



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)

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

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INTERSHIP REPORT

2020 -2023



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SCHOOL OF BUILDING AND ENVIRONMENT DEPARTMENT OF FASHION DESIGN

INTERNSHIP REPORT (S105AINT)

2022-2023



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SCHOOL OF BUILDING AND ENVIRONMENT DEPARTMENT OF FAASHION DESIGN

INTERNSHIP REPORT (S105AINT)

2022 - 2023

Name of the Student: Keerthana.K

Reg No.: 40105005

Semester: V

Batch: 2022 - 2023



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SCHOOL OF BUILDING AND ENVIRONMENT

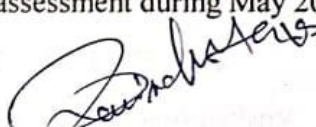
DEPARTMENT OF FASHION DESIGN

INTERNSHIP REPORT (S105AINT)

2022 - 2023

VIVA-VOCE EXAMINATION

This is to certify that the Internship Report (S105AINT) is the work of Keerthana.K who had undergone training in Intimate Fashions India Pvt Ltd. ~~Company~~ / Industry / ~~Boutique~~ and has been monitored by the continuous assessment during May 2022 to Jun 2022.


K.S. RAVI SIDHAARTH


Head of the Department
Head of the Department
Fashion Design

Submitted for Viva-voce Examination held on 21/02/23
Sathyabama Institute of Science and Technology
Chennai-600 119.


Internal Examiner
(S.SAVITHRI)


External Examiner



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DECLARATION

INSTITUTION DETAIL

Faculty co-ordinator: Mr. Ravi Sidhaarth. K.S

I Keerthana.K hereby declare that this Internship Report (S105AINT) for 45 days from 15th May 2022 to 30th June 2022 done by me under the guidance of Mr. Ravi Sidhaarth. K.S is submitted in partial fulfillment of the requirements for the completion of Internship training session.

DATE:16/05/2022

PLACE: Guduvanchery

SIGNATURE OF CANDIDATE

INTERNSHIP DETAIL

INDUSTRY / ORGANIZATION DETAIL

Mentor:Mr. Sivajith Kumar

Designation of the mentor:Manager MOS

Company name:Intimate Fashions India Pvt Ltd.

Company address:Intimate Fashions India Pvt Ltd, Thiruporur Kottamedu High Road,
Nellikuppa Rd, Village, Nandhivaram,
Tamil Nadu - 603202.

INSTITUTION DETAIL

Faculty co-ordinator:Mr. Ravi Sidhaarth. K.S

Designation of the Faculty co-ordinator: Assistant professor

Student name:Keerthana. K

B.Sc. Fashion Design

Institutions Name:Sathyabama Institute of Science and Technology.

Institutions address: Sathyabama Institute of Science and Technology,Jeppiaar Nagar,
Rajiv Gandhi Salai,Chennai - 600 119,Tamilnadu, INDIA.



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Ref: SHD/2022/05/14/A24

14 May, 2022

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms. KEERTHANA.K**, Register Number **40105005** is a Bonafide student of our Institution pursuing **BACHELOR OF SCIENCE** in **FASHION DESIGN** during the academic year **2021-2022**. She will be completing the course in the year **2023**.

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.

INTIMATE FASHIONS

27-05-2022

Internship Confirmation Letter

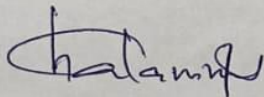
To,
Sathyabama Institute of Science and Technology College,
Jeppiaar Nagar, Rajiv Gandhi Salai,
Chennai – 600 119.

Dear Sir/Madam,
Greetings!

We would like to inform you that, we are permitting **Ms Keerthana (Reg. No: 40105005)** S/o Krishna Kumar to do her internship in our organization with MOS department for the period of 3 months. The student expected to follow the safety and other policies norms by the company.

Best Regards,

for **Intimate Fashions (India) Private Limited**



K. Palanivel
Director – Operations

A joint venture of  MAS  MAST Industries Inc. 

INTIMATE FASHIONS (INDIA) PRIVATE LIMITED | CIN: U18101TN1997PTC037536

Registered Office: 517-519, Thirupporur-Kottamedu High Road, Nandivaram Village,

Guduvancheri - 603 202, Chengalpattu District, Tamil Nadu, India.

T +91 44 67404400 F +91 44 67404692 E intimate@ifi.co.in

INTIMATE FASHIONS

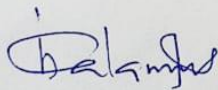
30th June 2022

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms. Keerthana (40105005)** pursuing B.Sc(Fashion Design) in Sathyabama Institute of Science and Technology has successfully completed her Internship in the MOS department from 15th May 2022 to 30th June 2022.

We wish her all the best for her future endeavors.

For Intimate Fashions (India) Private Limited,



K. Palanivelu
Director - Operations

A joint venture of  MAS  MAST Industries Inc. 

INTIMATE FASHIONS (INDIA) PRIVATE LIMITED | CIN: U18101TN1997PTC037536

Registered Office: 517-519, Thirupporur-Kottamedu High Road, Nandhivaram Village,

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T +91 44 67404400 F +91 44 67404692 E intimate@ifi.co.in

DEPARTMENT OF FASHION DESIGNING

PROFESSIONAL TRAINING REPORT 2022

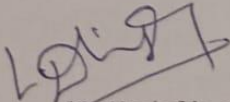
(Continuous progress report of the fashion design trainee for the period one month in the boutique to be submitted to HOD)

1. **Name of the industry:** Intimate Fashions India Pvt Ltd.
2. **Address and Contact Number:** Intimate Fashions India Pvt Ltd, Thiruporur Kottamedu High Road, Nellikuppa Rd, Village, Nandhivaram, Tamil Nadu - 603202
3. **Name of the student:** Keerthana. K
4. **Duration:** 16.05.2022 – 30.06.2022
5. **Total no of days:** 45days
6. **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 work	Excellent	Good	Fair	N/A
Understanding of departments and its functioning		✓		
Participation in the Industry		✓		
Handling the given work		✓		
Punctuality		✓		
Coordination with other workers		✓		
Attitude		✓		
Overall performance	Good.			

Compliments & Suggestions:


Signature of the Head of the office:

INTIMATE FASHIONS (I) PVT LT
Survey No. 344/2A2D/2B/3,
Nellikuppam Road, Karanai Puducheri Villa
Guduvancheri, Chengalpattu Taluk,
Chengalpattu (District) – 603 202.

SYNOPSIS

- This internship at Intimate Fashions India Pvt Ltd has been a great learning experience for me, for my future career. It has given me the opportunity to learn about the production and management of apparels with time target.
- In this report I have given the details of my learning, my experience and activities over the process of learning, the best reflection of my internship.

WORK DIARY

DATE	WORK DONE
DAY 1(16/05/22)	WENT THROUGH PROCESS FLOW FROM FABRIC SPREADING TO PACKING.
DAY 2 (17/05/22)	ABOUT THEIR CUSTOMER (BUYER)& PRODUCT LIST.
DAY 3 (23/05/22)	IN THE PRODUCTION UNIT (IN-DEPTH VIEW OF THE PROCESS)
DAY 4 (23/05/22)	IN THE PRODUCTION UNIT (IN-DEPTH VIEW OF THE PROCESS)
DAY 5 (24/05/22)	IN THE PRODUCTION UNIT (IN-DEPTH VIEW OF THE PROCESS)
DAY 6 (25/05/22)	IN THE PRODUCTION UNIT (IN-DEPTH VIEW OF THE PROCESS)
DAY 7(26/05/22)	HOW CAN IMPROVE DESIGN (DECATHLON)
DAY 8(27/05/22)	PROCESS MAPPING
DAY 12(1/05/22) & (2/06/22)	CYCLE TIME FOR SPREADING,

	CUTTING, AQL, BUNDLING
DAY 14(3/05/22) & (4/06/22)	CYCLE TIME FOR SPREADING, CUTTING, AQL, BUNDLING
DAY 16(6/06/22) & (7/06/22)	(SPREADING) CYCLE TIME
DAY 18(8/06/22) & (9/06/22)	(CUTTING) CYCLE TIME
DAY 20 (10/06/22)	(BUNDLING) CYCLE TIME
DAY 21 (11/06/22) & (12/06/22)	(AQL) CYCLE TIME
DAY 23 (13/06/22) & (14/06/22)	(LABELLING) CYCLE TIME
DAY 25 (15/06/22) & (16/06/22)	(LINE AQL) CYCLE TIME
DAY 27(17/06/22) & (18/06/22)	(PACKING) CYCLE TIME
DAY 31(22/06/22) & (23/06/22)	(PACKING) CYCLE TIME
DAY 32(24/06/22) & (25/06/22)	ZONE PACKING
DAY 34(28/06/22) & (30/06/22)	ZONE PACKING

CONTENT

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ACKNOWLEDGMENT

I would like to express my gratitude to the Board of Management of the Sathyabama Institute of Science and Technology for helping me complete this internship.

I am grateful to Professor K S Ravi Sidhaarth and Head of Department Ms.S.Kritika, M.Sc., M.Phil., SET, Fashion Design, School of Building and Environment, for giving me the support and information I needed during the progressive evaluations at the appropriate time.

My mentors, Mr. Sivjith, Manager MOS, Ms. Delphine, HR Manager, and Mr. Palanivelu, Director Operations, Intimate Fashions Pvt. Ltd., deserve a special thank you for providing me with this chance and for their unwavering encouragement, patience, and guidance. I also want to express my gratitude to all those folks whoever in the institution who gave small and big inputs to develop my knowledge, through this report.

ABSTRACT

One of the top garment manufacturers in India, Intimate Fashion India Limited specializes in producing high-end clothes of the finest quality for fashion companies all over the world. They are at the cutting edge of technology, design, innovation, and full-scale production. In order to produce comfort garments, it makes use of their vast expertise in manufacturing and developing a variety of technical solutions, with an emphasis on investment optimization. The Institute allows the student programs like Internship & Projects, with flexibility in learning, line & length of fashion industries and projects. Students, even at the undergraduate level, get to participate in on-going research and technology development, Production, Marketing & Merchandising of Garment Industry- an opportunity unprecedented in India. As a result, a vibrant student coexists with a strong experienced employee. The goal of this internship is to development of organizational skills and internal control procedures that are relevant to the garment sector. In the production section, 45 days of hands-on training are permitted. It's a fantastic opportunity to gain knowledge about various duties and how the appeals industry functions. In this report discussions are about, client and customer, various departments like MOS (MAS Operating system), HR (Human Resource), Production department, Quality, NSIT (New Style Integration Team), Merchandise, Shipment, Purchase, Planning, CAD (Computer Aided Designing), RMWH (Raw Material Ware House), Cutting, Training line, Finance, IT (Information technology), FG/FID (Finished Goods/Final Inspection), Autonomation, Engineering. Three topic the tittle is project brief of working report. Working format from day -1 (16/05/22) to day -35(30/06/22) such as spreading, auto cutter, bundling, labeling, moulding, pre- moulding, sewing, AQL, packing, FG (finished goods). Through this report a clear picture of the knowledge given to an undergraduate fashion designer, and its outcome is analyzed, so that it will help more activities and processes to enhance the Internship programs in future.

INTRODUCTION

INTIMATE FASHION INDIA PVT LTD is a non-govt company, incorporated on 17 Feb, 1997. It's a private unlisted company and is classified as 'company limited by shares.

INTIMATE FASHION INDIA PVT LTD is a Pioneer in Specialty apparel manufacturer in India. This is One of the leading Apparel manufacturers in India, at the forefront of technology, design, innovation and full-scale production specializing in Intimate and active wear, high-end apparel with highest quality to high-end global fashion brands across the globe. Intimate Fashions India is perfectly positioned to stay on top of the latest trends and enhancing ever-changing world of fashion, with a commitment to provide exceptional products and service which meet the high expectations of their customers. Intimate Fashion India Joint venture of MAS Holdings, Triumph & Victoria's Secret - specialized manufacturer of value-added apparel for 2 decades with serving global brands.

Clients And Customers

- Decathlon
- Victoria secret
- Jockey
- Victoria sport
- Pink

Inspired

- Company Infrastructure is the important thing in the company for the employees they want peace full mind when they came to company.
- (WBA- Women Beyond Award) to encourage the employees and increase the will power of employee by motivating them.
- Safety precautions to ensure the safety of employee.
- Uniform color code to identify the employee by their team.
- In the rainy season company gives more important to the employees and taking care of them health by giving hot water, speech by doctors.

Awards

- Best Employer
- Best Women Friendly Company
- Best Exporter Award
- Lean Award
- Export excellence Award
- 5s Model Company
- Safety Awards

Departments

- MOS (MAS Operating system)
- HR (Human Resource)
- Production department
- Quality
- NSIT (New Style Integration Team)
- Merchandise
- Shipment
- Purchase
- Planning
- CAD (Computer Aided Designing)
- RMWH (Raw Material Ware House)
- Cutting
- Training line
- Finance
- IT (Information technology)
- FG/FID (Finished Goods/Final Inspection)
- Autonotation
- Engineering

OBSERVED

MOS (MAS OPERATING SYSTEM)

Founded in 1987, MAS Holdings is recognized today as a fully integrated, sustainable apparel manufacturer, employing over 100,000 people across 16 countries. MAS spans 57 manufacturing plants with established design locations placed in key style centers worldwide. The MAS portfolio has expanded exponentially, filtering into and revolutionizing IT, brands, wearable technology, FemTech, start-ups, and fabric parks worldwide. MAS provides design-to-delivery solutions to leading global apparel brands.

Sri Lanka's MAS Holdings, one of South Asia's largest design-to-delivery apparel solutions providers, has unveiled its latest venture, Runway Kit, to democratise manufacturing and help fashion start-ups and medium-scale brands to get easy access to the supply chain.

