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Education for All

Dr. Babasaheb Ambedkar
Open University
(Established by Government of Gujarat)

DIPLOMA IN FASHION DESIGNING

TEXTILE & APPAREL QUALITY ASSURANCE & MANAGMENT

DFD-10

Message for the Students

Dr. Babasaheb Ambedkar Open (University is the only state Open University, established by the Government of Gujarat by the Act No. 14 of 1994 passed by the Gujarat State Legislature; in the memory of the creator of Indian Constitution and Bharat Ratna Dr. Babasaheb Ambedkar. We Stand at the seventh position in terms of establishment of the Open Universities in the country. The University provides as many as 54 courses including various Certificate, Diploma, UG, PG as well as Doctoral to strengthen Higher Education across the state.

On the occasion of the birth anniversary of Babasaheb Ambedkar, the Gujarat government secured a quiet place with the latest convenience for University, and created a building with all the modern amenities named 'Jyotirmay' Parisar. The Board of Management of the University has greatly contributed to the making of the University and will continue to this by all the means.

Education is the perceived capital investment. Education can contribute more to improving the quality of the people. Here I remember the educational philosophy laid down by Shri Swami Vivekananda:

> ***"We want the education by which the character is formed, strength of mind is Increased, the intellect is expand and by which one can stand on one's own feet".***

In order to provide students with qualitative, skill and life oriented education at their threshold. Dr. Babaasaheb Ambedkar Open University is dedicated to this very manifestation of education. The university is incessantly working to provide higher education to the wider mass across the state of Gujarat and prepare them to face day to day challenges and lead their lives with all the capacity for the upliftment of the society in general and the nation in particular.

The university following the core motto 'स्वाध्याय: परमम् तप:' does believe in offering enriched curriculum to the student. The university has come up with lucid material for the better understanding of the students in their concerned subject. With this, the university has widened scope for those students who are not able to continue with their education in regular/conventional mode. In every subject a dedicated term for Self Learning Material comprising of Programme advisory committee members, content writers and content and language reviewers has been formed to cater the needs of the students.

Matching with the pace of the digital world, the university has its own digital platform Omkar-e to provide education through ICT. Very soon, the University going to offer new online Certificate and Diploma programme on various subjects like Yoga, Naturopathy, and Indian Classical Dance etc. would be available as elective also.

With all these efforts, Dr. Babasaheb Ambedkar Open University is in the process of being core centre of Knowledge and Education and we invite you to join hands to this pious *Yajna* and bring the dreams of Dr. Babasaheb Ambedkar of Harmonious Society come true.

Prof. Ami Upadhyay
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Dr. BabsahebAmbedkar Open University

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FASHION DESIGN – DIPLOMA COURSE
DFD: 10

TEXTILE AND APPAREL QUALITY ASSURANCE AND MANAGEMENT

UNIT : 1 INTRODUCTION & CONCEPT OF AQL

: STRUCTURE:

1.0 OBJECTIVE

After studying this unit students,

- Will have knowledge about Acceptable quality level (AQL).
- Learn about how to work AQL and know the defects in AQL.
- Basic idea about AQL tables.

1.1 INTRODUCTION

In the fashion industry, AQL is one of the most frequently used terms, specifically within the apparel export business. It is referred to as the 'Acceptable Quality Level' and is outlined to identify the proportion of defective items that is tolerated /accepted by the customer from the manufacturer. In alternative words, it is the quality level that is least tolerable.

An acceptable quality level could be a test and /or scrutiny standard that prescribes the vary of the quantity of defective parts that is thought of acceptable after sampling those parts during a scrutiny.

The acceptable quality level (AQL) can be a measure applied to products and defined in ISO 2859-1 because the "quality level that is the worst tolerable." The AQL tells you the way several defective components are thought of acceptable during random sampling quality inspections. It is typically expressed as a percentage or ratio of the number of defects compared to the total quantity.

AQL is one of the most regularly utilized terms with regards to quality in the apparel export industry. As the majority of the acceptance decisions of the attire shipments for the export market are made on the idea of AQL basically based sampling plans AQL recommends that Acceptable Quality Level. In any business method, before accepting the completed items from the manufacturer, the client does an assessment of products. It is most necessary in export garment sector because foreign customers are most concerned regarding product quality.

They give AQL on the item to the manufacturer. Purchasers do assessment of item by random process method. If item meets the AQL means it is acceptable quality level and then he gives authentication to transport the items. The AQL level varies method to method, product to product and even customer to customer.

1.2 ACCEPTABLE QUALITY LEVEL IN THE APPAREL INDUSTRY

Acceptable quality level can be classified into three different standards, namely critical, major and minor slight defects and are used by imports to set the most extreme number of defective units, beyond which a batch will be rejected. For example, shippers will satiate 'I need close to 2.5% damaged things altogether of the whole over amount, on normal more than a few creation runs with the provider. Acceptable quality level tool is typically utilized during the final reviews when the products are ready to be delivered out and are done on a sampling basis. It is crucial to understand that the acceptable quality level should not be utilized as a measure for preventing quality issues of defects. Relaying on definite inspection to identify any defective items or quality issues will result about major delays in production and will be a waste of time and money. It is almost impossible to eliminate defecate items completely. They occur in basically every batch and can occur even after manufactures have checked individual items since visual examinations aren't 100% full verification. In this manner, it's important to guarantee that your raw materials are up to the standard and quality, of the type of quality products you expect to produce. If your raw materials are substandard to being with, you will risk experiencing significant quality issues during the

last phases of production. Having control over the quality of your raw materials will decrease quality risks by up to 70%!

1.3 HOW ACCEPTABLE QUALITY LEVEL (AQL) WORKS

Products in a sample are tested at randomly, and if the number of defective piece is below the preset amount, that product is alleged to fulfill the suitable quality level (AQL). If the acceptable quality level (AQL) is not reached for a specific sampling of products, manufacturers can review the different parameters in the production method to determine the areas causing the defects.

The AQL of a product will vary from business to industry; medical products, as an example, have stringent AQLs because defective products are a health risk.

As an example, consider an AQL of 1% on a production run. This percentage means that no more than 1% of the batch can be defective. If a production run is composed of 1,000 products, only 10 products can be defective. If 11 products are defective, the entire batch is scrapped. This figure of 11 or more defective products is known as the rejectable quality level (RQL).

The AQL is an important statistic for companies seeking a Six Sigma level of control that could be a quality-control methodology developed in 1986 by Motorola, Inc. AQL is additionally referred to as the acceptable quality limit.

1.4 SPECIAL CONSIDERATION

Customers would, of course, prefer zero-defect products or services; the ideal acceptable quality level. However, sellers and customers usually try to arrive and set acceptable quality limits based on factors typically related to business, financial, and safety concerns.

1.4.1 AQL Defects

The faults or **defects** which are found during random sampling or inspections are classified into four categories:

1. Critical defects: Defects, when accepted could harm users. Such defects are unacceptable. Critical defects are defined as 0% AQL.
2. Major defect: Defects usually not acceptable by the end-users, as they are likely to result in failure. The AQL for major defects is 2.5%.
3. Minor defect: Defects not likely to reduce materially the usability of the product for its intended purpose but that differ from specified standards; some end users will still buy such products. The AQL for minor defects is 4%.

4. Slight defects: Normally 6.5% (defect is only recognizable internally)

Furthermore, the garment industry identifies six types of acceptable quality level standards:

1. Acceptable Quality Level 1%
2. Acceptable Quality Level 1.5%
3. Acceptable Quality Level 2.5%
4. Acceptable Quality Level 4%
5. Acceptable Quality Level 6.5%
6. Acceptable Quality Level 10%

1.4.2 AQL in Practice

Acceptable quality level (AQL): AQL is normally viewed as the most noticeably worst quality level that is as yet thought to be satisfactory. It is the most extreme percent defective that can be considered satisfactory. The probability of accepting an AQL lot should be high. A Probability of 0.95 translates to a risk of 0.05.

