.

- The dryer should run continuously minimum for 30 min.

- A gumboot has to be used by the operator while operating the machine.

- At the regular intervals, the tumbler should be cleaned.

- If loose electric wires of machine are observed, inform the senior immediately.

12.4 WASHING AUDIT PROCESS DEPARTMENT:

- Washing is carried out for the particular style number as specified by the buyer.
- The washing standard of the shade lot is given to the washing QA which is approved and signed by the merchandiser.
- At the AQL level 1.5,washing audit is carried; whereas the QA audits are done for the shade variation, hand feel, or any other significant quality defect
- A different capacity of washing machines, dryers and hydro extractors are placed in the washing section.
- Depending on the capacity of the machine and garment type, a specific load size is Followed for the washing and every load of washing is documented.

13 .QUALITY DEPARTMENT

13.1 Quality Department Process Flow:

- The planning assistant reviews allocation, tech-pack, and reference sample from Planning.
- The sample manager reviews the tech-pack of the sample to clarify any deviation with merchant.
- Sampling head should proceed with the sampling process.
- Fabric quality checker should follow up for the fabric inspection, collecting the reports from the supplier, reviewing and taking the necessary actions.
- The trim card is verified as per the bill of materials by the store quality checker.
- The sample manager conducts the meeting to give the guidelines for the size set, Internal PP, SMS Sample, GS Sample and other sample making.
- Size set, external and internal PP, SMS sample, counter sample and other samples required are executed by the sample manager.
- The fabric QC should follow up on the garment check report and internal program Specific report.
- 100% shade variation, CSV, shrinkage, width segregation is done as per the requirements by the fabric QC.
- 10% fabric inspection and shade variation are done based on 4-point inspection system.
- If the inspection fails, another 10% inspection is carried out.
- Even if this inspection fails, it is informed to the correspondent merchant.

- If the inspection passes, color coding is done and the fabric is stored in fabric racks with identification.
- Color fastness of all labels is observed by attaching it to the body or a white fabric, Visibility of markings which is done by approved markers on body after the fabric is washed and nickel test is conducted for metal trims in the centralized lab.
- Trims audit is done at a level of at AQL 1.5.
- If this audit fails, checking is done at level 2. Though it fails, the trims stored are placed at the rejected area with identification for further actions.
- If the audit passes, the trims are stored at the designated area with identification.
- Trims store by the store assistant.
- The sampling quality checker reviews the size set sample, internal PP, SMS sample, Counter sample for technical aspects.
- If the technical aspects of the sample fail, patterns Will be revised by taking necessary actions and remaking the size set.
- If the size set review passes, it is offered to the buyer.
- If the buyer approves the size set, the buyer reference sample is dispatched to the head-office.
- The reference sample is handed-over to the nominated QA and an updated patterns for pilot run will be released.
- The quality assurance manager follows ups on shade and shrinkage grouping from the Pattern section, fabric relaxation as per the requirements, fabric face-side combination card approval and FPT reports from the merchant.
- Conducting pre-production pull test for button/snap, metal detection for metal trims and internal and external PPM.
- Necessary actions such as fabric combination card, shade shrinkage report, mini marker, defect standard, numbering placement are followed on reviewing in cutting section.
- Fit fails, necessary actions are taken in coordination with the concerned department.
- If it passes, pilot run pieces are cut depending upon the order quantity of all sizes.
- Sewing quality executives and supervisors execute the pilot run.
- Review of the pilot run is done by the NQA (National Quality Assurance).
- If the review fails, pilot run is remade.
- If it passes, pilot run is offered to the buyer.