Adaptive garments developed by MAS facilitates ease and independent dressing, focusing on the needs of adaptive users – such as single-handed or seated dressing. To create truly meaningful and inclusive clothing which further enhances ease of dressing and delivers greater comfort to adaptive users, MAS leverages specialized garment construction to provide sensory-friendly finishes, employ magnetic or auto-aligning or auto-locking fasteners, accessory pouches, wicking fabric for sweat absorption and discrete closures.

Efforts of companies such as MAS can be vital in expanding the available offering of adaptive wear, providing the crucial push necessary for brands and retailers to tap into its potential.

Democratization of apparel manufacturing

MAS Holdings possesses over 30 years of experience in producing for the world's leading intimate, active and leisurewear brands. It is a technology-backed, design-driven and an ethically minded company making the same quality and craftsmanship accessible to entrepreneurs, designers and start-ups. The business understands that choice matters, which is why the platform offers three comprehensive packages to suit almost every need.

MOS is a department which helps to the company development. They find the wastage and remove all the wastage in the company to change the Non-value into a Value MMM- Man, Machine, Material. There are seven wastage which included in MMM.

- There are seven wastages:
- T- Transport (Unnecessary movements of products and material)
- I- Inventory (Excess of raw material, work in progress or finished goods)

- [illegible]

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Figure 1.2(MOS Pillars-Policy Deployment; Kaizen Mindset)

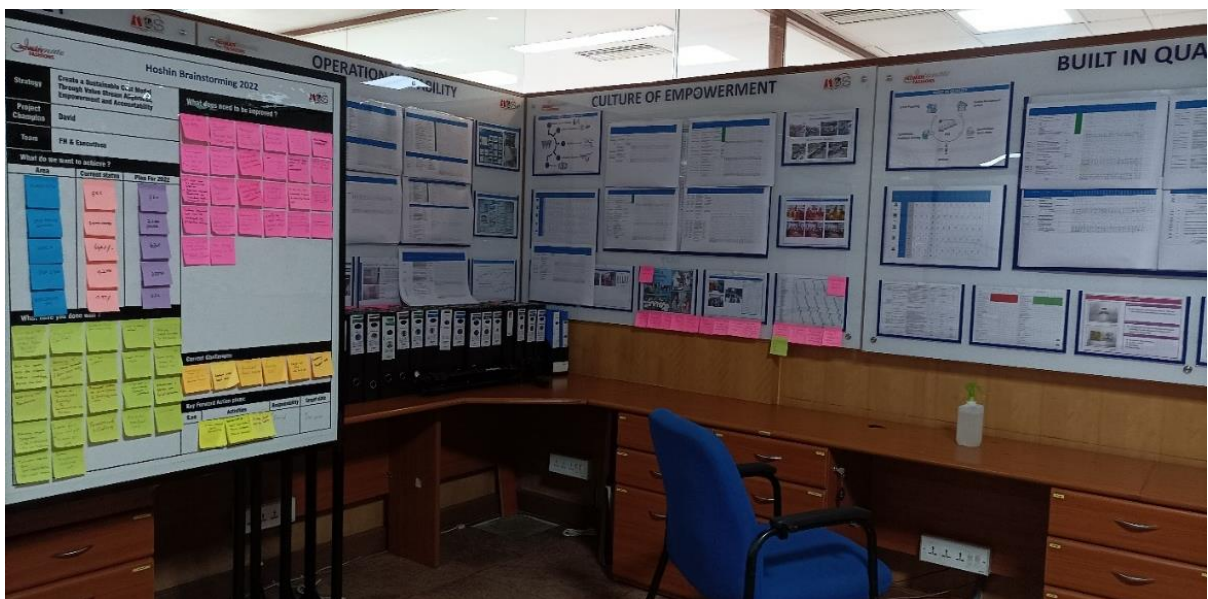


Figure1.3 (MOS Pillars-Operation stability; Culture of Empowerment)

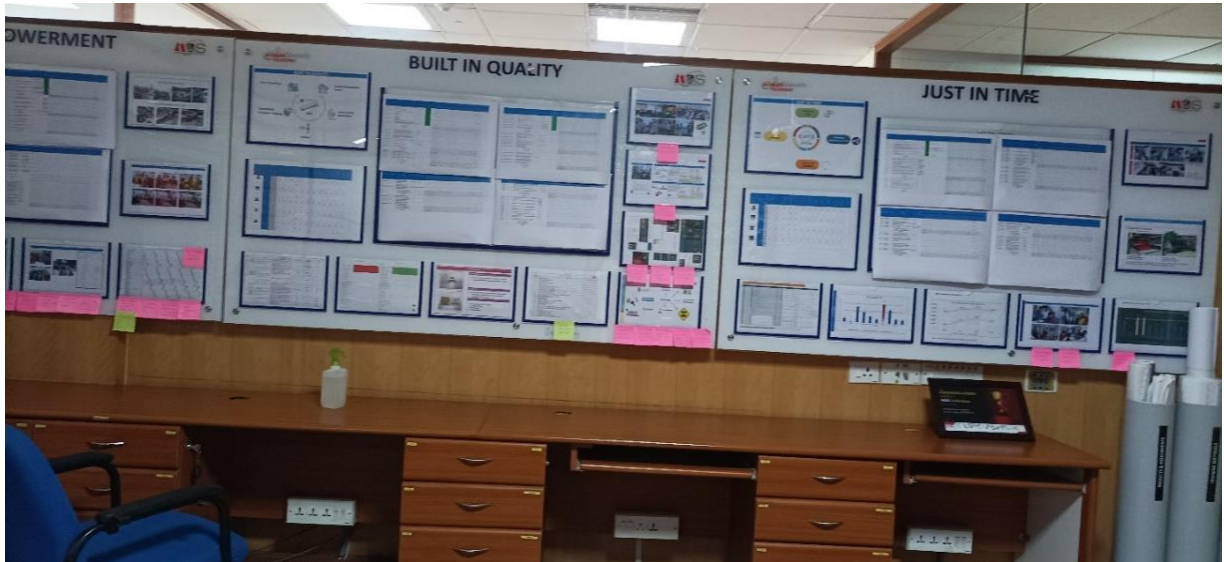


Figure 1.4(MOS Pillar- Built in quality; Just in time)

MOS Pillars

- Policy development.
- Kaizen mindset.
- Operation stability.
- Culture of Empowerment.
- Built in quality.
- Just in time.

POLICY DEVELOPMENT:

Long term busine



Hoshin Alignment



Lean leadership.

KAIZEN MINDSET:

- Operation Standardization
- Performance Metrics
- Kaizen Activity

OPERATION STABILITY:

- 5s
- Visual management
- Autonomous maintenance
- Planned maintenance
- QCO (Quality change over)
- Supplier Integration Material Pull

CULTURE OF EMPOWERMENT OPERATION STABILITY:

- Mutual Trust and Respect
- Safety and Ergonomics
- Skill Development
- HR system Alignment

BUILT IN QUALITY:

- Error proofing
- Quality Management system
- Systematic Problem Solving
- ANDON
- Standardized Worksheet
- TL & GL

JUST IN TIME:

- Built to Schedule
- Pull System Kanban
- Workload balancing & take continuous flow.

5s Implementation in Apparel Industry



5S comes from 5 Japanese words and each of them starts with S.

These are seiri, seiton, seiso, seiketsu, and shitsuke, if we translate these 5 Japanese words into English then we get Sort, Set in Order, Shine, Standardize, and Sustain. In the garment industry 5S works as a basic tool of Lean Manufacturing, a technique to set a well organized, clean, and visually attractive workplace. That's why the implementation of 5S in the Apparel Industry is required. Implementing the 5'S method is a base to implement quality improvement/lean procedures. Expecting the team to be and they do activities in each department: like monitoring, evaluate and drive the aspects very clean and organized so that, your Factory will look very planned and well Set-up.

5S	Japanese	English
	Seiri	Sort
	Seiton	Set in Order
	Seiso	Shine
	Seiketsu	Standardize
	Shitsuke	Sustain

Table 1 (The difference in English and Japanese words for 5S.)

Basic Concepts for 5S Implementation in Apparel

S1. Sort (Seiri)

5S start with sort. Sort means to sort out unnecessary items, use all machines, tools, equipment for regular use. Define daily needed items, weekly needed items, and monthly needed items and keeping separate. The store is broken, unusable or occasionally used items also should be defined. Keep records for eliminating unnecessary items that exist and new items. Each and every section of garments you may find many things are kept in a haphazard way. So, for these, you need to follow the first S from the 5S, i.e. Sort. Sorting according to items characteristics and importance.

S2 – Set in Order – SEITON

Setting order is important for 5S. All items, sections, and areas (In, exist) are clearly identified by a label and everything should be well organized. Never mix/store two category items in one place. Dividing lines, aisle mark, Stairway is clearly identified and clean as per standard. Confirm that the exits are accessible and unlocked during working hours. Confirm that, where necessary, the emergency exit doors have no panic hardware or lever style (one hand, one motion door openers). If you keep all of your store materials in your garments warehouse in a planned order basis, then whenever required that materials you can easily find out and get those materials. That's why all materials should be kept in accordance with the set-in order.

S3 – Shining – SEISO

The third S from 5S is Shine, actually mean cleanliness. All items/place of workplace Floors, walls, stairs, ceilings, pipework Racks, cabinets, shelves, Machines, equipment, tools, Stored items, materials, products, and lighting everything required to be kept clean. All cleaning tools and materials are easily

accessible. Cleaning assignments are defined and are being followed by the checklist and hang checklist on visible board. Do periodical pest control to make sure there is no insect. Cleanliness is not only a compliance issue but also this increases a healthy working environment in garments factories or offices.

S4 – Standardize – SEIKETSU

The first three steps of 5S are the key to implement 5S in the workplace. This section is about visualization by Information displays, related SOPs, signs, color coding and other markings are established everywhere of the factory also included procedures for maintaining the first three S's are being displayed. Do regular 5's audit using a checklist, give & post rating to each area. Need formal training, keep training records to approach towards improvement. These standardizations increase the operating efficiency of the apparel industry.

S5 – Sustain – SHITSUKE

This section is to sustain 5S in the textile and garments factory to be the way of life rather than just a routine. Success stories are being displayed (i.e. before and after pictures) in every section of the 5S board. Give rewards and recognition is part of the 5S system to sustain 5S.

S6 and S7(Extension of 5S)

Now, 5S have two additional points 6th "S" for "Safety" and the 7th "S" is "Security". These two new points' objective is to make a safe workplace for all employees. It is the employer's responsibility to provide safety and security for both factory and office place in the apparel industry.

HR (HUMAN RESOURCE)

The textile sector accounts for 4% of the country's GDP. The Indian textile industry is worth USD 55 billion out of which 64% caters to the domestic demand. This sector contributes 16.63% of the total export earnings of India. It is also the 2nd biggest employment generator after agriculture. The role of HRM has become an integrated part in these Industries for their better survival in the global Market. These Industries are facing stiff competition because of lack in modernization in comparison of growing countries like China, shortage of human resources and to a great extent because of improper management.

No youth dreams to be a Textile Engineer. Whoever has taken this profession; it is as a least preference or may be without any option. So, the time has come to revamp this Industry in such a way that it should be at the top among all other core engineering sectors. Starting from the recruitments, the talents and

merits are to be given preferences and the people are to be trained with feels of responsibility, ethical values and discipline. The awareness and work culture are to be taught at all level.

MERCHANDISING

Merchandiser is the interface between Buyer & Company. He is the responsible from order analysis to shipment. So Merchandising is the very valuable department in the Apparel Industry. The merchandiser is the person whose responsibility is to execute the orders perfectly as per the costing and pricing. Merchandising department is the star of the department among all the working departments in the Export concern, because Merchandising is the only department having maximum control over the departments and total responsible for Profit and loss of the company. After LPG (Liberalization, Privatization & Globalization) the business gets more important and now merchandising is on its hot seats. So, it is necessary to understand the day-to-day happenings of the star department.

- Merchandise- means goods bought and sold; and trading of goods.
- Merchandising- is an activity of selling and promoting the goods.

a. What does a Merchandiser do

Merchandiser is a person who interacts with the buyer and seller, and also puts efforts into proper relation between buying offices/ buying agents/ agency and seller/ exporter in terms of executing an order.

b. Merchandiser in garment industries

In the field of marketing and services, Merchandiser is at a position of utmost importance, He is the person who co-ordinates with various departments for a uniform business.

Objects of Merchandising

Merchandising denotes all the planned activities to execute and dispatch the merchandise on time, taking into consideration of the 4 Rs to replenish the customer.

Right Quantity: To dispatch right quantity of product what buyer ordered.

Right Quality: It should be with right quality as accepted both parties.

Right Cost: Everybody wants more from what they are paid.

Right Time: No one wants to wait idle even in a Restaurant. Keeping delivery schedule is mandatory.

Qualities of Merchandiser

Communication Skill: The communication is very much important to promote the business activity. The merchandiser should remember that communication must be lucid and should have face to face conversation with the buyer.

Planning Capability: Merchandiser should be capable of planning, based on the plan the order is to be followed. If the planning is not done properly, it will directly affect the delivery time of the order.

Decision making: For a Merchandiser, decision making power is most important. He should think about the decision to be taken and to act in a right way.

Loyalty: Loyalty is an essential character of human beings. Especially for the business people like merchandiser it is a must.

Knowledge about the field: Merchandiser should have adequate knowledge about the garments, Computer knowledge, and technical knowledge to communicate with different people in the business is a must.

Co-ordinate & Co-operate: Merchandiser is the person who is actually co-ordinate with the number of departments. To Co-ordinate with different people in the industry he should be co-operative.

Monitoring ability: Merchandiser should monitor to expedite the orders.

Other qualities: Education, Experience, Situational Management, Ability to Evaluate, Dedication, Knowledge of expediting procedures.