Rejectable quality level (RQL): This is considered an unacceptable quality level and is sometimes known as lot tolerance percent defective (LTPD). The consumer's risk has been standardized in some tables as 0.1. The probability of accepting a RQL lot is low.

Indifference quality level (IQL): This quality level is somewhere close to AQL and RQL. Various organizations keep up various interpretations of each defect type. However, buyers agree on an AQL standard that is appropriate to the level of risk each party assumes. These standards are utilized as a source of during a pre-shipment inspection.

1.5 ACCEPTABLE QUALITY LEVEL (AQL) TABLES FOR GARMENT INDUSTRY

Before using the AQL tables, you should decide on three parameters:

The 'lot size' - If you ordered different products, the quantity of each item is a lot size, and separate examinations ought to be carried out for each lot. If you ordered only single item, the lot size is your complete order quantity.

The inspection level - Different inspection levels will command different number of samples to examination. In this article, we will stick to the so called “level II", under "normal severity".

The AQL level - appropriate for your market. If your clients accept very few defects, you should want set a lower AQL for both major and minor defects.

There are basically two tables. The first reveals to you which 'code letter' to use. Then, the code letter will give you the sample size and the maximum numbers of defects that can be accepted.

First table: sample size code letters

Lot size (Number of ordered products)			**General inspection levels**		
			I	**II**	**III**
2	to	8	A	A	B
9	to	15	A	B	C
16	to	25	B	C	D
26	to	50	C	D	E
51	to	90	C	E	F
91	to	150	D	F	G
151	to	280	E	G	H
281	to	500	F	H	J
501	to	1200	G	J	K
1,201	to	3200	H	K	L
3,201	to	10,000	J	L	M
10,001	to	35,000	K	M	N
35,001	to	150,000	L	N	P
150,001	to	500,000	M	P	Q
500,001	And over		N	Q	R

How to read AQL table?

If you follow my example, I assume your ‘lot size’ is comprised between 3,201 pieces and 10,000 pieces, and that your inspection level is ‘II’. Consequently, the code letter is “L”.

Second table: Sampling plan for shipment inspection

Lot or batch size	**Sample size code letter**	**Sample size**	**Acceptable Quality level**					
			2.5		**4.0**		**6.5**	
			Ac	**Re**	**Ac**	**Re**	**Ac**	**Re**
2 – 8	A	2	0	1	0	1	0	1
9 – 15	B	3	0	1	0	1	0	1
15 – 25	C	5	0	1	0	1	0	1
26 – 50	D	8	0	1	1	2	1	2
51 – 90	E	13	1	2	1	2	2	3
91 – 150	F	20	1	2	2	3	3	4
151 - 280	G	32	2	3	3	4	5	6
251 - 500	H	50	3	4	5	6	7	8
501 - 1200	J	80	5	6	7	8	10	11
1201 -	K	125	7	8	10	11	14	15

Lot or batch size	Sample size code letter	Sample size	Acceptable Quality level					
			2.5		4.0		6.5	
			Ac	Re	Ac	Re	Ac	Re
3200								
3201 - 10000	L	200	10	11	14	15	21	22
10001 - 3500	M	315	14	15	21	22	21	22

How to read AQL table?

It is very easy process
Lot or batch size: it means total how many pieces inspector is going to check.
Sample size code letter: This code is indicative of a range of batch size.
Sample Size: how many pieces will be picked up for inspection from the total offered pieces.
Ac (Accepted): If the inspector finds up to that many defective pieces the shipment will be accepted by buyer.

Re (Rejected): on the other hand number in this column denotes that if the inspector finds that much defective pieces or more than the listed number, the shipment will be rejected (or asked to the manufacturer for 100% inspection and re-offer for final inspection) by buyer.

1.5.1 AQL Requirements Based on the products

Overall cases the purchaser will figure out which testing plan and what AQL to adopt. There are three kinds of inspecting plans: for example single, double and multiple sampling plans. Each testing plan can be performed at three levels, for example normal, tightened and reduced, contingent upon inspection requirements and quality of the items. The textile business for the most part utilizes single sampling plans for the acceptance decisions. In any case, a purchaser additionally utilizes double sampling process. In single example dependent on AQL table you randomly draw an example comprising of determined number of garments from a lot. The sample plan likewise gives the number of greatest permitted damaged pieces. If the defective pieces are not exactly a permitted number the lot is accepted and if the quantity of damaged pieces is more than allowed the lot is rejected. One may say that as the acceptance examining is scientific, ideally talking, it should lead 100 % reliable result. In other words, it should consistently lead to acceptance of lots containing lower faulty level than AQL and should dismiss every one of the parts that contain more defective items than AQL. But this is not possible, as the acceptance decision is made only on the base of fewer samples drawn from the lot and it carries a danger of making a wrong judgment.

Single sampling plan - Normal inspection:

Assurance an AQL of 2.5 % and a lot size of 1200 pieces and the sample size is 80 pieces. If the number of defective garments found is 5 the total lot is "Acceptable" suppose if the damaged pieces found is 6, the total pieces is "Reject/Re-Check".

Double sampling plan - Normal Inspection:

Assurance an AQL 4.0% and a lot size is 1200 pieces and the sample size is 80 pieces. If the Number of defective garments found is 7, the total lot is "Acceptable" suppose if the damaged pieces found is 8 the total pieces is "Reject/ Re-Check".

For Example:

- Total garments (lot Size) 1200 garments
- Sample size (selected for inspection) 80 garments
- AQL 2.5 / 4.0
- If the major defective found is 5 and minor defective found is 7 the total garments is "Acceptable".
- If the defective exceed (Above 5 major and 7 Minor), the total garments is Reject / Re-check.

1.5.2 What AQL is not?

Having known what is AQL? How does it work? How to succeed in AQL based inspections? It is equally important to know, as indicated below, what AQL is not:

A permit to ship defective products to the tune of agreed AQL level: AQL 4.0 doesn't mean that provider has a privilege to send up to 4% defective product to client / purchaser.

A ensure that all shipments passed according to AQL plan will definitely contain lower percent defective than the specified AQL. There is additionally no assurance that lots with higher percentage defective will not pass on AQL inspection.

An indicator of the quality level accomplished by a producer. Let us to assume that the normal rate of defective garment in a manufacturer's shipment is 6%, however the AQL utilized by purchaser for final assessment is 2.5. It is conceivable that the producer may depend on 100% assessment of the product to remove the faulty garment so the shipment can pass the last inspection by the purchaser at AQL 2.5

Check Your Progress

1) What is AQL?

_____

_____

_____

_____

2) Role of acceptable quality level (AQL) in apparel industry

3) Explain about AQL defects.

4) How does Acceptable quality level (AQL) work?

5) What is AQL 2.5 in garment industry?

6) What is AQL in inspection?

Multiple Choice Questions

1. The AQL level varies are _____.
(a) Method to method
(b) Product to product
(c) Customer to customer.
(d) All of above
2. AQL defects are classified into _____ categories.
(a) One
(b) Two
(C) Three
(d) Four

3. The garment industry identifies _____ of acceptable quality level standards
(a) Four types
(b) Six types
(c) Five types
(d) Seven types

1.6 LET US SUM UP

Acceptance quality level Sampling is the middle of the road approach between 100% inspection and no inspection. Acceptance sampling plans help in distinguishing between the acceptable and the unacceptable lots. And, acceptable quality level is a test as well as assessment standard that prescribes the range of the quantity of damaged parts that is considered acceptable when random sampling segments during an inspection.