- If the buyer approves the quality run, an approval to the cutting section for proceeding to the bulk cutting.
- The cutting quality checker (QC) inspects the lay marker.
- If there are any deviations in the lay marker, corrections are done.
- As per the approved pattern, cut parts are inspected for shape and size by cutting QC.
- If there are any deviations in the patterns, corrections are made.
- The helpers collect these cut parts for numbering and bundling.
- Panel inspection is done for the big panels in the style by the checker.
- If there are any requirements of embroidery and printing, the quality checker conducts an audit.
- Cutting QC conducts an inspection at AQL. If the inspection passes, the cut panels/bundles are issued to the sewing section.
- The follow-up on the necessary actions based on the review in sewing section for cut Parts delivery for shade.
- Shrinkage, fabric and trims approval card, marking templates, PP sample with comments, size set pilot run comments are done.
- If it fails, necessary action is taken in coordination with concerned department.
- If it passes, bulk production is executed.
- Garment inside checking, inline quality audit based on AQL 1.5 or 2.5 is done as per buyers
- Garment topside checking, trim visual inspection and garment topside ironing is performed.
- 100% measurement checking for key measurements and 2 pieces per hour for measurements.
- End-line quality audit is performed at AQL 1.5 as per the buyer requirement.
- Shade segregation is followed and metal detection machine operator performs the metal detection process.

13.2.DEFECTS CODE LIST:

Defects & Codes

- Miscues (MC)
- Uneven (CM)
- Ragged edges (CE)
- Past Missing(SP)

- Match plaids / Strips (MP)
- Match shade (MS)
- Selvedge / holds visible (CW)
- Needle Mark(CK)
- Cutting as per pattern
- On gain
- Cross grain
- Bias grain
- Numbering

14 PACKING DEPARTMENT

The packing section is the part finishing section of the readymade apparel industry. Normally, the packing section packs the goods as per ratio or assortment. In the later, the apparel inspector inspects the apparel product according to the industrial approval packing list.

14.1 MOISTURE INDEX:

Material / Fiber	Max.Moisture Index
Cotton	67
Wood	24
Linen	77
Silk	45
Viscose	45
Nylon / Polyamide	67
Acetate	60
Acrylic	40
Polyester	39
Carton box	65

14.2 INTERNAL AUDITING – CARTON BOX

- In Checking of Carton physically for the garment quantities in case of solid pack and theratio pack.
 - After checking the quantities, a seal is put inside the carton before closing.
 - If there is any deviation found in the quantities or carton, it has to be updated in the carton audit report and has to be brought to the notice of finishing and quality in-charge.
 - Offering the cartons to the internal QA for inspection.
 - Dispatching the past cartons to the cartons to the carton storage area.
 - If any failures have been observed, it should be sent back for re-checking.
 - Sending the past and sealed cartons to the storage area as per the instructions given.

14.3 PROCEDURE FOR PACKING DEPARTMENT:

- Style and PI details are received from production merchant/PPC.
- Received the checking/inspected pieces from the following department for metal detection.
- All the garment are passed through detection machine as per buyer specification.
- Calibration of the metal detection machine is carried out in every 2 hours.
- Cooking period of two hours is followed for all garments.
- If there is any failure during the period, the. All the garment kept in the box are passed through metal detector to ensure that there is no metal contamination.
- If some style/garments have the attached trims of metal contents, that the garments are passed through metal detection machine before the trim is used / attached to the garments.
- 100% of the garment are lucked for tags, size label garment audit, before going to start packing process.
- If case the wrong pieces are sent back to finishing it will be processed with correction.
- In case of the failure of the audit all the pieces are sent back to the finishing department for rechecking of all the pieces received in the lot.
- In case of passed the garments are received by packing department.
- Segregation of package pieces as per approved lots, of required our lot should be packed in one carton.
- Packing trim card is displayed in packing section after approved by merchant/D&A.
- One sample is displayed with all packing specifications & approved trims by D&A / Concerned merchant.

- Tagging may carry out occasionally in packing in case critical package in case critical packing specifications, only when there is thread Kimble is used for tagging.
- Tag gun must not be used inside the packing section.
- Packing hangers & Sizes to the garments if required.
- Folding is carried out whenever required in packing specifications.
- The PO in the specified poly bag as per buyer specification or approved trim card.
- Packing list is made or received from production merchant/PPC.
- Make assortments or / out solid packing as per specifications.
- Carton making is carried out as per specifications given by the customer or specific and the buyers packing manual.
- First carton evaluation is carried out when the first carton is ready with all specifications, required by the customer.
- Hourly packing audit is carried out by packing QA, sample size of this audit is 100% of the packed carton on every hour with zero defect.
- Final packing audit is carried out a. Specified AQL by the buyer when 100% of the PO quality is packed with complete carton marking.
- Final / per final inspection is carried out after the PI is completed packed.
- If the FRI is failed for any reason, the whole lot is sent back to finishing/packing department.