Function of Merchandisers

- Developing new samples, execute sample orders
- Costing
- Programming
- Raw materials / Accessories arrangement
- Production scheduling (or) route card drafting
- Approval of various Process, Pattern and size set
- Pre production follow up
- Meet Inspection Agencies
- Production controlling
- Identifying shortages and make arrangement for the shortages
- Following quality assurance procedures, quality control procedures
- Monitoring the in-house, sub-contractors and junior activities
- Buyer communication

- Communication with sub-contractors, processing units & other 3rd parties
- Proper reporting
- Highlighting to the management
- Record maintenance
- Developing samples
- Placement of orders to suppliers
- Taking measures for consistent production
- Taking preventive action to maintain the targeted performance in all areas of activities
- Attending meeting with superiors and furnishing the required details about merchandising.

Important Duties

- Costing or Calculating Garment Price
- In many companies, costing is done by costing officer & CEO. But in some places, it is done by the Merchandisers.

Some important terms in costing

- Yarn cost
- Process cost
- Process loss
- CMT (Cutting, Making & Trimming)
- Negotiation (getting the best out of a deal)
- Commission percentage (%) for Middle man
- Shortage
- Buyer specification (It is buyers' responsibility to specify the quality required)
- Quantity
- Currency
- Mode of Shipment (sea, air)
- FOB (Free on Board)
- CIF (Cost, Insurance and Freight)
- OH (Over head)
- Quota (Not applicable nowadays)
- Profit (level of %)

One of the Major responsible jobs handled by Merchandise department is Quality Control

TEXTILE TESTING & INSPECTION

TESTING

(1) Analyzing: Analyzing is one time process, which takes place at the time of confirming the order with the Buyer as well as the raw material quality. Total cost of the garment is definitely based on the raw material quality & composition. Ex: Count & Construction of the yarn used in the fabric or garment, Fibre composition of the raw material, Type of Dye or print used in the garment, etc.

(2) Testing : Testing is a process to understand, the quality of the produced item meets the requirement of the buyer. Testing is done on every lot or selected lots or wherever buyer asked.

INSPECTION

Inspection is the visual examination or review of raw materials partially finished components of garments and completely finished garments in relation to some standards, specifications, or requirements as well as measuring the garment to check if they meet the required measurement.

Types of Inspection

1. Incoming material inspection:

After fabric is received, the same should be inspected for the following purpose GSM

- Dia
- Shrinkage
- Color Streaks
- Color matching

2. In - process Inspection: Inspection done in between any process or in between any sewing operations, this may be on partially finished (or) semi-finished garments.

3. Flip checking: Inspection done in between by the operators or by is assistance during the sewing operations before the garments are bundled.

4. Patrol inspection: Inspecting activities of a particular area or line. It is called as line supervision.

5. Pre-Final Inspection: It is done to the final inspection merchandiser or QC or both can do pre-final Inspections. After pre-final inspection if garment is passed. It will send to final Inspection. After final inspection only, the decision of passing or rejecting is made.

6. 100% Inspection: Inspection should be done in 100%. In the inspection center.

7. Original of final Inspection: First time inspection of the packed merchandise goods is called original inspection. If QC are gratified with the quality of merchandise. We can pass a lot, if quality of merchandise is not up to the standards, rechecking should be done. Again, it should be produced for re inspection.

8. Final Random Inspection: It is random inspection done according to the customers individual requirements. Standard after the shipment have been completed, packed and ready to ship. Colour appearance, workmanship, style etc will be checked against the customers specification.

Inspection Parties

a) Internal Quality Controller

Inspection done by the Company internal quality control to check the quality parameters before to Final Inspection.

b) Quality represented by buying Agencies

Inspection done by buying Agencies quality control to check the customer requirement.

c) Third Party Inspection

Inspection done by third party like SGS or ITS.

NSIT (New Style Integration Team)

- Developing new projects as per the customer requirements – Design, style, measurements.

NSIT PROCESS

- Style Information- style information is the process of getting details about the new style.
- T & A – Time and Action.
- Process Routes.
- BOM (bill of material) & CC- chart (color component chart).
- Provisional Tech Park- rough copy for the new style.
- Seasonal RA points- for every season RA (risk analysis) discuss with external designing team/ Mater team.
- Folder Checklist and Availability-machine attachment availability.
- Kegel availability-legal is a moulding part which used in melding machine to make 3-Shape (cup shape).
- Visual sample and fit comments.
- RA meeting with MAST-Risk analysis meeting with internal team.
- Risk mitigation (PDRA)-Production risk discus with internal team (High risk or Low risk).
- New style meeting minutes and follow up.

- CRM (critical risk meeting).
- Red flag- Critical to quality.
- Historical Data- FID comments.in this process they analysis old style detail's which is similar to the new style.
- Red tag validation.
- Pattern validation- Pattern checking.
- Thread sheet validation-Thread color analysis.
- New style- AD (Article Description) discussion minutes
- ECRS (Eliminate, Combine, Rearrange& Simplification) and Kaizen.
- Final tech pack, AD and STW & CTQ.
- Inline measurement.
- Call outs- critical quality issues- discussed with design team.
- FID comments- size set and fit comments and deviation.
- Pilot & TLT report.
- Trims(accessories) reports (inline & end line)
- Pre-Production meeting minutes and follow up action.
- First Bulk Approval report.
- TNA adherence- Target vs Actual.
- QCO report- eff/ AQL/ design related issues.
- Post QCO report- reason for the failure report.

When the NSIT completed their process and the style of the pattern and required fabric, accessories details they give to the planning team.

]

PLANNING

As per the conformation of NSIT planning department involves everything from scheduling each task in the process to execution and delivery of production. Production planning and control is one of the most important aspects of the garment manufacturing industry. Precision in planning equates to on-time shipments, the best use of labor and assurances that appropriate supplies and equipment are available for each order. Production planning involves everything from scheduling each task in the process to execution and delivery of products.

Keep Costs as low as Possible

Garment manufacturers can't afford to lose time or materials in the production process. Lost time can lead to late fees when products aren't delivered as promised. Buyers quickly find other companies to replace manufacturers who can't deliver, and in an industry that already faces tight competition, you can't take that chance. Raw material prices rise consistently, and poor planning can lead to missed opportunities and higher costs. With styles changing rapidly and vendors making increasingly smaller orders to keep up with changing trends, the planning phase of each production piece must be as accurate as possible.

Reduce Loss

About 60 to 70 percent of the cost of a garment is in the fabric, according to Stitch World. As such, it's vital that you order appropriately and track your cutting room processes to keep mistakes to a minimum. Effective production planning relies on your ability to order the appropriate amount of fabric for a run and realize no more than a 2 to 3 percent rate of error in cutting. That means that the number of garments produced should equal 97 to 98 percent of the garments cut.

Deliver Timely Shipments

Early delivery can be as harmful to your company's future as late delivery, because buyers then must accommodate early deliveries with additional storage capacity. Ideally, your planning should allow for exact delivery when the customer demands. At the same time, you need to have sufficient labor and raw material delivery in the exact proportions to meet the deadlines without having to pay extra for overnight material deliveries and labor overtime. According to Stitch World, the trend in the garment industry is to demand shorter and shorter lead times between ordering and delivery; manufacturers who can meet short lead times have a distinct competitive advantage.

Follow Up Daily

Once you set plans for a garment run and delivery deadlines for each task in the process, you must institute strict follow-up procedures to ensure your plan is being followed correctly. If the cutting room

falls behind in its production schedule, for example, you're sewing and finishing lines must wait, leading to potential backlogs and missed deadlines for shipment. To avoid lost time in the production, you must provide daily oversight of each step and keep the rest of the line updated with any delays so plans can be adjusted to pick up any slack.

PRODUCTION & CAPACITY PLANNING

Effectively planning your production to ensure that capacity and product demand match affects your company's profitability. When you predict how many products you will sell, plan for adequate capacity and develop production schedules that run without delays, you eliminate unnecessary costs. The key is to identify information sources yielding reliable data that allows you to predict accurately the levels of production and the scheduling you will need.

Past Performance

If there have been no major changes in your company's situation, the most reliable way to schedule production and plan for capacity is to use data from the previous planning cycle. Depending on whether your production levels and demand were increasing, staying the same or decreasing, you can extrapolate the trends to carry out you're planning. For example, if your demand has been increasing by 10 percent per year, you can plan production for the coming year by adding workers and equipment to increase capacity by 10 percent, or you can schedule longer runs, possibly with overtime, to produce the extra products.

Marketing Projections

Your company plans are often based on changed assumptions coming from your marketing strategy. For example, if your strategic plan is to gain market share by increasing production volume, lowering costs and competing on price, your marketing strategy predicts your increased sales volume and lower costs. To meet this increased volume and achieve the cost savings, you have to make sure you have the required capacity and can schedule work without generating overtime or waiting-time costs. Production planning to meet the anticipated demand projected by your marketing strategy is vital for meeting overall company goals.

Orders Received

When marketing projections are uncertain or the costs involved for adding capacity are high, it makes sense to keep some flexibility in the planning. Before committing to a capacity increase by hiring extra workers or adding production equipment, wait until the company receives orders for the products,

allowing you to predict more accurately what capacity levels you will require and allowing you to plan production with increased confidence. Typically, you prepare for the projected changes in capacity and have revised production schedules ready but only carry out the changes when the level of orders received confirms the projections or forces you to make revisions corresponding to actual demand.

Advance Sales

In some cases, adding capacity to a production line and changing the scheduled production runs takes more time than the delivery time of the products. Waiting for orders received to confirm increased demand means that you are already too late to fulfill the extra orders. Advance sales offers an opportunity to test the market and obtain additional data on the validity of projections. Your strategy predicts levels of sales that you can apply to a smaller campaign for advance or test sales. Advance sales information lets you plan your production and adjust your capacity to projected sales levels that advancesales numbers have confirmed or modified.

PRODUCTION PLANNING PRINCIPLES

Production planning takes anticipated capacity requirements and translates them into needs for specific production elements. It allows a company to fulfill sales projections in an efficient manner while maintaining quality. Small businesses have to plan their production carefully to make the best use of their limited resources. You can classify the principles of production planning by their functions and by the production elements they affect. A sound production plan uses reliable forecasts to assign resources and control the resulting output.

Forecasting

Before you can plan to assign resources, you have to know how much to produce. Companies typically base capacity estimates on projected sales figures coming from sales and marketing. The forecasts consist of a target and a possible variation. Production planning focuses on the principle of meeting the target in the most efficient way possible while keeping open the capability to respond to variations in demand.

Materials

To fulfill your production target, you must have the materials needed to produce the goods on hand. The most efficient production planning keeps the minimum materials in inventory. Production planners evaluate how much material the company needs, the lead times for orders, the delivery times for

suppliers and the reliability of the supply. While just-in-time supply is a desirable principle, production planning has to balance this strategy against the more damaging possibility that the production line might have to shut down because of a lack of supplies.

Equipment

The production planner takes into account the capabilities of the equipment used to produce the output. A basic production principle takes the historic output of the equipment, applies a safety factor and uses that to predict actual capabilities. If a production planner foresees a capacity requirement beyond the capabilities of the equipment, he investigates the acquisition or leasing of additional equipment or capacity. After the influences of such additional capacity on costs is established, the information is used in the decision whether to proceed or reduce the forecasts.

Manpower

Manpower planning requires accurately estimating the number of employees required to do the work. A basic principal plans for the number of workers required to fulfill the target and uses overtime and layoffs to compensate for variations. The capacity of the workforce has to match the capabilities of the equipment to plan for the highest efficiency. Manpower planning also uses historical data to adequately project time lost due to sickness and employee turnover.

Processes

Effective production planning makes sure that the processes used for the output continue to operate efficiently and safely. Often the normal operation of a process requires occasional testing and adjustments. Production planning principles require that such procedures are up to date and, if required during the planned production run, the plan allocates the necessary time and resources. If the company is bringing a new process on line, production planning ensures that it is tested and ready for operation when the planned production run starts.

Controls

A final production planning principle puts in place controls that detect problems as soon as they occur. Verification of inventory, use of qualified suppliers and personnel, standardization where possible and frequent testing of intermediate and final outputs can prevent quality problems and production delays. When controls are in place and production planners become aware of a problem, their plans include possible corrective actions to minimize the effects and return production to the required levels.

RMWH (Raw Material Ware House)

This is a department which collect the raw materials such like fabric and accessory and also check the quality of fabric and accessories. They store the product when it arrives, they check the fabric quality and they send it to the production department. And they send the accessory to the sewing team.

Textile and clothing industry warehouse storage systems

Textile and garment sector where change and speed are at the forefront, storage activities of industrial racking systems and pallets of all its products on the shelf, steel shelf, textile products storage maintains safety according to the rules. Textile companies' warehouses, raw materials to be used during production, maintenance repair consumables and spare parts used in maintenance operations together with auxiliary materials possession. Today, conditions such as the technology superiority and production capacity of competitors make it imperative for companies to develop their systems. In conditions of increasing competition day by day, it is of great importance for companies to keep their customers and constantly win new customers, meeting the needs in a timely manner by accurately determining the needs point. In this way, customer satisfaction will be achieved by gaining advantage in the sector against competitors. The textile and garment sector should provide high performance product shipment to its stakeholders in the supply chain of textile products. To ensure this performance, real-time warehouse management is required at 100 percent accuracy. The most preferred storage rack system model in the garment, garment and textile manufacturing sectors are automated warehouses offering high-speed storage. Also known as smart warehouses, these systems are high-tech software and fully automated storage systems where the fast storage lifecycle is managed. Warehouse Shelf Systems Bursa with its powerful technological warehouse solutions, which focuses on customer confidence and customer satisfaction with the power of its competent staff, unique project management project models – Mustafakemalpasa offers all over the world from its production facilities.



Figure2.1(Rolls in MQA)



Figure 2.2(Roll in MQA)

PRODUCTION DEPARTMENT

The production department is responsible for converting raw materials and other inputs into finished goods or services. In between the processes of production, the department works to improve the efficiency of the production or assembly line so that it can meet the output targets set by company management and ensure finished products offer consumers the best value and quality.