1.7 KEY WORDS

Vary	differ, range, extend
Scrutiny	inspection, survey, study
Relaying	Depending
Eliminate	remove, destroy
Privilege	:right, advantage, benefit

1.8 SOME USEFUL BOOKS

https://www.sgtgroup.net/textile-quality-management-blog/is-aql-your-only-solution
https://www.investopedia.com/terms/a/acceptable-quality-level-aql.asp
https://www.fibre2fashion.com/industry-article/7133/accepted-quality-level-in-apparel-industry
https://garmentsmerchandising.com/acceptable-quality-level-apparel-industry/
Apparel Quality Standard and Implementation, Author: Dr. S. Kavitha

Answers

Check your progress

(1) AQL is one of the most regularly utilized terms with regards to quality in the apparel export industry. An acceptable quality level could be a test and / or scrutiny standard that prescribes the vary of the quantity of defective parts that is thought of acceptable once sampling those parts during a scrutiny. In any business method, before accepting the completed items from the manufacturer, the client does an assessment of products. It is most necessary in export garment sector.

They give AQL on the item to the manufacturer. Purchasers do assessment of item as a random process method.

(2) Role of Acceptable quality level is arranged into four different standards, in particular critical, major, minor and slight defects and is utilized by merchants to set the most extreme number of defective units, beyond which a batch will be rejected. For example, shippers will satiate 'I need close to 2.5% damaged things altogether of the whole over amount, on normal more than a few creation runs with the provider. Acceptable quality level tool is typically utilized during the final reviews when the products are ready to be delivered out and are done on a sampling basis. It is crucial to understand that the acceptable quality level should not be utilized as a measure for preventing quality issues of defects. Relaying on definite inspection to identify any defective items or quality issues will result about major delays in production and will be a waste of time and money. It is almost impossible to eliminate defecate items completely. They occur in basically every batch and can occur even after manufactures have checked individual items since visual examinations aren't 100% full verification. In this manner, it's important to guarantee that your raw materials are up to the standard and substandard of the type of quality products you expect to produce. If your raw materials are substandard to being with, you will risk experiencing significant quality issues during the last phases of production. Having control over the quality of your raw materials will decrease quality risks by up to 70%!

(3) The AQL **defects** are classified into four categories:
1. Critical defects: Defects, when accepted could harm users. Such defects are unacceptable. Critical defects are defined as 0% AQL.
2. Major defect: Defects usually not acceptable by the end-users, as they are likely to result in failure. The AQL for major defects is 2.5%.
3. Minor defect: Defects not likely to reduce materially the usability of the product for its intended purpose but that differ from specified standards; some end users will still buy such products. The AQL for minor defects is 4%.

4. Slight defects: Normally 6.5% (defect is only recognizable internally)
Furthermore, the garment industry identifies six types of acceptable quality level standards:

1. Acceptable Quality Level 1%
2. Acceptable Quality Level 1.5%
3. Acceptable Quality Level 2.5%
4. Acceptable Quality Level 4%
5. Acceptable Quality Level 6.5%
6. Acceptable Quality Level 10%

(4) Acceptable quality level (AQL) Products in a sample are tested randomly, and if the number of defective piece is below the preset amount, that product is alleged to fulfill the suitable quality level (AQL). If the acceptable quality level (AQL) is not reached for a specific sampling of products, manufacturers can review the different parameters in the production method to determine the areas causing the defects.

The AQL of a product will vary from business to industry; medical products, as an example, have stringent AQLs because defective products are a health risk.

As an example, consider an AQL of 1% on a production run. This percentage means that no more than 1% of the batch can be defective. If a production run is composed of 1,000 products, only 10 products can be defective. If 11 products are defective, the entire batch is scrapped. This figure of 11 or more defective products is known as the rejectable quality level (RQL).

The AQL is an important statistic for companies seeking a Six Sigma level of control that could be a quality-control methodology developed in 1986 by Motorola, Inc. AQL is additionally referred to as the acceptable quality limit.
(5) A standard acceptance quality level for a garment industry is 2.5% for major defects and 4.0 for minor defects. Additionally, critical defects normally require a zero tolerance acceptance level and any products that fail to meet the set acceptance quality level will undergo 100% inspection.

(6) The acceptable quality level (AQL) is a measure applied to products and defined in ISO 2859-1 as the "quality level that is the worst tolerable." The AQL tells you how many defective components are considered acceptable during random sampling quality inspections.
Multiple Choice Questions
1. (D) All of above
2. (D) Four
3. (B) Six types

UNIT :2 INTRODUCTION OF INDUCTRIAL SEWING MACHINE

: STRUCTURE:

2.0 OBJECTIVES

After studying this unit, students will have,

- Information of industrial sewing machines.
- Learn about the different kinds of industrial level sewing machine.
- Receive information regarding the various parts and detailing the information about this unit

2.1 INTRODUCTION

The various parts of a sewing machine and its functions help the Operator to know the functioning of a sewing machine. There are various types of sewing machines utilized in the manufacturing of garments and other articles. Industrial sewing machines are used for mass production.

Industrial sewing machines differ from traditional consumer sewing machines from numerous points of view. An industrial sewing machine is extraordinarily worked for long term, professional sewing tasks and is therefore developed with superior durability parts and motors.

There are various kinds of industrial machines most of which sew one specialized function. This is different from a domestic home use machine which is designed for multiple purposes.

A Sewing Machine Operator should have the knowledge and skills to operate the various kinds of sewing machine. The Operator should think about the different operations of the sewing machine, its parts, their functions, its connections and the terms related to sewing. There are many common and important terms explained in this Unit.

2.2 DIFFERENCE BETWEEN DOMESTIC AND INDUSTRIAL SEWING MACHINE

Domestic machines are designed to be utilized for a couple of hours at a time, and the user is able to stop and begin a project easily. Industrial machines are designed for a more heavy-duty workload, being able to run for longer hours and deal with more intense projects than a domestic machine.

2.3 INDUSTRIAL SEWING MACHINES

The industrial sewing machine is a further advanced and heavy duty version of the standard home sewing machine. Industrial sewing machines are large utilized for mass production in garment and textile industries. A typical pocket industrial machine can sew 2,000 pockets in an eight-hour production cycle.

An industrial sewing machine is designed to sew a few layers of tough material, like leather, canvas, and vinyl, at one time. The inner parts and motors in a standard commercial sewing machine are excessively for the heavy loads. An industrial machine comes equipped with a clutch and large servo engine for large scale manufacturing avowing major wear and tear in its internal parts.

Industrial machines are made to be durable and to tackle different types of texture like heavyweight fabrics, upholstery fabrics, leather, rubber, plastic and canvas. A wide range of activities utilizing extreme materials are reasonable game for the industrial machine. Some industrial machines have found their way into home industries because they are very hardworking and durable machines.

Industrial machines are made with metal bodies and insides. Since they are mechanical with few or no computerized parts, industrial machines are long-lasting and able to sew for extended periods of time.
As you can imagine these specific industrial kinds of sewing machines are more expensive than domestic machines. There is a decent second - hand trade in industrial machines as many hold their worth reasonably well.

2.4 DIFFERENT TYPES OF SEWING MACHINES WITH TECHNICAL DETAILS

2.4.1 Single needle lock stitch machine

The Single Needle Lock Stitch Machine is the most popular and versatile sewing machine in the industry. The Lockstitch sewing machine forms precise and secured straight stitches on the top and the underside of the fabric. Lockstitch sewing machine uses two threads, one in the needle and the other in a bobbin. The front fabric and back fabric are stitched in the same way. The motion of the needle and the hook correctly timed makes each stitch to be locked.