15 TRAINING DEPARTMENT:

Standard Operation procedure of Training Department:

Development training Module:

- Training module are designed, developments received as per the requirements of the particular department.
- Which may be useful for their needs that can be received time to time as per the feedback & based needs

Preparation of Annual Training Calendar:

- Annual training in which in prepared in which different activities.
- That are given different frequency routine training.
- Daily operation training.

- Operation training is done as per training calendar development by senior trainer.
- One completed sewing line is covered each day & the frequency is of 45 days.
- The attendance includes QA manager, QA executive, line QC, Initial Final checkers, IE executive maintenance, line supervisor, line supervisor, in charge Operation, pressing helpers, Feeders trainer.
- The training is given via video & power point presentation & inter ratios with the operations.
- The topic covered are as follows previous operations check.
- Self checking of operations.
- Self trimming
- Wipe functional
- DHU
- Line Alteration
- Common defects with solution.
- Threading tension checking.
- Water soluble
- Self checking body work station.

15.1 SCHEDULE FOR 15 DAYS TRAINING PROGRAM:

Days	Training Operation
Day 1	A brief on the training program is given to the operators.
Day 2	Basics of the sewing machine is explained to the operators.
Day 3	Test 1 is started
Day 4	Trainers make operators perform burst and round exercises.
Day 5	Rectangle exercises are trained to the operators.
Day 6	Different types of stitches, fabric handling and machine controlling are trained
Day 7	Different types of seams, fabric handling and machine controlling are trained.

Day 8	Test 2 is started. Cuff making and the mind games are trained.
Day 9	Stitching of the essential components of the garment are trained.
Day 10	Test 3 is started.
Day 11 & 12	Sleeve and placket stitching is trained.
Day 13	Pocket, Pocket Flap , front placket stitch is trained
Day 14	Binder ,and folder operation are trained.
Day 15	Test 4 is started.

Daily morning operation counseling:

- Daily Operation.
- Counseling is done by training, QA manager, QA executive, line QC, line supervisor, IE executive & maintenance mechanic.
- Top five DHU operation & top 5 uncut thread operations are conversely.
- The garment parts / regions covered by different checkers.
- Checking sequence.
- The frequency of sewing checkers training is twice month.

Finishing checkers Training:

- Both the initial & final Checkers are trained. The point discussed are as follow.
- The nature of defects begins found.
- Finishing top 3 Defects DHU.
- The garment parts / regions covered by different checking sequence.
- The frequency is once in a week.

Daily Finishing Checking Counseling:

- The Counselling is carried out each day in the morning based on the previous day finial checkers pieces DHU based in Auditor audit.

- The counselling is conducted by finishing QA, finishing supervisor & Trainer.
- Counselling is based on the defects per units (DHU%) based on finished auditors finding & Defectives pieces are shown.
- Cutting training.
- Embroidery training.
- Washing training.
- Packing training.

16. CONCLUSION

On the Whole, this internship was a useful experience. We have gained new knowledge; skills met many new people. We achieved several of our learning goals. We got insight into professional practices currently advocated in the industry. We learned the different facets of working within established industry. Related to our study we learned more about the manufacture, assembly and testing of three phase distribution transformers.

Furthermore, we have experienced that it is of important that education is objective and that we have to be aware of the industrial aspect of the topics we study. This internship programmed was not one sided, but it was a way of sharing knowledge, ideas and opinions.

The internship was also good to find out what our strengths and weaknesses are, this helped us define what skills and knowledge we have to improve in the coming time . We can confidently assert that the knowledge we gained through this internship is sufficient to contribute towards over future endeavors. At last, this internship has given us new insights and motivation to pursue a career in core electrical departments.



BIBLIOGRAPHY

I have taken the notes from Shahi Exports Pvt Ltd which is displayed on notice board in each department.