Production department is the main task in the whole organization. Process which involves in production:

Spreading



Laying



Marking



Cutting



Sewing



Checking



Packing

Identifying inputs

A business determines the quantity or volume of goods that should be produced within a certain time frame and passes the information to the production department. To meet production targets, the department establishes the quantity of raw materials and types of machinery and equipment required to achieve the desired output level, and may collaborate with the purchasing department to source the inputs. If there isn't sufficient manpower to support production process, the production department asks the firm to hire more personnel.

Scheduling production

With the inputs ready, the production department schedules production processes. This involves planning the tasks to be completed along the production line and allocating the tasks to various production workers. In a woodworking business, for example, the department determines how long

lumber will be allowed to dry before being moved to the machining stage for sawing and bending into shape – and finally through the assembly and finishing stages.

Minimizing production costs

The production department is tasked with finding effective ways to lower production costs. One simple way to do this is to keep the production machinery and equipment well-maintained so the firm does not regularly incur repair costs. Along with advising the business to adopt newer technologies, the department can also assess the production line to identify opportunities for cost reduction. For example, if the type of wood used a long time to air-dry – requiring an investment in wood dryers – it could be less costly for a furniture manufacturer to purchase dried lumber.

Ensuring product quality

A production department must ensure finished goods meet minimum quality standards. Apart from checking all products for faults as they move through the production process, the department must perform rigorous tests on prototypes for new products to ensure they meet quality benchmarks before undergoing mass production. Techniques such as waste elimination and process standardization also help to ensure and improve product quality.

Improve existing products

From time to time, the production department will furnish the research and development department with information it can use to improve existing products. For example, when the production department of a smartphone manufacturer notices that the material it uses to make phone casings bends when subjected to some pressure, the department must advise the research team so that it can seek stronger materials.

Functions of Cutting Department in Garment Industry

The cutting department is responsible for cutting fabrics for the garment orders and feeding the sewing department with cuttings. The cutting department's capacity is planned based on the daily feeding requirement of the sewing lines. The cutting department is set up with a cutting department head, cutters, spreaders, cut parts quality checkers and helpers for sorting, ply numbering and bundling.

The major activities and functions of the cutting department are explained in this post.

1. Take fabric from the fabric store:

The cutting department gets a cut order plan from the production manager. According to the cut plan, the cutting in-charge generates a fabric requirement sheet or requisition slip to the fabric store to issue fabrics.

The fabric receiving process from the fabric store may be done on the same day of the cutting or one day before the cutting schedule.

2. Relaxation of fabrics:

Knitted fabrics require relaxation before cutting. After receiving the fabric from the fabric store, the cutting department opens the fabric from the fabric roll and lays it on the table for relaxation for some hours before cutting. Factories also relax fabric in the fabric store overnight after opening the fabric rolls. This process helps in controlling fabric shrinkage. This activity is not required for all types of fabrics.

3. Cut order planning:

The cutting master plans the number of markers they need to prepare, the size combination to be set for each marker and the number of plies to be laid in each marker.

4. Fabric Spreading/layering:

In mass production, multiple layers of fabric are cut at the same time. So spreaders lay the fabric on a cutting table as per total marker length. The layer height is kept up to a certain inch.

5. Planning markers:

The cutting master plans marker ways, marker lengths and the numbers of plies to be laid in each lay.

6. Making markers:

This is a process of making an outline of garment patterns on the lay for cutting garment components. After layering, the marker paper is laid on the top of the layer. Those factories that don't have CAD markers make markers manually using paper patterns.

7. Cutting fabrics:

After making the marker, garment patterns are cut and taken out from the layer. Various technologies are used for cutting fabric layers, such as straight knife cutting, band knife machine cutting and a

computer-controlled automatic cutting machine.

8. Sorting, bundling and numbering of garment plies (parts):

After cutting the fabric, layers are sorted size-wise and colour-wise. Each ply is numbered using stickers. Bundles are kept on inventory tables, before these are sent to undergo the next process.

9. Inspecting cut components:

To maintain the cutting quality, standard cutting components are checked randomly by quality checkers. If defective components are found, they replace those defective parts.

10. Sorting printed and embroidery panels:

As per order requirements, printing and embroidery is done on cut panels. Size-wise sorting is done after receiving printed and embroidered panels. The checking of printed and embroidered panels is also done by the cutting department

11. Re-cutting panels:

Re-cutting is done for garment components that require to be replaced in bundles. Re-cutting requests are received from the sewing department for defective garment parts. Re-cutting is also done for block panels cut for the printing and embroidery processes. After receiving garment panels from the printer or embroiderer, these panels are reshaped.

12. Fusing garment components:

Fusing in garment components is done to stiffen parts of a garment. If needed, fusing is done at the cutting section (e.g., fusing of the collar and cuff components of formal shirts).

Functions of Production Department in Garment Industry (Stitching Department)

In the garment industry stitching section is considered as production department. Though fabric cutting and garment finishing sections are part of the garment production department. In this post, I will explain the function of production department.

The main function of the production department is stitching garments. But there are many associated

activities performed by the production team to run the production floor smoothly. The major tasks of this department are described here but are not limited to these only.

1. Style Analysis

The line supervisor analyzes the garment construction of the style to be loaded to the line. He calculates the machine requirement for the style, based on the garment construction.

2. Estimating labour costs

Line supervisors calculate the estimated cost per operation. In the piece-rate-production system, the supervisor sets piece rates for stitching operations. Those factories that have industrial engineering departments calculate direct labour costs based on the standard allowed minutes (SAM) to produce a garment.

3. Planning and scheduling floor level production

The floor in-charge and line supervisors plan the daily production output. They take information on upcoming orders from merchandisers or the planning department and plan manpower and machine requirements in advance.

4. Setting the line

Line supervisors set the sewing line for new orders. Line setting involves the tasks of placing sewing in a sequence, by allocating operators to each machine, giving work to operators and helpers and giving instructions to operators on how to undertake operations and the required stitching quality.

5. Stitching garments

The sewing department stitches garments and makes clothes. Operators sew garments using different types of sewing machines. An operator can be given single or multiple operations to sew.

6. Balancing the assembly line

To get maximum production from the line, line supervisors balance line by adding additional operator, or by clubbing operations. Read this article to learn about line balancing.

7. Marking parts

Marking is done on the garment component needed to point a position from where the stitching is to be done. Helpers mark on garment parts as per process requirement by using marking chalk and magic marker.

8. Ironing garment components

Garment components might need to be folded and ironed prior to stitching to improve seam quality. Portable irons are used for ironing on garment parts.

9. Checking stitched garments:

Garments are checked in line and off the line. The purpose of checking garments is to reduce defect generation from the line. The end-of-line checker segregates defective pieces from the good pieces. Read quality checking procedures in garment production.

10. Stitching alteration

After segregation, defective garments are sent back to the stitching section. Seams are repaired by re-stitching. If defects are related to the fabric, part changing is done by replacing the defective component with the correct part.

11. Managing documentation

The department maintains various logbooks and records. The sewing department records the details of receiving cuttings from the cutting department and issuing garments to the finishing department. They make reports of the daily production on a line-wise basis and the manpower used in each line.

12. Recruiting operators

In most factories, line supervisors are responsible for bringing sewing operators and recruiting operators through skill assessment tests.

SPREADING

Spreading is the process of superimposing length of fabrics on a spreading table. The fabric may consist of single or multiple plies. They lay the fabric in 20 pairs each lay has 8 meters of fabric and they transfer it into cutting machine. Spreading is the process of unwinding large rolls of fabric into long, wide tables in preparation for cutting each piece of a garment. The number of layers of fabric is dictated by the number of garments desired and the fabric thickness. Spreading can be done by hand or machine. Depending upon the fabric and cutting technology, up to 200 layers of fabric may be cut at one time. Fabrics that are more difficult to handle are generally cut in thinner stacks.

Spreading and cutting is smooth laying out of fabric in superimposed layers or piles of specified length. The cutting marker is laid on the topmost layer. The maximum cutting width is the usable fabric width minus selvedge or needle marks caused by stencil marks. Fabric utilization is the amount of fabric actually utilized in the marker as the percentage of the total fabric area.

Types of Spreading

- Auto machine spreading
- Manual spreading

Precaution needed while spreading the fabric

- Alignment of piles.
- Elimination of the fabric defects.
- Remove the crinkle from the fabric.
- Correct the ply direction.

Types of Lay Plan

- **Half Garment Lay** includes only half of the garment pieces, for example, one side left or right. Generally used for tubular fabrics.
- **Whole Garment Lay** includes garment pieces, left and right sides. Generally used for Open width fabrics.
- **Single Size Lay** is used using all garment pieces of one single size. Disadvantageous as the consumption of fabric is higher.

Types of Lay

- **Single Ply** is a single layer of fabric generally to make samples
- **A multiple Ply** is a number of fabric layers stacked on one top of other
- **Stepped Lay** is multiple lays in which groups of layers have different lengths generally used for getting best utilization and consumption of fabric.

Forms of Spreading

- **One Way Cutting** is when the fabric is laid the same way up with grain or print pattern running in the same direction. The fabric has to be cut at the end of each ply.
- **The fact to Face Cutting** is when the plies are laid in pairs face to face. The grain or pattern runs in the same direction.
- **Two Way Cutting** is when plies are laid continuously from left to right and right to left without cutting at the end. Most Efficient method of spreading. Cannot be used with grain restrictions or one-directional printed fabric.

Completely manual laying-up

This is the most extensively used method in our country because of cheap labour cost, availability of workers and comparatively less time consumed. In this method, a roll of fabric is taken and its one end is fixed at one side of the table and spreading continued without using any mechanical assistance. A large number of workers is required to carry out this process to fulfill the requirements of fabric spreading.

Electrically driven laying-up by spreading machines

An electrically driven and controlled cloth spreading machine including means for reversing the travel of the machine, means for controlling the high and low speeds of the machine, means for causing the machine to fail safe at low speed upon power failure and open circuit conditions caused by different changes in function of the machine.

Manual laying-up aided by spreading and cutting off devices

The fabric in roll form may be supported to a frame and carried along the table where the end is secured by weight or by a clamp. The operators work back from the end aligning the edges and ensuring that there are no wrinkles or any extra tension. The ply is normally cut with hand shears or with a powered circular knife mounted on the frame. This system of spreading is suitable for checks or striped or other regular repeating patterns.

Manually driven, mechanized laying-up using carriages

Spreading machine carries the piece of fabric from end to end of the spread dispensing one ply at a time onto the spread. There is a frame or carrier wheels traveling on guide rails at the edges of the table, a fabric support and guide collars to aid the correct unrolling of the fabric. In the sampler versions, the operators clamp the free end of the fabric in line with the end of the spread, push the spreader to the other end, cut off the ply in line with that end, clamp the beginning of the next ply, push the spreader to the other end and so on.



Figure 3.1(Automatic spreading)



Figure 3.2(manual spreading)



Figure 3.3(Automatic spreading)

PATTERN MAKING

In the apparel industry concerns, pattern making section is the backbone of the apparel industry. As a matter of fact, a good garment is born on pattern maker's table. Pattern makers must be well versed in anthropometrical data of human body measurements. Experienced with the garment construction techniques. He/she must have a thorough knowledge of preparing the patterns based on buyer's requirement measurements called as specification-sheet. This method is termed as the industrial pattern making.

There are many types of patterns making in usage, as follows

- Custom-made pattern making (Bespoke system)
- Commercial pattern making.
- Sample garment-based pattern making.
- Industrial pattern making.
- Flat pattern making.
- Sloper/Master preparation of pattern making.
- Flat sketch-based pattern making.
- Grading of pattern making.
- Computer-Aided pattern making.
- Computer-Aided Grading of pattern making.
- Readymade garment pattern making and
- Draped garment pattern making.

Salient Features of Apparel Pattern Maker

- Compute dimensions of patterns permitting to specification of garment sizes, considering stretching as well as the non-stretching of fabrics (woven and knitted).
- Generate the slopers/master pattern for each size. U.S. 8, 10, 12, etc within a range of garment sizes, using measuring charts, drafting, and cutting using instruments, computers, and/or grading devices.
- Pattern making software are available as mentioned below:
 - Gerber (GGT)
 - Tukka-tech,
 - Astor,
 - Tanya-geometric,
 - Reach-piece and

- Day by day newly developed soft wares are being introduced for the rapid growth of the apparel as well as the garment Industries throughout Internally.
- Create a paper pattern from which to cater the need of mass-production buyers design concept.
- Regulate the best layout of pattern pieces to minimize waste of material, and mark fabric to optimum utility of the fabric consumption accordingly.
- Discuss design specifications with designers, and convert their original models of garments into patterns of separate parts that can be laid out on a length of fabric.
- Draw details on sketched parts to designate where parts are to be joined, as well as the positions of pleats, pockets, buttonholes, and other features, using computers or drafting instruments (well versed in signs and symbols of pattern making manually as well as the computerized).
- Draw outlines of pattern parts by adapting or copying existing patterns, or by generating/drafting new dress patterns.
- Examine sketches, sample dress, and design specifications to determine quantities, shapes, and sizes of pattern parts, and to determine the amount of material or fabric required to make an expected dress.
- Mark samples and finished patterns with necessary information such as garment size, section, style, identification, and sewing instructions.
- Location and cut out master or sample patterns, using scissors and knives, or print out copies of patterns, using computers.
- Trace outlines of paper onto:
- Cardboard patterns,thick paper,Zinc-sheet,thin plywood,Transparent plastic sheets andCut patterns into parts to make as the templates.Usually, the components of Collars, Neck-band, Plackets and Pockets
- And standard garment full size with all parts often repeated as continuous orders always placed by the buyers/customers.