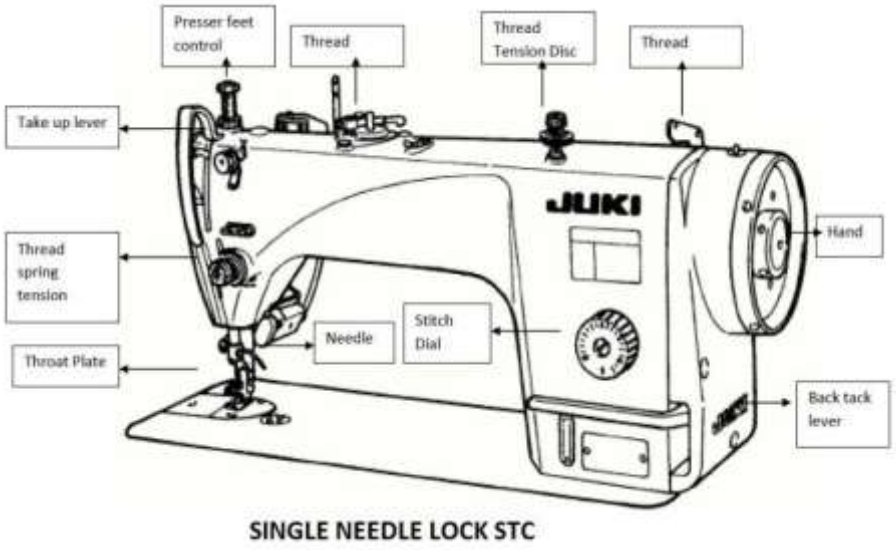

Figure: 1 Single needle lock stitch

2.4.2 Over-lock machine

This machine is popular for stitching over-edge stitches at a high speed. Over lock Machines are available in following specifications. An over lock is a kind of stitch that sews over the edge of one or two pieces of cloth for edging, hemming, or seaming. Over lock sewing machine differs from a lockstitch sewing machine in that it uses loppers fed by multiple thread cones rather than a bobbin. Over lock sewing machine, or serger as it is commonly known, can trim, stitch, and overcast seams as they sew. They can also be used for applications such as inserting a zipper and creating beautiful decorations with certain stitches.

Different kind of over lock stitch machine:
2T over lock machine
3T over lock machine
4T over lock machine
5T over lock machine
6T over lock machine

Figure: 2 over lock machine

2.4.3 Flat lock machine

Flat lock machines are specialized high speed machines. It is also called flat bed sewing machine. In this machine, the stitch is formed by two or more needle threads passing through the material, inter looping on the underside and interlocking on the upper side. Flat lock machine has a vast working space that permits a wide range of sewing applications and is utilized for all types of flat sewing work. The flat lock stitch is sewn by flat lock sewing machine. These machines are mainly used for knitting. It is used in swimwear, sportswear, on baby's clothes.

Figure: 3 Flat lock machine

2.4.4 Feed of the arm machine

Feed of the arm machine is actually a chain stitch machine for chain stitch designs working with sew and stitch. It contains looped instead of bobbin. This machine, stitch can be produced on heavy fabrics, like denim or jeans; it has opportunity of stitching by folding the fabrics. In this machine needle size varies in this machine because of the thickness of the fabrics.

Figure: 4 Feed of the arm machine

2.4.5 Button Hole machine

Button hole sewing machine is used to make hole of button. Various types of button holes are formed by the buttonhole machine. The style of hole depends on the button. Button Hole Machine is used for sewing buttons in the garment.

Figure: 5 Button hole machine

2.4.6 Bar tak machine

Bar tack machine is used for giving secure bar tack stitches. Bar tacking is a type of reinforcement stitching that is done using a Bar tack machine. Bar tack machine is used where the garments in high pressure such as belt loop, pocket corner, at the end of zipper and in that place where more strength is required to support extra load.

Figure: 6

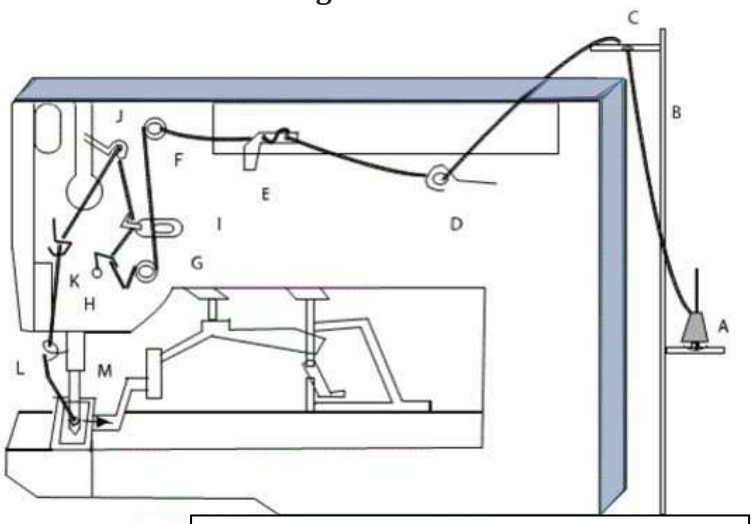

Fig: **Figure: 7 Bar tack machine**

A cone package	E Guide	I Guide	M Needle
B Thread lever	F Tensioner	J Thread take up	
C Guide	G Tensioner	K Guide	
D Guide	H Guide	L Guide	

2.5 TYPES OF INDUSTRIAL SEWING MACHINE BEDS

2.5.1 Flat-bed

Flatbed sewing machine is the most common type of industrial sewing machine used in factories. It is typically used to sew flat pieces of fabrics together.

2.5.2 Post-bed

The distinguishing feature of these machines is a column that rises above the flat base. The bobbins, feed dogs and /or loppers are installed in that raised column. The height of this column ranges from 10 cm to 45 cm

2.5.3 Cylinder-bed

Cylinder - bed machines are a narrow, horizontal column instead of a flat base. Workers employ the cylinder-bed machine for sewing cylindrical pieces such as cuffs, but it is also useful for bulky items such as saddles and shoes. The fabric can pass around and under the column.

2.5.4 Off-the-arm

This is the most uncommon type of sewing used in factories. These machines require the material to be fed along the axis of a horizontal column. The design limits the length of the seam sewn to the length of the column.

2.6 SEWING MACHINE FEEDS

Different industrial sewing machines offer several ways to feed the material. Typically, industrial sewing machines that deliver numerous feed capabilities are more expensive. The main types of feed mechanisms are:

Needle feed: The needle itself acts as the feed mechanism which minimizes slippage and allows workers to sew different layers of fabric.
Puller feed: The machine grips and pills straight seamed material as it is sewn and can perform on large, heavy duty items such as canvas tents.
Manual feed: The feed is controlled entirely by the worker, who can do delicate, personal work such as hole repair, embroidering, and quilting. In industrial sewing machines, it is sometimes necessary to remove the feed dogs to obtain a manual feed.

Walking foot: the immobile presser foot is replaced with a foot that moves with the feed, which allows easier performance on thick, spongy or cushioned materials.

Drop feed: this is probably the most common feed type. Toothed segments called feed dogs lift and advance the fabric between each stitch, with the teeth pressing upwards and sandwiching the material against a presser foot.

2.7 OTHER CONSIDERATIONS

A specific machine's accessible line types can vary. There are a few dozen unmistakable kinds of stitches, each needing between one and seven threads. Plain or straight stitches are the most ordinarily utilized stitches in industrial sewing and include lock, chain, over lock, and cover stitch.

One more significant element is the size and speed of the industrial sewing machine. More costly machines will actually want to

sew more stitches per minute. Large machines give a bigger clearance area under the foot and large bed size.

Many industrial machines are sold without engines and can be operated with either clutch motors or servomotors, contingent upon the user's needs. Clutch motors run continually and capacity to the machine are sent by discouraging a foot treadle to activate the clutch. Servomotors run on demand and are speed controllable also, much as are home sewing machines. Both engine types are accessible for 120 or 240 vac power. Rising of the presser foot is frequently finished with a knee paddle to permit the operator full utilization of two hands. Although many home machines can do a wide variety of operations, production sewing regularly utilizes machines that are set up for specific tasks such as bar tacking, buttonhole making, and so on Machines for tailors and sewers are probably going to be fit for a more full scope of activities.

Check Your Progress

1) What is single needle lock stitch machine?

_____
_____
_____
_____
_____

2) Enlist the different types of industrial sewing machines.

_____
_____
_____
_____
_____

3) Write a note on the over lock stitch machine.

_____
_____
_____
_____
_____

4) Introduce industrial sewing machine.

_____
_____
_____
_____
_____

5) What is the difference between domestic and industrial sewing machine?