Special Responsibilities of An Industrial Apparel Pattern Maker:

- Scrutinize flat sketches, Design specifications to ascertain shape, Size of pattern parts, examine positions, Cuts and pattern, using scissors,Notch maker and knife.
- Professionally well experienced pattern makers are employed by apparel companies and work closely with design teams. Subject on the employer, pattern makers may be required to execute the design from the 1st pattern/Basic pattern through production must be treated as the necessary.
- Patterns are fundamentally made so that the same style can be easily duplicated when it is required and multiple pieces can be professionally made. Pattern making authorizes that never have to start from scratch while duplicating the patterns.

- In recent days the education needed to be a Pattern Maker is normally a Bachelor's Degree in Apparel Design; Pattern Makers usually study Graphic Design, pattern making software knowledge and Business or Fine Arts under graduates 40% of Pattern Makers hold a Bachelor's Degree and 37% hold an Associate Degree in recent days.
- In previous days a sample maker with sound knowledge of sewing the garment construction can be worked with the practically knowledgeable pattern maker will train the apprentice/under staff and considered to be the assistant pattern maker at least three to five years and then quit the job, shifted to a new apparel factory.
- In recent days the pattern makers are also called Technical Designers / Pattern Executives. Pattern making is measured as the first step in **garment production**. While making a garment as per design, templates are used to trace the various garment parts of similar style onto fabric prior to cutting and assembling.

To generate a different pattern, a pattern maker must have to follow five essential steps:

Gathering their material, taking proper measurements, adding styles and designs, grading their design, then **Draping** it to result in the final garment.

Pattern Making Process:

The making of precise image of each part of a garment with flat hard board paper is called the pattern is the true factor. The first step in apparel production is the creation of design and construction of patterns for the components of design. Besides, pattern making process is one of the most important tasks in garment / **apparel manufacturing**. Flat sketch / garment silhouette being transformed into fashionable garments by **pattern making techniques** and therefore it is like a bridge between the design and production. Separate patterns (Major parts and component parts) are joined together and form a garment. These patterns are used for drawing all the parts of a garment on cloth or on marker paper before the cutting of the fabric. (**Marker planning**) If lining or interlining is used in the garment, then for that purpose also patterns are to be made by the pattern maker. For making garments patterns specialized knowledge and efficiency is required on talent, apparel technical facts, capacity of analysis of garments designs and on technology of garments making. The patterns are used in fashionable garment making industry are produced mainly in two stages which are called Block pattern and Garment pattern.

1. Block pattern:

Block pattern or basic pattern means the actual pattern which is fitted to a certain standard body structure but without any specific construction for attractive enhancement, design or style. Based on the average measurements of Young, Adults, Tall, Short etc.

Group of men's and women's, block patterns are made. Different block patterns are also made for the kids based on their age. Block patterns are made in two ways as described below:

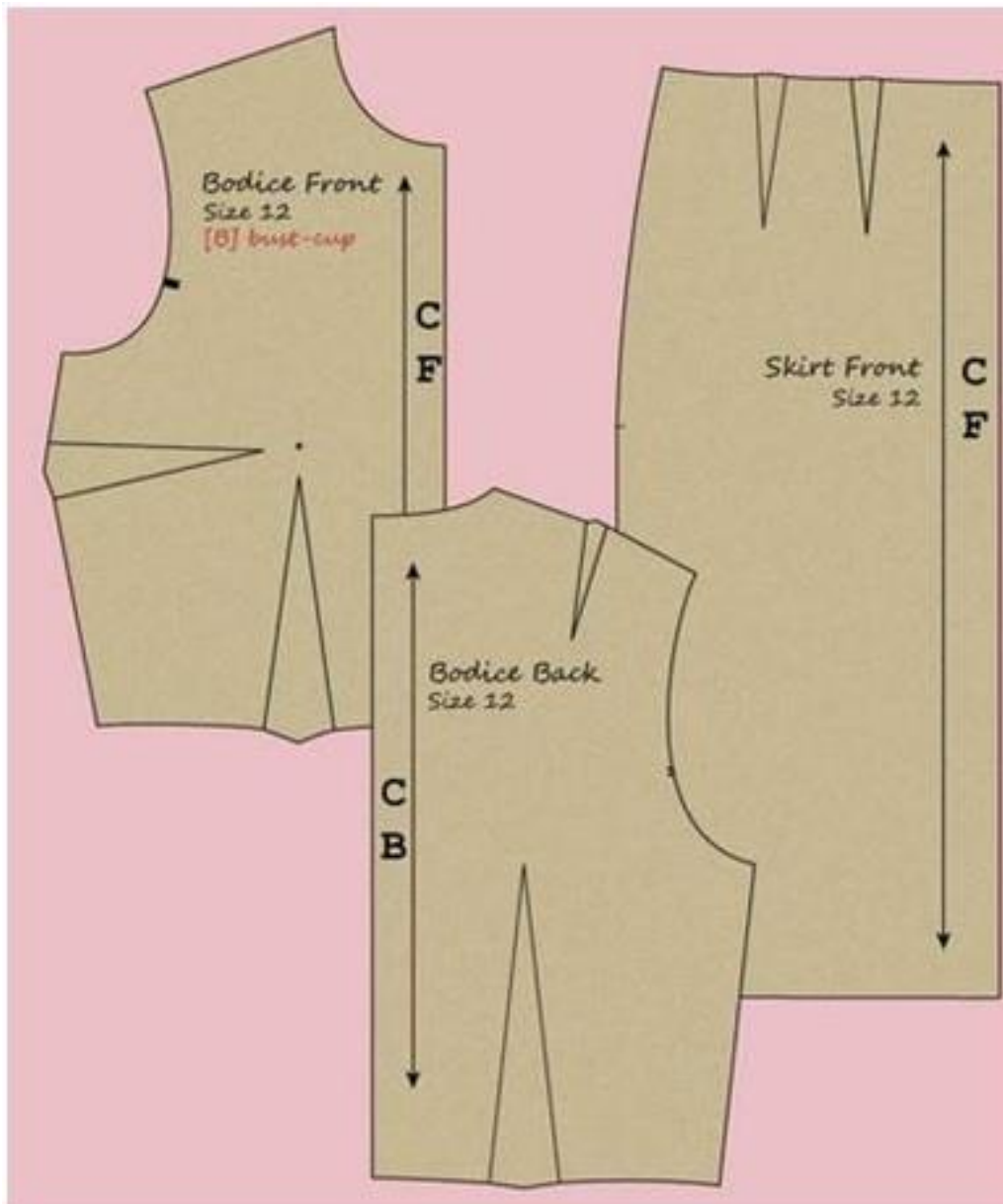


Figure 1(Block pattern/sloper)

Flat method: The pattern of various parts of a garment, especially the body (Front and Back, sleeves, skirt front and back) Usually called as “Five Slopers” are made through technical drawing. In case of technical drawing, the rules and their application procedure of the human body measurements and their proportionate rates are dependent on pattern maker.

2. Garment pattern:

This type of patterns may also be made through computer in the present age of computer domination. In case of basic pattern making process through computer, pattern making programs are saved in computer discs. Flat method has been evolved mainly from modeling system and in this system; patterns can be made so easy with time consumed quickly.

Modeling: For garments pattern making process, modeling is the first and actual system and in garments industry it is still widely used system. In this system, a block fitted with the standard body of a model is made, which is called the Toile in British and Muslin as U.S. This toile is used in the body of the model and it is made sustaining modification and balance with the body of the model. Then the toile/muslin is removed from the body of the model. Then each of the parts of the toile is drawn separately on moderately harder paper or board paper. Patterns made in this system become very accurate but it takes much time. Block patterns are made in flat method or modeling system and garments patterns or working patterns are made based on basic block. Each block pattern is kept on board paper and its copy is made with the help of pencil/marker pen.

Then with the copy of this block pattern the following things are to be specified are as follows:

Sewing allowance, trimming allowance, Center front line, Center back line, Button hole, Button attaching position, Dart, Pleat, Shirring, and Gathering.



Figure2:(pattern CAD/CAM machine)

Introduction to Computer Aided Design (CAD)

CAD is a set of software tools compiled in a computer application to assist product designer in creating a virtual representation of the artefacts they are designing. It helps in giving dimension to any design, experimenting changes on it, configuring the design according to needs, archiving the design, exchanging of data and information related to the design between teams and organization, adding progress of the designs for future analysis, assisting tool for product manufacturing by means of a computer system which may include both hardware and software. The long and cumbersome process of designing has now been converted to a mere simple process on a computer system. CAD can be used to design curves and figures in two-dimensional (2D) space; curves, surfaces, and solids in three-dimensional (3D) space. Even a 2D design can be converted to 3D for a better representation of the design. The output of CAD conveys information, such as materials, processes, dimensions, and tolerances, according to application-specific conventions.



Figure 3: CAD in apparel industry

Features of a CAD Software

The application of CAD is vastly incorporated in various types of industries ranging from manufacturing, aerospace etc. to designing of garments, textiles, machines, layouts, architectural structures. The application of CAD software is thus based on certain features of it which can be classified as:

1. Solid Modeling:

With CAD solid components of desired shapes can be made virtually by joining, cutting, trimming different solid volumes. The final solid model comes out to be an exact replica of the actual shape, but it can also be seen and rotated like the real product. It even allows us to get inside any 3D model to inspect it from the inside. With this, any model can be constructed using parameters like measurements, physics etc. and can be edited at any point of time be it undoing or modifying it keeping the original as it is.

2. Surface Modeling:

With CAD, solid components can be given texture, details by trimming, stitching and joining different surfaces to create the final shape of the model.

3. Assembly:

With CAD, assembling of the models created in solid or surface modeling can be done to get an overview of how the product will look in the final assembling allowing us to make changes accordingly. It is also used to see actual fittings and the working of the assembled model.

4. Drafting details:

3D drawing can also be created from a 2D drawing of the components or assemblies only by providing the parameters and dimensions.

5. Reverse Engineering:

Real components of any design can be converted into 3D CAD model with instruments like laser scanner, white light scanner, CMM (coordinate measuring machine) etc. The CMM machines are used to measure or decode the shape of any real model. The virtual model created can be used for any modification purpose, shared, and documented. Later it is updated to the final model.



Figure4:(pattern CAD/CAM machine)

CUTTING

It is the process which cut out the pattern pieces from specified fabric for making garments. They place a fabric and the pattern sheet (which they got from CAD department) on the Auto cutter table with thin plastic cover which will not make fabric and pattern move. Manual cutting process is done by using a knife, scissors, drill, the knife is placed in the head of the cutting machine. This process is used for cut the small meters of the fabric.

Types of cutting:

- Auto Cutter machine.
- Manual Cutting.

The first stage in the manufacturing of garments is the cutting and for that pattern, making is the base. Cutting is separating of the garment into its components and in a general form, it is the production process of separating (sectioning, curving, severing) a spread into garment parts that are the precise size and shape of the pattern pieces on a marker.

The cutting process may also involve transferring marks and notches from the garment parts to assist operators in sewing, chopping or sectioning a spread into blocks of pieces goods many precede precision cutting of individual patter shapes.

This is done to allow for accurate matching of fabric design or easier manufacturing of a cutting knife. Once the marker is made, pattern pieces must be cut out of the specified fabric, a process called “cutting.” Currently, several cutting techniques exist, ranging from low- to high-tech. Although scissors are used very rarely-only when working with very small batches or sensitive fabrics-cutting continues to be done by hand, particularly in many lower volume establishments.

Cutters guide electric cutting machines around the perimeter of pattern pieces, cutting through the fabric stack. An electric drill may be used to make pattern notches. The accuracy and efficiency of this system are considerably less than in computerized cutting systems.

Computerized cutting systems are achieving more widespread use as technology costs decrease and labor costs rise. These computer-driven automated cutters utilize vacuum technology to hold stacks of fabric in place while cutting. Cutting blades are sharpened automatically based on the type of fabric being cut. Gerber Garment Technology manufactures one of the most commonly used cutting systems.

The precision of cut: To ensure the cutting of fabric accurately according to the line drawn of the marker plan.

Clean edge: By avoiding the fraying out of yarn from the fabric edge. Cutting edge must be smooth clean. The knife must be sharp for a smooth or clean edge.

Consistency in cutting: All the sizing size of the cutting parts should be same of a knife should be operated of the right angle of the fabric layer.

factors affect the cutting process for fabrics are as follows: -

- Nature of fabric (grainline shade, twill etc.)
- The thickness of fabric.
- Design characteristics of a finished garment.
- Machines and tables used.

Production process in the cutting room

Irrespective of size; all cutting rooms use the same basic system to produce cutwork, with the raw material going through the same operations in the same sequence. Cutting production starts with the receipt of inspected raw materials, production orders and graded patterns and finishes when bundles of cutwork are issued for sewing.



Figure 4.1(computer control knife)

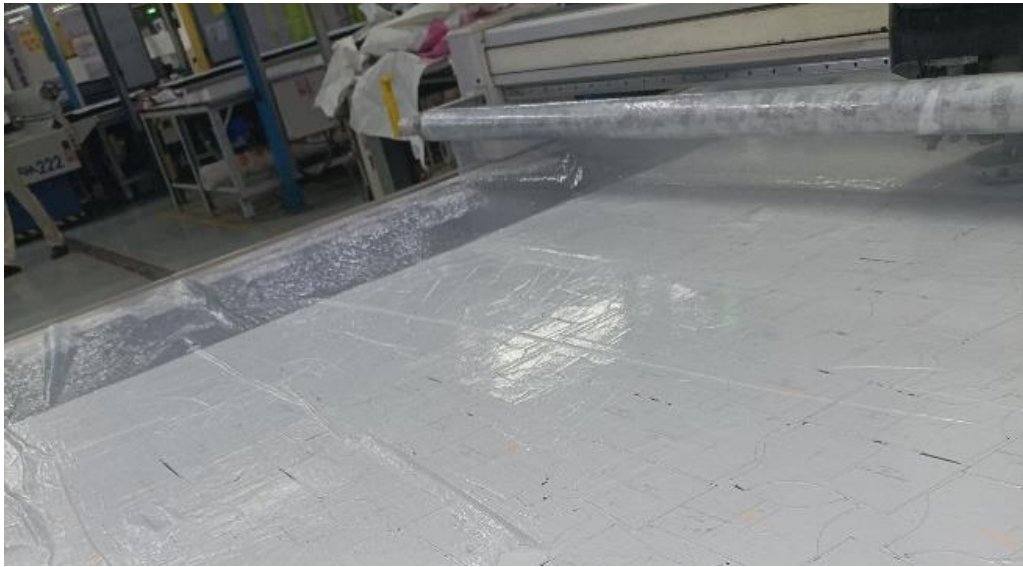


Figure 4.2(After cutting the Ply)



Figure 4.3(After cutting)

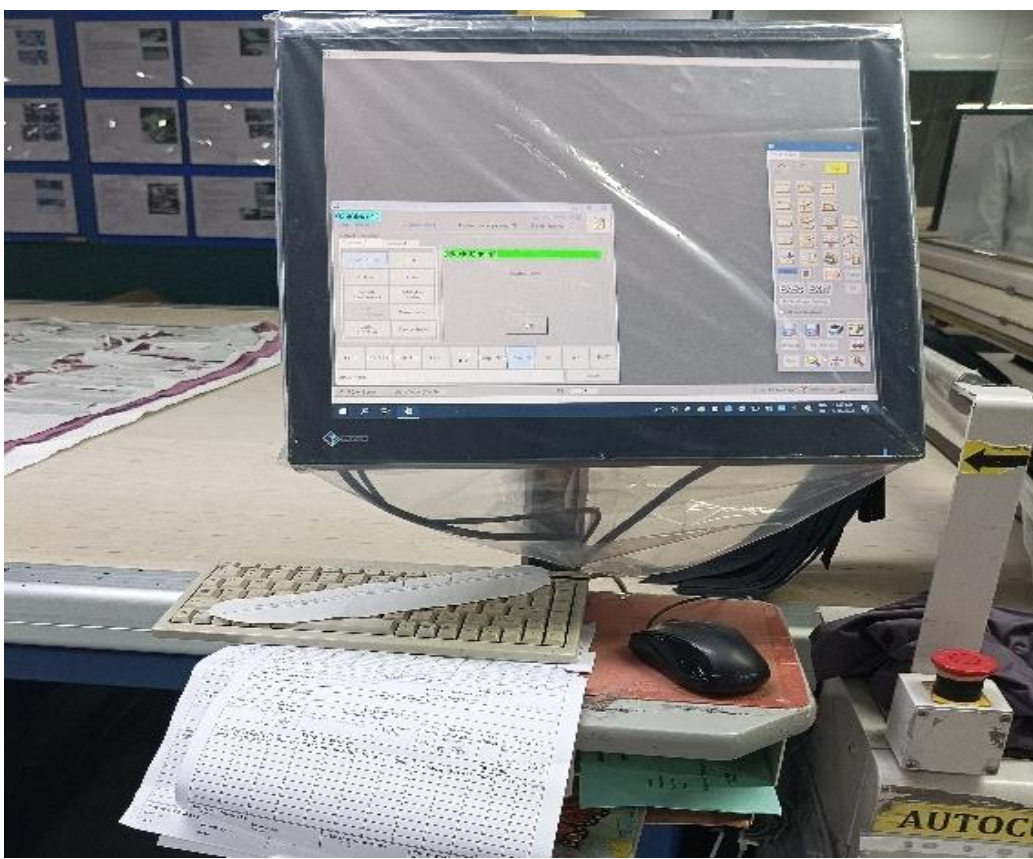


Figure4.5(Computer for auto cutter)

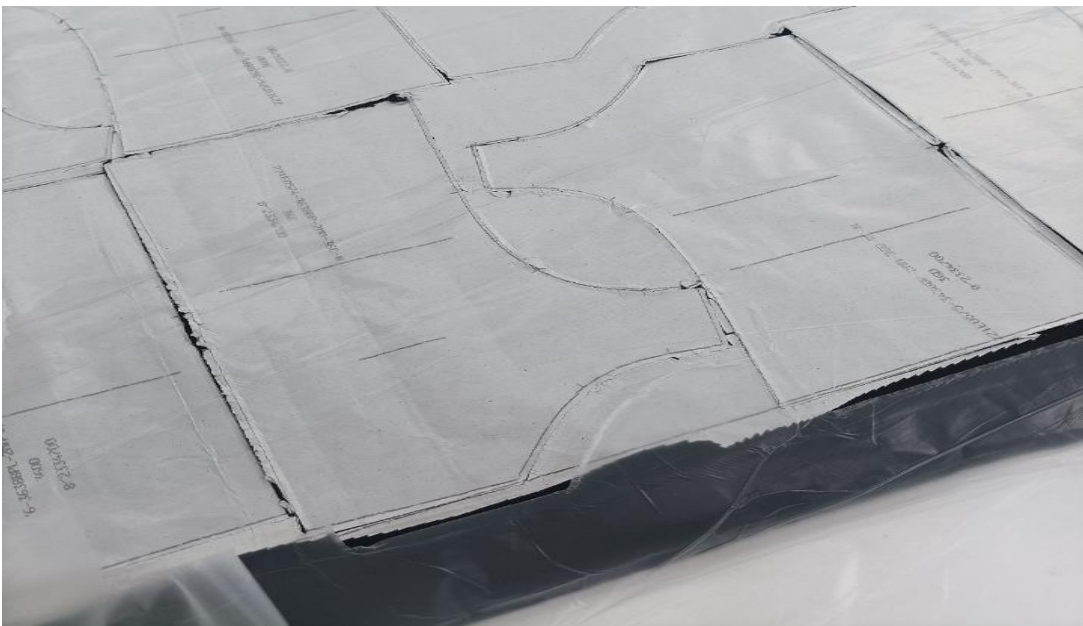


Figure 4.4(Cutting)

BUNDLING

Bundling also depends on styling and tech pack of the garments. Such as back yoke of shirt is always bundled along with back, for easy handling in sewing line and nearby cut parts. Collar two parts and collar stand two parts is always bundled together because of nearby parts and similar sewing specifications.



Figure4.6(Cutting parts bundling)



Figure 4.7 (Bundling according to size)

LABELING



Figure 4.8(Labeling)

Numbering of parts also would be planned as per number of parts in apparel multiplied by quantity daily required.



Figure 4.9 (Bundles before going line)

SEWING

After cutting process the fabric will tie with bulk and separated cutting parts are given to the sewing team. Sewing team get the pattern parts and the accessories from the RMWH and they started to stitch the pieces of fabric into the garment. There are 14-24 operations in the line for one bra Garment. The operations will differ by the style of the garment. After finishing the garment and the End control team will check the garments defects or any damage of the product.

Types of machines

- Single needle machine.
- Double needle machine.
- Over lock machine.
- Flat lock machine
- Specialized machines.

Once the garment is finished the garment will check by the many teams like END CONTROL team, AQL team and then AQL Executives.

Checking points

- Front part
- Back part
- Side seam
- Bottom
- Trims and Accessories
- Measurements
- Remove the extra thread



Figure 5.1(side seam)



Figure 5.2 (Pocket)



Figure 5.3 (waist band attaching)



Figure 5.4 (strap attaching)



Figure 5.5 (working place)



Figure 5.6 (working place)

QUALITY

Quality Control Department plays an important role in producing quality garment right first time.

Quality checking step by step:

TM (Team Members)

TL (Team Leader)

GL (Group Leader)

AQL (Accept Quality level)

FID (Final Inspection Department)

AQL is one of the most frequently used terms when it comes to quality in the apparel export industry. As most of the acceptance decisions of the apparel shipments for the export market are made on the basis of AQL based sampling plans. AQL means Acceptable Quality Level. In any business process, before accepting the finished goods from the manufacturer buyer do inspection of goods. It is so much important in export garment sector. Because foreign buyers

are so much concern about product quality. They give AQL on the product to the manufacturer. Buyers do inspection of goods as randomly process. If AQL pass that means goods are in acceptable quality level, he gives certificate to ship the goods. The AQL level varies process to process, product to product and even buyer to buyer. In the following table a sampling plan is given for final shipment inspection. Acceptance Quality Level (AQL) refers to the maximum number of defective items that could be considered accepted during the random sampling of and inspection.

The defects that are found during inspection are classified into 3 categories:

1. Critical: Must be 100% accurate. There is no range.
2. Major: Normally 2.5%
3. Minor: Normally 4%

Sampling Method:

1. Single Sampling method
2. Double Sampling method
3. Multiple Sampling method

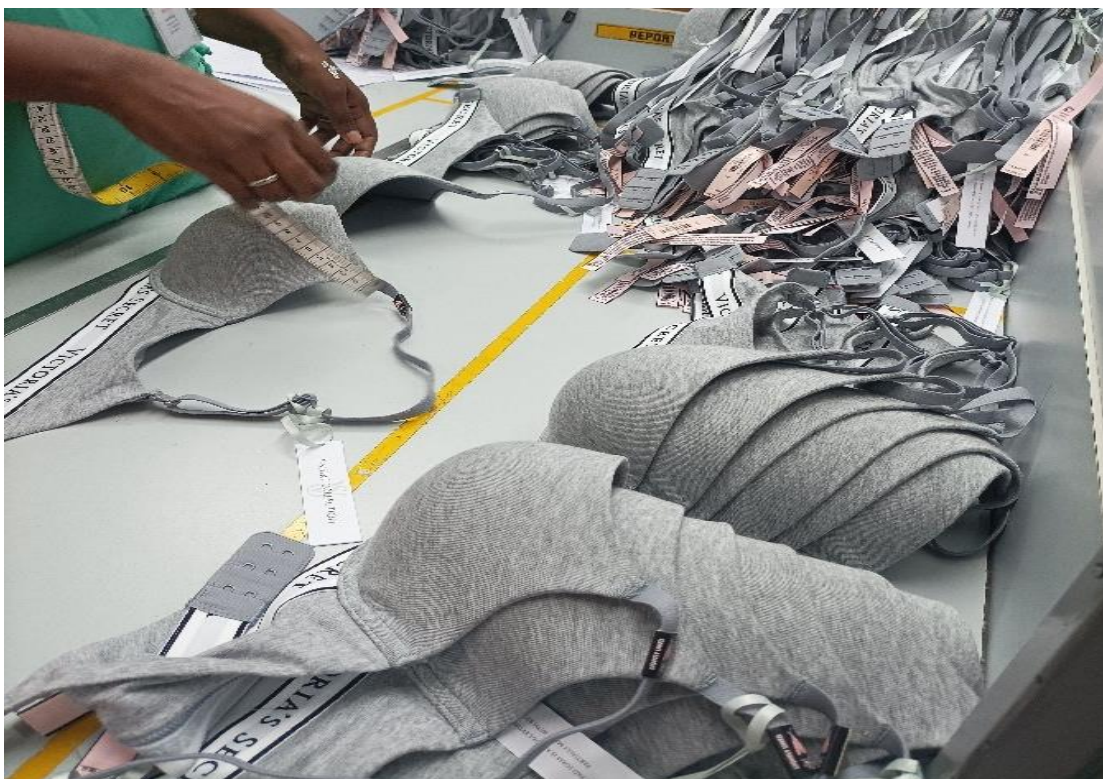


Figure 6.1 (AQL in Line before packing)

There are different stages of inspection are done in garments industry following by inspectors as requirement of consumers:

- Pre-Production Check (PPC)
- Initial Production Check (IPC)
- During Production Check (DUPRO)
- Final Random Inspection (FRI)

Pre-Production Check (PPC)

This is done before production starts. Where then is a final verification of the material used; style, cut and workmanship of the garment or pre-production sample as per the customer requirements.

Initial Production Check (IPC)

This is done at the start of production where a first batch of garments is inspected; to distinguish possible discrepancies/variation and to allow for the necessary corrections to be made bulk production. The inspection is a preliminary stage covering mainly style and general appearance, workmanship, measurements, quality of fabrics, components, weight, color and/or printing.

During Production Check (DuPro)

This is done during production to ensure initial discrepancies/variations have been rectified. This inspection is in fact the follow -up of the initial production check and is generally carried out a few days after the initial inspection, especially if discrepancies have been detected at that time.

Final Random Inspection (FRI)

This is carried out when the production of the total quantity of an order or partial delivery is completed. A sample lot will be selected from the order and a percentage of the garments will be inspected; this percentage usually being stipulated by the buyer. The AQL sampling inspection may be applied or another inspection system designed by the buyer.

PACKING

Garment industry has always been showing the need for different and attractive packaging. The emergence of online shopping has drastically increased the demand of quality packaging in garment sector. We can say with the increase in online shopping the product branding and marketing also has garnered new dimensions. Now a day, the trends in packaging are inclining towards personalized and customized packaging. The report suggests that globally manufacturers are spending a huge amount over \$150 billion on product packaging.

If we look at the retail section of apparels, there the product packaging is as significant as the product itself. That ‘feel good factor’ is always important for attracting new customers as well as ensuring the customer satisfaction. We have many times noticed how the outer look of any product affects the purchasing of a decision of buyers. Safeguarding of a product is the other important factor of a good packaging.



Figure 7; packing

The garment industry is growing exponentially and so is the need of packaging. Here is an example below of **customized garment packaging**.

Different types of packaging involved in garment sector are

The type of packaging mainly depends on the product and its requirement. The packaging is something which works as a coordinated system of preparing goods for transport, warehousing, logistics, sale, and end. Corrugated boxes are used as primary packing as well as secondary packing.

Mono Cartons: One of the packaging styles is mono cartons. Mono cartons are designed and developed in varied styles, patterns and dimensions. Packaging provides a customized solution to best compliment the product.

Litho Laminated Cartons: These cartons possess the higher holding strength as well as cushioning properties. packaging provides 3 ply corrugated inner cartons in multi-coloured printing.

Window Cartons: Window cartons are the best way to attract new and existing customers. Window cartons are printed in extremely stunning and visually attractive display. These are folding cartons either in paper board or litho laminated form with PVC or PET film. They are majorly used for displaying tie, belts, dresses, scarfs, etc.