_____
_____
_____
_____
_____

Multiple Choice Questions

1) Which feed is common feed type?
A) Needle feed
B) Drop feed
C) Manual feed
D) Puller feed

2) _____ machine giving secure stitch.
A) Bar tack machine
B) Feed off the arm
C) Button hole machine
D) Over lock stitch machine

3) Which machine uses multiple thread cones?
A) Button hole machine
B) Flat lock stitch machine
C) Single lock stitch machine
D) Over lock stitch machine

2.8 LET US SUM UP

This Unit presented a brief summary of sewing machines and their uses. In today's apparel industry sewing machine reduces the time for making garments. Different kind of sewing machines used in the fashion industry has made production very fast and easier. The large scale factories resulted in a great increase in productivity; few workers could produce the same amount of clothing.

2.9 KEY WORDS

Avowing	maintain, assert
Slippage	Decrease, Decrement
Serger	sewing machine used for overcastting to prevent material from flying at the edge

2.10 Some Useful Books

https://www.thomasnet.com/articles/custom-manufacturing-fabricating/industrial-sewing-machines/
https://blog.treasurie.com/types-of-sewing machines/#Types_of_Sewing_Machines
https://bestindustrialsewingmachines.com/industrial-sewing-machines-and-its-need-in-the-modern-era/

Answers

Check Your Progress

1) Single Needle Lock Stitch Machine is the most popular and versatile sewing machine in the industry. The Lockstitch sewing machine forms precise and secured straight stitches on the top and the underside of the fabric. Lockstitch sewing machine uses two threads, one in the needle and the other in a bobbin. The front fabric and back fabric are stitched in the same way. The motion of the needle and the hook correctly timed makes each stitch to be locked.

2) Industrial sewing machine
Button hole sewing machine
Over lock stitch machine
Bar tack stitch machine
Feed of the arm
Single needle lock stitch machine

3) This machine is popular for stitching over-edge stitches at a high speed. Over lock Machines are available in following specifications. An over lock is a kind of stitch that sews over the edge of one or two pieces of cloth for edging, hemming, or seaming. Over lock sewing machine differs from a lockstitch sewing machine in that it uses loppers fed by multiple thread cones rather than a bobbin. Over lock sewing machine, or serger as it is commonly known, can trim, stitch, and overcast seams as they sew. They can also be used for applications such as inserting a zipper and creating beautiful decorations with certain stitches.

Different kind of over lock stitch machine:
2T over lock machine
3T over lock machine
4T over lock machine
5T over lock machine
6T over lock machine

Figure: 2 over lock machine

4) The industrial sewing machine is a further advanced and heavy duty version of the standard home sewing machine. Industrial sewing machines are largely utilized for mass production in garment and textile industries. A typical pocket industrial machine can sew 2,000 pockets in an eight-hour production cycle.

An industrial sewing machine is designed to sew a few layers of tough material, like leather, canvas, and vinyl, at one time. The inner parts and motors in a standard commercial sewing machine are excessively for the heavy loads. An industrial machine comes equipped with a clutch and large servo engine for large scale manufacturing avowing major wear and tear in its internal parts.

Industrial machines are made to be durable and to tackle different types of texture like heavyweight fabrics, upholstery fabrics, leather, rubber, plastic and canvas. A wide range of activities utilizing extreme materials are reasonable game for the industrial machine. Some industrial machines have found their way into home industries because they are very hardworking and durable machines.

Industrial machines are made with metal bodies and insides. Since they are mechanical with few or no computerized parts, industrial machines are long-lasting and able to sew for extended periods of time.
As you can imagine these specific industrial kinds of sewing machines are more expensive than domestic machines. There is a decent second - hand trade in industrial machines as many hold their worth reasonably well.
5) Domestic machines are designed to be utilized for a couple of hours at a time, and the user is able to stop and begin a project easily. Industrial machines are designed for a more heavy-duty workload, being able to run for longer hours and deal with more intense projects than a domestic machine.

Multiple choice Questions

1) (B) Drop feed
2) (A) Bar tack machine
3) (D) Over lock stitch machine

Images reference

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https://industrialsewingmachine.global.brother/enap/buttonhole/he800b/feature/index.aspx

UNIT :3 TOTAL QUALITY MANAGEMENT IN APPAREL INDUSTRY

: STRUCTURE:

3.0 OBJECTIVES

After studying this unit, students will understand,

- Basic information about Total Quality Management.
- Knowledge regarding Total Quality Management Model.
- Get knowledge about Total Quality Management in Apparel industry.

3.1 INTRODUCTION

During the 1950s, the Japanese asked W. Edwards Deming, an American statistician and the management theorist, to help them with working on their conflict torn economy. By executing Deming's principles of total quality management (TQM), Japan experienced sensational financial growth. During the 1980s, when the United States started to see a reduction in its own world market share in relation to

Japan, American business rediscovered Deming. Quality management specialists, Joseph Juran and Philip Crosby, likewise contributed to the improvement of TQM hypotheses, models, and tools. Total quality management is currently rehearsed in business just as in government, the military, education, and in non-benefit associations including libraries (Jurow and Barnard, 1993).

Total quality Management aims towards the achievement of quality in all that one does. Quality means agreement to client's conditions. In today's highly competitive economy, business must face the challenges of continually working on the quality of the products or service. Total quality management includes everybody in the association. It aims standardizing and working on all process in the association. The function of quality has developed from more product inspection to a in-inclusive total quality management. It is presently not simply a technical function; it has become management discipline.

In a manufacturing industry, TQM generally begins by sampling a random choice of the product. The sample is then tested for things that ensure the satisfaction of genuine clients. The reasons for any failures are isolated, secondary measures of the production cycle are, and then the causes for the failure are corrected. The statistical distribution of significant measurements is followed. At the point when parts' measures drift out of the error band, the process is fixed. The error band is generally tighter than the failure band. The production process is in these manners that fixed prior to failing parts can be produced.

It is important to record not just the measurement ranges; however which are selected by failures. After TQM has been being used, it's expected for parts to be upgraded so that critical measurements either stop to exist, or turn out to be much wider. The idea of controlling quality of output item has been acknowledged in the vast majority of the progressive units. Throughout the years the development of Quality control; Statistical Quality Control; Total Quality Control; Quality Assurance and presently Total Quality Management, the most recent stage in the field, including prior stages and adding few more features.

Evolution

The Philosophy of Total Quality Management is advanced, with the change of market situations and customer's conditions time to time.

The well-known pit-falls in total quality administration

1. The TQM approach is not focused

The organization fails to identify the key factors that address quality strategic objectives which are not considered.

2. The efforts is stifled by bur accuracy and paper work Quality Becomes an additional burden rather than an incorporated part of activities. The

standards Of Total Quality management, for example, Simplification and process time improvement are not applied to the Quality process itself.

3. Utilizing TQM as a "Quick – fix"
The organization is in trouble and TQM viewed as a way to quickly solve a variety of problem. Supervisors search for short – term results and are disappointed when they aren't immediately achieved. The program is abandoned and the efforts are wasted.

4. Information is difficult to get and utilize
TQM did not depend on realities since people within the organization don't have the right information with which to decide. An excess of information can often be pretty much as inconvenient as too little.

5. Intra organization clashes slow down TQM
Staff departments in specific are unwilling to give up their "domains". Thus the cross-functional methodology needed by TQM becomes impossible.

6. Poor planning TQM
Sometimes an organization utilizes an "off the rack" way to deal with TQM, often sold by a consultant. Managers don't realize the extent to which TQM should be customized for each organization.

7. Measuring the wrong thing
The organization fails to focus on characteristics that really drive quality. It ignores the way that these imperfections are irrelevant to clients, who are much more interested on-time delivery.

8. Poor management can be an obstacle to TQM and thus success may be than droppedofQuality, administrations take this as a simple thing. Not having any desire to make a commitment, pass responsibility to bring down levels, or build up reality oriented measures, they obstruct the implementation of TQM their subordinates go disappointed with poor level of quality efforts.