Some essential packaging functions are following:

- It is a protection to your product
- Storage
- Loading and transport
- Promotional function
- Security
- Information transmission



Figure 7.1(FG Finished)

Types of Packing and Folding

There are four types of packing and folding for shirts, they are mentioned below:

- **Stand up pack**

In which collar is folded and kept at 900 angles with the body.

- **Semi-stand-up pack**

In which collar is folded and kept at 450 angles with the body.

- **Flat pack**

In which collar is folded and completely laid flattened on the body.

- **Hanger pack**

In which shirt is supplied in box by hanging on a hanger.



Figure 7.2:(FG Finished good)



Figure 73:(FG Finished goods)

FG (Finished goods)

Finally dispatch the goods in FG for shipping. Here the good are neatly arranged in box and sealed for shipping.

PROJECT

Day 1 (16/05/22)

The first day of my internship I have join under MOS (MAS operating) department. I went through process flow from fabric spreading to packing.

Fabric spreading (Process of unwinding roll of fabric). They use both automatic & manual machine. Automatic machine can spread fabric 80 to 100 ply. It cuts the fabric with auto cutter. Manual machine can spread fabric 40ply and they use hand write cutting machine.

The process flow:

Spreading → Computer controlled knife cutting → AQL → Bundling → Label
→ Sewing.

Molding process:

Cut fabric → molding → post molding → AQL → Bundling → Label
→ Sewing.

Molding machine requirements

- Top temperature
- Bottom temperature
- Time of sec
- Depth of mold

And the fabric went to sewing process.

Day 2 (17/05/22)

The second day of my internship I come to known about their customer (Buyer)& product list.

Customer of the manufacture (Buyer)

- Decathlon
- Victoria secret
- Jockey
- Victoria sport
- Pink

Product list

- Intimates wear
- Bonded
- Sports wear
- Player
- Outer wear tops
- Outer wear bottoms
- Active wear
- Swim wear
- Thermal wear

In-depth view of the process:

Specific sheet (TECH PACK) before spreading the fabric check specific sheet to known color, fabric.

I went through specific product:

Customer: Decathlon	Size: XL, S, M, L, XXL	Style: 329797
Sew Ord: 8002351339	Color: DA52 (black)	Zone:2
Material ord: 132016	Length:7.07m	Width: 160
Lay from: Face-up-lay	ply: 200lay	

Ply is divided into 3 (80, 40, 40). Because it will be difficult to cut 200 plies at time.

Input: Roll format

Output: lay form

Computer control Kinfe (auto cutter)

First 80 plies moved to the cutting machine. It has 119 patterns of trouser.

Pattern: trouser, pocket, waistband. Same for next 40,40 plies.

AQL & Bundling:

The cut fabric is transferred to AQL test and it is separate according to size, pattern various, right & left of the back & front pattern.

Layer counting according to the layers given in the specific sheet (TECH PACK)

Day 3 (23/05/22)

In the production unit. Before start spreading the roll of fabric have to come from the MQA (Manufacturing Quality Assurance).

Spreading process

Customer: Decathlon Material no: 329797 Width:160 Length:701

Layer: 238 Marker Efficiency: 84.96% Total meter: 1,675

Roll of fabric is spread and send to computerized control cutting machine.

Computerized control cutting machine:

80 plies Total pattern: 119 pieces of pattern: Pocket, Trousers, waist band, label pieces.

It is passed to bundling after cutting pieces comes from auto cutter machine.

Bundling process:

The cut pieces will separate according to size, po no(style), color and more important is specific sheet.

Size: L/S/M.

Labeling process:

Allotted bundle is moved to zone. The pieces are label as 1,2, 3...1000 for each piece.

Sewing process:

From zone it is pass to line.

logo in back part of trouser using auto label machine

time: 12sec

temperature: 155

Front & back right side are attached together.

machine no: 9255

needle: (double) over lock

pocket process:

overlock machine no: 8329

Side pocket is attached to front trouser

machine no: B100MO2682

topstitch machine no:8D0QF04031

Attaching the pocket with waist level of the trouser
machine no: B100M01904

Side seam machine no: B100M00052
Attach from waist to crotch level (center of the trouser)
label(logo) machine no: B100M014

Waist band:
machine no: B100M02814
It will fold the waist band and stitch. Also create a hole for rope machine no:2952 (brother)

Placing the fusing paper in the inside of waist band for the hole.
Fusing time :22sec
Temperature:180

Waist band given a top stitch with multi needle (3) and with elastic band
Last process of sewing bar tag machine no: 10250
After sewing it goes to AQL& packing.

Day 4 (23/05/22)

Spreading process

Customer: Decathlon Material no: 2427/14709 Width:177 Length:6.190

Layer: 80 Marker Efficiency: 86.96% Total meter: 1,675

Roll of fabric is spread and send to computerized control cutting machine.

Computerized control cutting machine:

80 plies Total pattern: 119 pieces of pattern: Pocket, Trousers, waist band, label pieces.

It is passed to bundling after cutting pieces comes from auto cutter machine.

Bundling process:

The cut pieces will separate according to size, po no(style), color and more important is specific sheet.
Size: L/S/M.

Labeling process:

Allotted bundle is moved to zone. The pieces are label as 1,2, 3...1000 for each piece.

Sewing process:

From zone it is pass to line.

logo in back part of trouser using auto label machine

time: 12sec

temperature: 155

Front & back right side are attached together.

machine no: 9255

needle: (double) over lock

pocket process:

overlock machine no: 8329

Side pocket is attached to front trouser

machine no: B100MO2682

topstitch machine no:8D0QF04031

Attaching the pocket with waist level of the trouser

machine no: B100M01904

Side seam machine no: B100M00052

Attach from waist to crotch level (center of the trouser)

label(logo) machine no: B100M014

Waist band:

machine no: B100M02814

It will fold the waist band and stitch. Also create a hole for rope machine no:2952 (brother)

Placing the fusing paper in the inside of waist band for the hole.

Fusing time :22sec

Temperature:180

Waist band given a top stitch with multi needle (3) and with elastic band

Last process of sewing bar tag machine no: 10250

After sewing it goes to AQL& packing.

Day 5 (24/05/22)

Spreading process

Customer: Decathlon Sew order: 60408 Material no:2427/14709 Color: DA80

Width: 177 Length: 6.190 Lay: 80 Size: 8-9yrs, 7-8yrs, 5-6yrs, 14-15yrs, 10-11yrs.

Roll of fabric is spread and moved to the auto cutter.

Computerized control cutting machine:

80 plies Total pattern: 119 pieces of pattern: Pocket, Trousers, waist band, label pieces.

It is passed to bundling after cutting pieces comes from auto cutter machine.

Bundling process:

The cut pieces will separate according to size, po no(style), color and more important is specific sheet.

Size: 8-9yrs, 7-8yrs, 5-6yrs, 14-15yrs, 10-11yrs.

Labeling process:

Allotted bundle is moved to zone. The pieces are label as 1,2, 3...1,200 for each piece.

Sewing process:

From zone it is pass to line.

logo in back part of trouser using auto label machine

time: 12sec

temperature: 155

Front & back right side are attached together.

machine no: 9255

needle: (double) over lock

pocket process:

overlock machine no: 8329

Side pocket is attached to front trouser

machine no: B100MO2682

topstitch machine no:8D0QF04031

Attaching the pocket with waist level of the trouser

machine no: B100M01904

Side seam machine no: B100M00052

Attach from waist to crotch level (center of the trouser)

label(logo) machine no: B100M014

Waist band:

machine no: B100M02814

It will fold the waist band and stitch. Also create a hole for rope machine no:2952 (brother)

Placing the fusing paper in the inside of waist band for the hole.

Fusing time :22sec

Temperature:180

Waist band given a top stitch with multi needle (3) and with elastic band

Last process of sewing bar tag machine no: 10250

After sewing it goes to AQL& packing.

Spreading process

Customer: VSL Material no: 8375 Length: 5.590 width:140

Size: DDD(F), DD(E), B, C plies:32 sew order no: 4715

Eg: (36DDD, 34DD, 38C, 32B) Zone 3

Roll of fabric is spread and moved to the auto cutter.

Computerized control cutting machine

Total pieces:256

Side part of right& left (wing), cup(coverage)

Bundling

The pieces are separated according to the size that given in specific sheet

Size: 36B, 34B, 34A, 32B, 32C.

Qty: 39, 941, 392, 235, 110.

Ply-40

Day 6 (25/05/22)

Post molding

Customer: Pink Line no:1 Style:710 Po number: 2334618 Size: 38C, 36D
Qty: 39, 235.

Line no:3 style: 710 Po number: 2334712 Size: 36B, 34C, 34D
Qty: 229, 353, 274

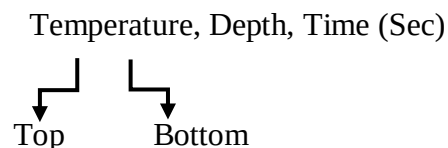
Line no:10 style: 269 Po number: 2361643 Size: 4B, 4C, 34A, 2A
Qty: 78, 156, 156, 156

The process is done after molding. Cutting the edge of the cup fabric which has come from molded. After post molding the piece are taken to the line and sew.

Sewing Process:

After molding  Post molding

Molding – The temperature is given according to the fabric. The depth is according to the size of garment.



Frist attach the pu-cup with front piece (mold)and attach the strap.

Trim the edge and join the bottom hem. Attach the center part and wings and given top stitch.

Bar tag and AQL checking

AQL Process:

- Elastic of the fabric should be proper.
- The inner stitch should not be seen in sides (wing)
- Stitches should be properly.

Final process is packing. It is done by separating the size.

Customer: Decathlon Material no: 2427/14709 Width:177 Length:6.190

Layer: 80 Marker Efficiency: 86.96% Total meter: 1,675

logo in back part of trouser using auto label machine

time: 12sec

temperature: 155

Front & back right side are attached together.

machine no: 9255

needle: (double) over lock

pocket process:

overlock machine no: 8329

Side pocket is attached to front trouser

machine no: B100MO2682

topstitch machine no:8D0QF04031

Attaching the pocket with waist level of the trouser

machine no: B100M01904

Side seam machine no: B100M00052

Attach from waist to crotch level (center of the trouser)

label(logo) machine no: B100M014

Waist band:

machine no: B100M02814

It will fold the waist band and stitch. Also create a hole for rope machine no:2952 (brother)

Placing the fusing paper in the inside of waist band for the hole.

Fusing time :22sec

Temperature:180

Waist band given a top stitch with multi needle (3) and with elastic band

Last process of sewing bar tag machine no: 10250

After sewing it goes to AQL& packing.

Customer: Decathlon Style:33508 Size XL, XS, XXL, S, M

Neck placket interlining (fusible) with hand iron and marking on it by chalk as per size. Plackets (both left and right) joining with the front part as per exact position by a plain sewing machine.

Placket top stitching by flat lock sewing machine. Scissoring of front part exactly at the middle keeping the two plackets in two sides.

Scissoring of front part exactly at the middle keeping the two plackets in two sides.

Nose tagging by plain sewing machine. Neck joining by overlock sewing machine. Neck top stitching by flat lock sewing machine.

Placket top stitching by flat lock sewing machine. Button and box plate tagging by plain sewing machine. Placket box top stitching by plain sewing machine.

Neck piping by plain sewing machine. Piping top stitching by flat lock sewing machine. Sleeve matching as per exact size and number. Sleeve joining (Left and Right) with the body by overlock sewing machine.

Armhole top stitching by flat lock sewing machine. Sleeve tagging by plain sewing machine so as to facilitate easy positioning while side seaming. Side seaming with the label by overlock sewing machine.

Length measuring as per demand and scissoring if necessary. Bottom hemming by flatlock (Zigzag stitch) sewing machine. Inspection and send it for ironing.

AQL and Packing.

Customer: Victoria Secrete Style: 10224806 Size: 34B, 32C, 38E

Attach the pucup with front piece (mold) and attach the strap. Trim the edge and join the bottom hem. Attach the center part and wings and given top stitch. Bar tag and AQL checking.

How can improve design (Decathlon)

Style no :508(polo T- shirt)

- Side slit can be improved
- Reduce the bar tag width
- Label stitch are loped
- Collar stitches are not even

Style no: 285(Quechua)

- Sleeve can have top stitch
- Collar seam stitch should be hide and top stitch
- Raw edge should be avoided while attaching the two different pieces

Style no :602(Domyos)

- Sleeve and side seam raw edge can be avoided

Style no: 307083(Artegon)

- Round neck will suitable for this style
- Bottom hem and sleeve can double folded, given over lock stitch
- Stitch is looped

Day 8(27/05/22)

Process Mapping

The Flow chat start from techpack to storage area,

- Techpack received from the customer
- Importing the pattern
- Validating the pattern
- Following the TRG sample
- Pattern are modified
- The patterns are finalized
- Grading the pattern
- The model created
- Order is created
- Checking the graded pattern
- Po sheet is created
- Quantity of the po sheet is calculated

- Width information are received
- Select accumark
- Marker process lay the in system
- After marker is completed its verified
- Marking entry in SAP
- Creating virtual docket
- Maker is releasing consumption to MQA
- Sending the marker and its plotted
- Cut the extra sheet and edge
- Po sheet are printed
- Taking the marker for check
- Drawing the pattern
- Checking the length & width
- Rolling the marker
- Placing in the storage area

The second flow chat start from roll to placing the marker paper on plies

- Roll are transferred from MQA
- Roll are stored in bulk
- Roll cover are removed
- Using fabric roll tube are unloaded
- Operator set the machine (Face to Face /Face down /Face up)
- Pull fabric in
- Edge of fabric cut
- Set length & width
- Set no of plies
- Spreading starts after single lay using scale check the length & width
- Count the no of plies after finishing the ply
- Marker paper are placed above the plies
- It is moved forward to the auto cutter

Process Mapping

The third flow chat start from placing plies in the auto cutter to bundling

- The plies passed from spreading table
- Check the po number in the marker which is same in the specific sheet
- Length & width are checked
- Checking no of pattern
- Press air & Conveyer
- Align the layer of fabric in the cutting machine
- Switch off the air & Conveyer
- Make sure the marker is placed correctly
- Poly paper are use to cover the marker
- Vacuum on
- The laser should be in position
- Cutter scans the marker edge
- Pattern are divided into 4 parts
- Press start
- Cutting start for the 1st part
- Collector will collect the pieces
- The piece is bundled
- It is move to bundling table

Day 10(30/05/22) & (31/06/22)

Cycle Time (SSV/SMV)

Activities	cycle 1(min)	cycle 2 (min)
Removing the roll cover	0.67	0.78
Place the roll in the machine	0.87	0.97
Setting the machine (computer)	0.1	0.09
Pull the fabric in	0.18	0.13
Edge cutting	0.03	0.03
Spreading time (1 lay)	0.19	0.16
Set length & width	0.46	0.37
Spreading	8.09	6.9
Counting no of plies	0.97	0.84
Placing the marker above the plies	0.16	0.19
Moving the plies to cutting	0.45	0.38

Table 1.1(cycle time for spreading)

Cycle Time (SSV/SMV)

Activities	cycle 1(min)	cycle 2 (min)
Removing the roll cover	0.91	0.98
Place the roll in the machine	0.79	0.81
Ssetting the machine (computer)	0.09	0.12
Pull the fabric in	0.17	0.14
Edge cutting	0.03	0.03
Spreading time (1 lay)	0.18	0.15
Set length & width	0.36	0.45
Spreading	7.08	9.2
Counting no of plies	0.95	0.62
Placing the marker above the plies	0.16	0.15
Moving the plies to cutting	0.57	0.47

Table 1.2 (cycle time for spreading)

Day 12(1/05/22) & (2/06/22)

Po no:	Activities	Plies	Pieces	Marker	Time (min)
2351646	Spreading	67	1,200	M1	35.21
	cutting				31.51
	AQL				0.71
	Bundling				18.31
2351646	Spreading	53	600	M2	43.81
	cutting				35.71
	AQL				0.99
	Bundling				20.31
2351648	Spreading	100	600	M2	45.74
	cutting				36.53
	AQL				10.02
	Bundling				73.31
2351647	Spreading	100	600	M2	31.63
	cutting				30.03
	AQL				2.1
	Bundling				15.99
2351650	Spreading	94	1200	M2	43.15
	cutting				25.98
	AQL				0.56
	Bundling				17.68

Table 1.3 (cycle time for spreading, cutting, AQL, bundling)

Day 14(3/05/22) & (4/06/22)

Po no:	Activities	Plies	Pieces	Marker	Time (min)
2351650	Spreading	65	600	M1	39.68
	cutting				31.53
	AQL				0.67
	Bundling				12.99
2307968	Spreading	34	374	M2	30.11
	cutting				45.86
	AQL				0.43
	Bundling				19.54
2392847	Spreading	72	503	M4	31.22
	cutting				39.2
	AQL				0.73
	Bundling				14.56
2383571	Spreading	76	912	M1	52.13
	cutting				20.18
	AQL				2.98
	Bundling				20.21
2351650	Spreading	60	600	M3	48.23
	cutting				31.03
	AQL				10.09
	Bundling				16.27

Table 1.4 (cycle time for spreading, cutting, AQL, bundling)

Day 16(6/06/22) & (7/06/22)**(Spreading) Cycle Time**

Sew order		Po		Activity (Spreading)	Total timing
Number	Plies(layer)	Number	Pieces		(min)
2407194	95	1	600	Form roll placed to edge cutting From length& width checking to spreading From counting plies to marker spreading Moving the plies to the auto cutting table	20.02 min
2407393	35	1	210	Form roll placed to edge cutting From length& width checking to spreading From counting plies to marker spreading	17.83 min
2407393	55	1	330	Form roll placed to edge cutting From length& width checking to spreading From counting plies to marker spreading	40.83 min
2394961	60	1	900	Form roll placed to edge cutting From length& width checking to spreading From counting plies to marker spreading	52.5 min
2386241	39	1	1551	Form roll placed to edge cutting From length& width checking to spreading From counting plies to marker spreading	23.7min

*Table 1.5 (Spreading) Cycle Time***Day 18(8/06/22) & (9/06/22)****(Cutting) Cycle Time**

Sew order		Po		Activity (Cutting)	Total timing
Number	Plies(layer)	Number	Pieces		(min)
2407194	95	1	600	From plies transferred to bundling the pieces	40.33 min
2407393	55	1	330	From plies transferred to bundling the pieces	30.6 min
2386241	20	1	2082	From plies transferred to bundling the pieces	22.35 min
2394961	60	1	900	From plies transferred to bundling the pieces	34.11

Table 1.6 (Cutting) Cycle Time

Day 20 (10/06/22)**(bundling) Cycle Time**

Sew order		Po		Activity (Bundling)	Total timing
Number	Plies(layer)	Number	Pieces		(min)
2386241	20	1	2082	The pieces are bundled	18.18min
2394961	60	1	900	The pieces are bundled	34.2 min
2407385	65	1	750	The pieces are bundled	45.03 min
2407385	55	1	810	The pieces are bundled	29.7 min

*Table 1.7(bundling) Cycle Time***Day 21 (11/06/22) & (12/06/22)****(AQL) Cycle Time**

Sew order		Po		Activity (AQL)	Time	Total timing
Number	Plies(layer)	Number	Pieces			(1 Pieces)
2407395	65	1	455	Single bundle is taken for AQL	51.1	0.11 min
2408206	58	1	140	Singlebundle is taken for AQL	1.04	0.07 min
2408206	58	1	140	Single bundle is taken for AQL	56.26	0.04 min
2418177	80	1	600	Single bundle is taken for AQL	01:09.8	0.0019 min
222767	56	1	400	Single bundle is taken for AQL	01:10.2	0.002 min

Table 1.8 (AQL) Cycle Time

Day 23 (13/06/22) & (14/06/22)

(Labelling) Cycle Time

Sew order Number	Plies	Style	Size	Activity (Labelling)	Pattern	Total timing (1 Pieces)
2227669	94	119	XL	Pieces are moved to Zone and it is numbered	sleeve R&L Bot side Front Back	1.86 min
2227669	94	119	XL	Pieces are moved to Zone and it is numbered	Under sleeve Shoulder Collar	6.58 min
2407392	22	797	L	Pieces are moved to Zone and it is numbered	pocket	3.3 min
2407392	22	797	L	Pieces are moved to Zone and it is numbered	Back	1.16 min
2407392	22	797	L	Pieces are moved to Zone and it is numbered	Front	1.1 min
2407392	22	797	L	Pieces are moved to Zone and it is numbered	Belt	0.38 min
24080205	42	702	10-11yrs	Pieces are moved to Zone and it is numbered	9 Pattern	5.7 min
2392848	51	417	42	Pieces are moved to Zone and it is numbered	10 Pattern	7.7 min

Table 1.9(Labelling) Cycle Time

Day 25 (15/06/22) & (16/06/22)

(Line AQL) Cycle Time

Sty No	PCS Check	Size	Product	PCS	Act(Sew AQL)	Line No	1(min)	2(min)	3(min)	4(min)	5(min)	6(min)	7(min)	8(min)	9(min)	10(min)	Total(min)
417	14	52	Trouser	40	The garments are checked by AQL operator	36m2	1.65	1.88	1.46	60.2	1.51	1.58	1.18	1.68	1	1.41	73.55
797	10	S	Trouser	40		33m1	2.66	2.45	2.85	2.7	2.23	1.41	1.38	2.11	1.93	2.71	22.43
602	20	S	T- shirt	40		17m1	0.85	0.66	0.78	0.5	0.86	0.8	0.83	0.33	0.38	2.48	8.47
720	10	7-8 yrs	T- shirt	40		36m1	0.73	0.68	0.88	0.66	0.68	0.5	0.81	0.7	0.75	0.98	7.37
119	20	L	T- shirt	40		37	0.5	1.38	0.68	0.68	0.8	0.8	0.75	0.81	0.58	0.65	7.63
																	23.89

Table 1.10(Line AQL) Cycle Time

Day 27(17/06/22) & (18/06/22)

(Packing) Cycle Time

Sty No	PCS Pack	Size	Pieces	Act (Packing)	Line No	1(min)	2(min)	3(min)	4(min)	5(min)	6(min)	7(min)	8(min)	9(min)	10(min)	Total(mi n)
861	24	8-9 yrs	84	The end product folded and neatly packed in the section	16m1	0.23	0.28	0.31	0.28	0.15	0.2	0.23	0.2	0.2	0.18	2.26
8009	20	L	40		17 m2	0.33	0.36	0.35	0.31	0.4	0.38	0.38	0.4	0.31	0.41	3.63
602	20	S	20		17m1	0.4	0.68	0.38	0.38	3.19	0.5	0.35	0.48	1.8	0.68	8.84
191	20	M	22		7m2	0.26	0.23	0.21	0.31	0.26	0.28	0.33	0.18	0.25	0.26	2.57
174	19	42	20		36m2	0.21	0.21	0.2	0.41	0.45	0.38	0.36	0.36	0.46	0.43	3.47
																4.154

Table 1.20(Packing) Cycle Time

Day 29(20/06/22) & (21/06/22)

(Line AQL) Cycle Time only for T-shirt

Sty No	PCS Check	Size	Product	PCS	Act(Sew AQL)	Line No	1(min)	2(min)	3(min)	4(min)	5(min)	Total(min)
720	10	12-13 yrs	T- shirt	40	The garments are checked by AQL operator	36m1	0.65	0.71	0.61	0.43	0.6	2.35
519	9	XXL	T- shirt	40		36m2	1.6	1.03	1.2	1.3	1.6	6.73
119	5	XL	T- shirt	40		37	1.7	1.1	1	1.4	1.1	6.3
												5.127

Table 1.21 (Line AQL) Cycle Time only for T-shirt

Day 31(22/06/22) & (23/06/22)

(Packing) Cycle Time

Sty No	PCS Check	Size	Product	PCS	Act (Packing)	Line No	1(min)	2(min)	3(min)	4(min)	5(min)	Total(min)
119	10	XL	T- shirt	40	The end product folded and neatly packed in the section	7m2	0.23	0.21	0.13	0.25	0.2	1.02
519	10	XXL	T- shirt	40		36m2	0.21	0.31	0.23	0.26	0.3	1.31
861	10	XL	T- shirt	40		16m1	0.2	0.18	0.15	0.18	0.2	0.91
												1.08

Table 1.22(Packing) Cycle Time

Day 32(24/06/22) & (25/06/22)

	SNO:	LINENO:	OPERATION	NAME	STYLE NO:	PCS 1	PCS 2	PCS 3	PCS 4	PCS 5	AVG. CYLCE TIME	ALWNC(15%)	CYCLE TIME	STYLE SMV	STYLE SSV	OPERATOR SMV	OPERATOR SSV
ZONE 2	1	16m1	Packing	Nithiya	202	12	24	20	16	13	17	2.55	19.55	10.35	621	0.5	30
	2	7m2		Karthik	119	8	6	8	8	13	8.6	1.29	9.89	10.75	645	1.01	60.6
	3	7m1		Abinaya	602	13	12	15	11	14	13	1.95	14.95	9.3	558	0.7	42
	4	11m3		Barkath	797	34	22	25	23	24	25.6	3.84	29.44	10.68	640.8	0.74	44.4

	SNO:	LINENO:	OPERATION	NAME	STYLE NO:	PCS 1	PCS 2	PCS 3	PCS 4	PCS 5	AVG. CYLCE TIME	ALWNC(15%)	CYCLE TIME	STYLE SMV	STYLE SSV	OPERATOR SMV	OPERATOR SSV
ZONE 1	1	17m1	Packing	Lavanya	215	29	21	23	22	20	23	3.45	26.45	9.3	558	0.7	42
	2	17m2		Dhanesh	602	19	19	19	16	20	18.6	2.79	21.39	10.98	658.8	0.53	31.8

Table 1.23 zone packing

Day 34(28/06/22) & (30/06/22)

	SNO:	LINENO:	OPERATION	NAME	STYLE NO:	PCS 1	PCS 2	PCS 3	PCS 4	PCS 5	AVG. CYLCE TIME	ALWNC(15%)	CYCLE TIME	STYLE SMV	STYLE SSV	OPERATOR SMV	OPERATOR SSV
ZONE 3	1	33m1	Packing	Tamilselvi	797	30	31	25	28	31	29	4.35	33.35	12.6	756	0.74	44.4
	2	36m1		Rajasekar	334	19	16	19	21	20	19	2.85	21.85	8.16	489.6	0.7	42
	3	36m2		Ramesh	519	14	16	16	16	17	15.8	2.37	18.17	13.95	837	0.7	42
	4	37		Vanmathi	119	21	23	22	22	22	22	3.3	25.3	10.72	643.2	0.7	42
	5	31		Sambath	797	25	24	27	25	27	25.6	3.84	29.44	10.68	640.8	0.8	48
	6	39		Tamizharasi	835	32	36	31	30	24	30.6	4.59	35.19	5.72	343.2	0.8	48

Table 1.24 zone packing

CONCLUSION

This internship taught about the manufacturing processes used in the fashion industry, which is at the cutting edge of design, innovation, and large-scale production. This program helped to gain knowledge about the active wear industry's raw material sourcing, production, quality control, and final product. It offered knowledge on premium clothing of the finest quality in the global market for sports wears. The internship program has shed light on the establishment of internal control procedures and organizational abilities that are pertinent to the apparel industry. Additionally, learnt on the workplace ethics and helped in individuality development. Overall, this internship program gave a lot of knowledge about the structure of the fashion industry, how it operates in accordance with moral principles, and how it contributes to the world.

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