3.2 OBJECTIVES OF TOTAL QUALITY MANAGEMENT

- Customer needs, not production, are focus.
- The system becomes more horizontal with everyone working towards a single goal, to serve the client better.
- Everyone is considered in decision making.
- Employee empowerment and obligation replace rigid approaches and methods.
- Cooperation across work is regular.
- Team takes on some of the roles of departments.
- Workers are broadly educated and their jobs are more flexible.
-

3.3 TOTAL QUALITY MANAGEMENT PROCESS

In a manufacturing organization, TQM for the most part begins by sampling a random choice of the item. The sample is then tested for things that make a difference to the real customers. The reasons for any failures are isolated, secondary measure of the production process are designed, and afterward the causes of the failure are corrected. The statistical distribution of significant estimations is followed. At the point when parts' measure drifts out of the error band, the process is fixed. The mistake band is generally tighter than the failure band. The production process is thereby fixed before falling parts can be produced.

3.4 TOTAL QUALITY MANAGEMENT MODEL

In order to develop systematic approach TQM planning and implementation, a good procedure is to take a book at organizations which are of recognized quality leaders in the field. Particularly firms that have been awarded the prestigious Malcoln Baldrige Quality Award, generally recognized as a superior achievement in the field of Total Quality.

1. Leadership

Finest qualities and client orientation flow from senior managers. It's significant that they invest in quality and that they create the systems and methodologies for accomplishing it. It's particularly significant that senior managers should be noticeable in their quality activities. They must be active in quality planning, and should start to lead the pack in similar quality goals to the organization.

2. Data and Analysis

This is the brain center of the quality improvement process TQM emphasizes the management by fact. Reliable and time information are the important ingredients in following quality and making improvement in process.

To accomplish total quality, your organization should think about a wide range of data: client, item and service performance activity, market competition, expenses and supplier information.

3. Strategic Quality Planning

The possibility of total quality management is not for quality to turn into your organization's sole focus. Maybe, you should figure your marketable strategies so that it can add quality to efficiency and eventually cause financial improvement.

Total quality can't be added after you have decided long term or short term plans. The idea possibly makes sense when it is in corporate

into assessment of projection market conditions, Competitive environment and financial circumstance.

4. HR improvement and Management

The success of your TQM effort will ultimately rely upon the use of Human resource. Your workers are the ones who will carry out quality process, who will ensure quality levels are maintained, and who will contribute thoughts for constant improvement.

5. Management of Process Quality

Total quality management consistently get back to "process". This is a result of the emphasis on designing it on. The answer to all quality issues ultimately lies in working on a process or system

6. Quality and Operational Results

The analysis and improvement of cycle is a significant emphasis of total quality management, yet just as a way to achieving results. You should never become so caught up in the planning or implementation of TQM that you fail to focus on reality that it is a result oriented approach.

7. Client Focus and Satisfaction

This is the absolute most significant factor in the Baldrige Award standards. The reason is that client focus is the thing that drives the wide range of various parts of TQM. No organization can achieve quality in emptiness. It is the commercial center that should decide quality at each level.

3.5 IMPLEMENTATION OF TOTAL QUALITY MANAGEMENT

1. Top Management Commitment

Sometimes senior manager become enthusiastic about the ideas and advantages of total quality management. They may be being pressured by a customer to adopt a quality program. They may think that TQM will add the company's reputation.

TQM fails in the organizations where there is enthusiasm however no commitment.

2. Learn out about TQM

Senior manager should spend time learning about total quality concepts prior to moving forward being by reading articles about different factors of TQM. Then, at that point send related administrators to workshop or presentation onto. They might be available through local business association. Final talks with companies, TQM already has experience of knowing what worked for them and what do not.

A few organizations use consultant to learn as much as they can about TQM.

3. Settle on a quality vision

It is significant that you consider your quality vision cautiously. This is significantly more than a simple trademark. It is a statement that joins manager, employee, clients and supplier.

The quality vision is a basic explanation that coordinator your organizations to deal with quality. It should be generally applied to every aspect of your organization activity; however it is specific enough to pinpoint the parts of quality that you want to emphasis.

Considerations while planning vision statement

- Consult with representative from all parts of the organization. Everyone should feel that they have had some input.
- Keep it short. It should be summarized, not explained.
- Make it client oriented: the client can determine the quality.
- Some organizations include reference to the market and competitors, emphasizing that quality mean leadership.
- Don't make it too common. "Excellence" was a well-known term before a few years and we should work like that.
- Focus on needs.
-

4. Establish a TQM team

This is the group that will administer the genuine implementation of total quality management in your structure. It should include the CEO, representative from line and staff department, worker representation and union authorities if a union involved.

5. Set up quality policies and strategies

The team will next analyze how to apply the quality vision to the actual way the competitive business is running. You won't modify all your company polices overnight. This ought to be a cycle completed by the total quality management over a time and on a priority basis.

6. Set quality goals

Never carry out TQM is a vacuum, then again the actual ideas will automatically result. Always watch out for the targets that you went to achieve.

It gives a measuring stick; supervisors and employee can measure TQM results against a realistic set of rules.

It decreases unrealistic assumption. By forming on long-range goals, objective prepares of the "quick solution" attitude that lead to disappointment.

It inspires when the entire organization work towards decreasing imperfections or accomplishing some bench marking, there is a feeling of achievement that boost motivation.

3.6 TOTAL QUALITY MANAGEMENT IN APPAREL INDUSTRY

The outline of the involvement of the textile industry varies widely within the four principles, not only among the different sections of the industry, but also within each of these principles. The alleged level of internal integration of each department of the industry. Provide brief descriptions of some of the exercises in each process area of the industry that help develop the four principles of TQM.

Fiber Forming

Statistical process control and process improvement efforts are strong in the man-made fiber industry. This industry directs a lot of metrics based examination. Leading organizations are beginning to form extensive partnership with clients who utilize group ideas. Such tools as Quality function Development are utilized to upgrade these organizations. The leading organizations additionally are becoming flatter organizations that emphasize a team concept of managing, rather than a progressive one. Dynamic in these associations is given to an empowered functional level of employee.

Spinning

In yarn facilities that have further developed TQM frameworks, the advancement of the partners through instruction and training for such things as technical confirmation, statistical process and quality control, and team improvement, happen on a regular assumption. This education and training is given both within the organization and by outside sources like a company and college. In these facilities, elaborate process improvement programs dependent on employee involvement have been set up. Natural work groups and process improvement groups are utilized to conduct the cycle improvements. Client partnership and satisfaction reviews are likewise utilized.

Knitting

In certain plants in the knitting business, workers are empowered through training in statistical process control and only - in-time manufacturing, to further develop the manufacturing process. Process rearrangements are conducted through quality audits that identify issues and critical path decisions. Other plants have developed process improvement teams to lead work in the process area. As in yarn, client partnerships are additionally a trend.

Weaving

In the weaving business, there are companies that utilize statistical process control and value added analysis. Teams are utilized in these organizations to help in client service and quality. A particular example of client focus is one organization's development of a 48-hour customer service program to help eliminate, face to face, any issues that arise

within their items. This organization additionally utilizes teams to build partnership with clients.

Dyeing and Finishing

The utilization of statistical process control and value added analysis is likewise utilized in this industry of the textile value added chain. Work flow and process duration examination is utilized in organizations further developed in their total quality management system. Cross functional team is also used in the field of customer service and quality improvement.

Apparel

In apparel manufacturing companies, natural work teams that utilize quality improvement tools and measurements are being used. In such advanced organizations, partnership with customer and consumer satisfies.

Cost of Quality

Quality means consistency in meeting customer expectation. The cost of quality is the cost of yarn that met those assumptions, combined with the costs that outcome when you fail to meet them.

Check Your Progress

1) Which points are included in total quality management model?

_____
_____
_____
_____
_____
_____

2) Write down the objectives of TQM.

_____
_____
_____
_____
_____
_____

Multiple Choice Questions

1) What is the full form of TQM?
(A) Total Quantity Managing
(B) Total Quality Measurement
(C) Total Quality Management
(D) None of above

3.7LET-US – SOME-UP

In this unit students are given basic information about Total Quality Management. The information given in this unit will help the students to know a little bit about the role of total quality management in the apparel industry. TQM keeps vital role in improving productivity, product quality and reduce manufacturing cost by reducing rework.

3.8 KEY WORDS

Drift	Float, Gather, Accumulate
Abandoned	Rejected, Jilted, Forsaken
Obstruct	Block, Clog, Jam, Cut off
Emphasis	Significance, Importance, Stress
Cautiously	Alert, Careful, Considerate

3.9 SOME USEFUL BOOKS

- https://textilelearner.net/total-quality-management-in-textile-industry/

Answer

Check Your Progress

1) There are seven points included in total quality management model.

1. Leadership
2. Data and Analysis
3. Strategic Quality Planning
4. HR improvement and Management
5. Management of Process Quality
6. Quality and Operational Results
7. Client Focus and Satisfaction

2) Objectives of Total Quality management

Total Quality requires the management practices to move towards another structure. It includes these segments:

- Customer needs, not production, are focus.
- The system becomes more horizontal with everyone working towards a single goal, to serve the client better.
- Everyone is considered in decision making.
- Employee empowerment and obligation replace rigid approaches and methods.
- Cooperation across work is regular.
- Team takes on some of the roles of departments.
- Workers are broadly educated and their jobs are more flexible.

MULTIPLE CHOICE QUESTIONS

1) (C) Total Quality Management

UNIT: 4 FABRIK QUALITY REQUIREMENTS & INSPECTION

: STRUCTURE:

4.0 OBJECTIVE

After studying this unit students will,

- Have knowledge about fabric quality in fashion industry.
- Learn about how to work apparel industry.
- Basic process about inspection

4.1 INTRODUCTION

Today's customers look for satisfaction just as attractive appearance while purchasing materials for dress and family purposes. At no other time have the stores offered so wide an assortment of fabrics from which to pick, both in yard merchandise and ready - made articles. They come in shades, surfaces, designs, and weaves. Experts are

consistently idealizing new shadings, colors and finishes and making synthetic fibers from materials formerly unthought-of as textile prospects. Textile designers are consistently adding to the variety of patterns, in accordance with present day trends in form and color. Manufactures and inventors keep peace by giving machinery to produce these new designs and fabrics in quantity for fast circulation on a national scale.

When a client goes to a show room to pick a fabric to meet his / her necessity, he / she is astounded by the various assortments of fabrics showed on the table or in the racks, and is completely puzzled regarding which one he / she ought to choose. A sales man further adds to the disarray, expressing all of the products is of acceptable quality and substandard quality merchandise are not loaded in the stores.

The person who buys a fabric wants to know what it is made of, what service it can reasonably be expected to give, will it hold its colors, can it be laundered or dry cleaned, is it warm or cool as compared with others of its kind, will it shrink or stretch and, if so, how much. Few labels give all the facts.

So in answer to widespread demand from consumers, facts on modern fabric construction and finish are together here to serve as a background for judging quality.

4.2 WHAT IS FABRIC QUALITY?

Before we get into all of the different criteria that you can use to assess the quality of a garment, let's go back to basics for a moment: What is quality? And, more specifically: What distinguishes a low - quality garment from a high-quality one?

We need our garments to be sturdy, to last in excess a few seasons. We need durable garments that we can move in without stressing over tearing seams or popping buttons. We need our garments to keep a similar shape they had when we got them, and to neither stretch up nor shrink over the long time. We need things that fit the 0 shape of our body, not mutilate our silhouette or confine our developments. We don't need fabric that pills or blurs after wearing or washing two or multiple times. We need our garments to feel great on the skin, so we can appreciate wearing them as opposed to taking them off as soon as we get home. And finally, we additionally need our garments to look like high quality garments.

What recognizes high-quality from low quality producers are the additional steps they took to ensure garment not only looks like it presently, but will continue to do after multiple wears and washes, that it feels great on the skin and is well-fitted. These 'additional items' take time and money. That is the reason it's so easy to find pretty pieces at budget

stores that end up falling apart after a week: To reduce expenses the producer chooses to focus on making the garment look good on the hanger instead of its quality, because that is what brings in the deals.

Presently, what's critical to note is that the quality and the cost of a thing are not generally related. A few kinds of things are simpler to produce and get directly than others, which is the reason it is absolutely conceivable to track down certain things made at moderate shops. Simultaneously, in light of the fact that a thing is expensive, that tragically doesn't generally imply that the producer utilized the entirety of that additional cash to up the quality of the garment.

So ... how might you ensure you are purchasing quality? The main tip is to consistently take a look at the thing in the tissue, for example not on the web. You could possibly choose whether you like a thing outwardly by seeing pictures, yet to truly survey its quality you should have the option to investigate it very close, to feel it, check the seams and try it on.

There are lots of pointers on what to look for when assessing a garment, but before one starts one must set priorities. Not every single thing in your closet needs to last 20 years. Not every single sock you own needs to be made from merino wool. Going overboard is never practical so first decide on the general approach / strategy to quality.

4.3 FABRIC QUALITY CHECKING PROCESSES IN APPAREL INDUSTRY

Everything from the durability of the clothing to what they look like relies upon the respectability of that fabric. To put it, your garments and linens are just however great as what they seem to be made of.
However, precisely how might you tell when things are made of quality fabric? Here's the how…

One of the primary things to comprehend about checking fabric quality is realizing that various sorts of fabrics present various characteristics – and therefore the standards apply contrastingly to each. For example, you can't expect comparable perfection between a 100 % cotton fabric and mercerized materials. The distinctions don't mean one is consequently the better option.

Here are just a few signs of fabric quality checking process

Fiber Weave: High-quality fabrics feature fibers that are intently and firmly woven together. There ought to be no obvious gaps between fibers as that is regularly a sign of weakness in the fiber quality. These fabrics can tear without any problem. Excellent fabrics have an all the more even mix of vertical and horizontal weaves, which make for a stronger fabric surface.

Color: A best quality fabric ought to have a dye job to match. Look out for unevenness in tone all through the outside of the fabric. There ought to be no streaks or spots. Test fabrics for color fastness too.

Thread Count: This refers to the quantity of thread strands per inch. A higher thread count means the fabric is tighter and sturdier.

Finish: The overall completion of your fabric should show no uneven weaves, unusual wrinkles, or stretching in the corners.

Price: Quality comes with a cost, and as a general rule, curiously modest things are a sign that corners have been cut with regards to either the material or the labor (or both). The value point should match with the item in appearance and quality.

Finished Product: Top quality linens and apparel have a distinct appearance. The seams should be very much sewn. The buttons should be clean and even.

Source: Linens and garments are no cheap investment, so make sure to get your things just from a reliable contractor. Pick a contractor that has years of expertise and experience in the industry. Your contractor should be having the option to clarify the material and manufacture of everything with confidence. Work with an organization, similar to Dempsey Uniform and Linen supply that has a fantastic standing among its companions in the business and with their client base.

4.4 FABRIC QUALITY ASSURANCES IN THE FASHION INDUSTRY

In the fashion business, contest runs especially high among design brands. On the off chance that your quality isn't satisfactory, you risk failing to meet industry and client needs, waste a great deal of time, money and resources and inevitably fall behind your opposition. Many apparel brands are likewise forced to expand their output and maximize benefits and, therefore, experience issues inside their quality management systems.

Quality assurance makes sure that the manufacturing process is high-quality, reliable completed item. It is made up of all the relative multitude of arranged and systematic tasks which are set up to create an item that successfully fulfills the given requirements of the brand and clients. Without quality assurance methods, a level of consistency and unity will not be kept up during the different phases of soft lines manufacturing. It is worth mentioning that quality assurance and quality control often get confused for each other. Quality control is an aspect of quality assurance and occurs from the sourcing phase of raw materials directly through to the last phases of production. It is product focused while quality assurance is process focused. It includes a bunch of exercises being put into place which focuses on identifying and correcting

any defects in the actual final products being produced before they released.

In this way, quality confirmation is a proactive quality cycle which is designed to prevent any defects by testing and improving the way toward designing, producing, evaluating and assessing products to ensure that the desired level of quality is met.

To guarantee that a brand's quality standards and expectations are met, makers depend on quality assurance systems through the process of designing, producing, evaluating, and assessing garments. It is vital that the quality confirmation system is followed during each phase of production. Outsourcing your brand's quality assurance cycles might be a completely new idea for you, and its possibility may seem a little odd at first. However, your brand will experience many benefits while doing as such.

The garment industry's quality fitness depends on different factors like performance, reliability, and durability, visual and perceived quality of clothing. Along these lines, working with a third-party textile quality supplier will guarantee that only the best quality assurance techniques are utilized to meet your brand's quality desires again and again. One of the biggest benefits of enlisting the services of a quality management partner is the expense saving benefits. Monthly overheads that would otherwise have been spent on in-house QC training, staff salaries, sick leave, pensions etc. are reduced.

In view of the agreement and quantities of hours worked, a set month to month charge or hourly rate is resolved while re - appropriating, which eases some other extra expenses related with in-sourcing. Additionally, you save money on costs for framework and costly hardware which is fundamental for assessments and lab tests and so forth Social consistence is likewise a significant theme to make reference to. Quality suppliers will help guarantee that your image meets the necessary business guidelines to remain socially consistent. Neglecting to meet these guidelines will have effect adversely on your image's standing and ROI. Understanding the significance of the expense of value in the clothing business, combined with assistance from industry specialists will guarantee that ideal quality levels are reached reliably.

4.5 INSPECTION

Inspection in reference to the clothing business can be characterized as the visual assessment or survey of crude materials (like texture, sewing threads, buttons, trims, and etc), part of the way completed segments of the garments and totally completed garments in relation to some standards. The principle objective of inspection is the detection of the defects as possible in the manufacturing process so that

time and cash are not wasted later on in either correcting the defect or writing off defective garments.

Purpose of inspection

Fabric Inspection is an important viewpoint followed before garment manufacturing to stay away from rejects because of fabric quality and looking with surprising loss in manufacturing. Fabric inspection for fault / defect rate, fabric construction, end to end or edge to edge, color, hand or feel, length / width, print defect and appearance. Fabric inspection guarantees to limit the rejection of cut panels or rejected garments because of fabric issues. Cutting inspected and approved fabric guarantees completed garment quality as well as reduces rejects, improves productivity and timely deliveries.

The reason for fabric inspection is to decide the quality and acceptability for garments. As fabric is received, it ought to be inspected to determine acceptability from a quality perspective. Some garment makers rely on their fabric providers to perform fabric inspection and fabric defects. In many little organizations, spreading and cutting is finished by a similar work force and fabric is inspected as it is being spread on a table for cutting.

Fabric inspection, mapping or marking defects is important prior to spreading and cutting because:

- The patterns are cut around the defects so as not to include them in the finished garment.
- A cutter's productivity will increase because the defects are already marked.
- Spreading can be done more quickly because the spreader is not also inspecting the fabric.

Fabric inspection machines

Figure 1 fabric inspection machine

Fabric inspection is usually done on fabric inspection machine. These machines are designed so that rolls of fabric can be mounted behind the inspection table under adequate light and rerolled as they leave the table.

Defects can be seen promptly with these machines, as the monitor has a generally excellent perspective on the fabric and the fabric need not be switched to recognize absconds. These machines are power driven or the inspector pulls the fabric over the inspection table. The defects are found, marked and recorded on an inspection form. These machines are likewise prepared to precisely measure the length of each roll of fabric just as screen the width of the fabric. The variety in width of fabric can bring about a greater expense of manufacturing for essential garments since profit margin for this garment manufactures is generally lower than that for fashion garment producers and thusly, maximum fabric use is indispensable.

How much to inspect?

When garment factory receives fabric from the mill, it is difficult to conduct a full 100 % inspection of the fabric. A minimum 10 % inspection of all piece goods prior to spreading the fabric is recommended.

Fabric Inspection Systems

There are various fabric inspection systems:

- 10 - Point System.
- Graniteville "78" system.
- Dallas system.
- 4 - Point system.

4.6 IMPORTANCE OF FABRIC INSPECTION

Fabric Inspection is a significant perspective followed before garment assembling to keep away from rejects because of fabric quality and confronted with an unexpected loss in manufacturing.

Fabric inspection is done for fault / defect rate, fabric development, fabric weight, shrinkage, start to finish or edge to edge shading, color, hand feel, length / width, print defect and appearance.

Fabric inspection guarantees to limit the rejection of cut panels or rejected garments because of fabric faults. Cutting examined and approved fabric ensures completed garment quality as well as decrease rejects, further develops productivity and timely deliveries.

4.7 INSPECTION PROCESS

The reason for inspection is to make judgment on the demeanor of a material to item, regardless of whether to acknowledge or dismiss it. The main objective of inspection is the early detection of defects, criticism of this information to the fitting individuals, and assurance of the reason, eventually coming about in the correction of the issue. Inspection procedure includes approaching material inspection, source inspection, in-process investigation, in - coming goods inspection, seller inspection, and final inspection.

4.7.1. Incoming Material Inspection

The incoming material upon reception is checked.

Core Inspection Modules

- Pick up of samples for In-house or Accredited Laboratories Testing.
- On-site Random Visual Inspection
- Control of accessories and components conformity and quality (trims,
  textile accessories, interlining, embroidery, laces and elastics, etc.)

Benefits

- Ensures ideal conveyances and the right quantity being gotten to plant before production begins.
- Ensures the quality and congruity of embellishments and components match with your assumptions and with components supported at improvement stage.
- Minimizes the negative impact of the inferior components before production begins.

4.7.2 Source Inspection

Inspection at the supplier's place including materials, components, products or documents.

4.7.3 In - Process Inspection

An inspection of all parts, components and materials is carried out during the production process.

For example, in a sewing floor, the inspection process is further divided as:

A. In - Line Inspection

In - Line Inspection means the inspection of parts before they are assembled into a complete product.

Purpose of inline inspection:

- In - line inspection should be conducted at least once a shipment.
- To check the fabric quality in terms of color shade, hand feel and printed patterns against the standards.
- To check the measurements of semi-products against the size specification. When checking this, fabric shrinkage, stretch ability and other factors that may affect the measurement during manufacturing process must be taken into consideration.

B. End - Line Inspection

End - Line Inspection implies inspecting completed goods from the customer's perspective. End-Line Inspection may happen previously or after garments are packed in poly packs and boxes. Assuming it is done after clothing is packed, appropriate size and style markings on the bundle can also be checked.

C. Final inspection
It is the last inspection done before the buyer inspection
All the buyer specifications are checked for

- Form Fit checking
- Measurements
- placement of labels, sewing defects, Sewing- needle damages, , assembly defects, cleanliness, quality of seam, correct trims
- Final hand feel and look
- Packing and packaging

Final inspection can be conducted under the following conditions

- The sewing or assembly process must be finished for the balance quantity
  (20 % of the total shipped quantity)
- The quantity in carton boxes must be at least up to 80 % of the total shipped quantity.

4.7.4 In - Coming Goods Inspection
Inspection done for goods outsourced or components and accessories are inspected upon arrival at the finished garment manufacturers.

4.7.5 Vendor Inspection
Inspection done to check the vendor's facility and operations.

4.7.6 Final Inspection
Final inspection is done to guarantee whether the items satisfy the necessary guidelines and particulars. Final inspection may happen previously or after garments are packed in poly packs and boxes. Final inspection comprises of examining completed garment according to the customer's perspective, for example size measurement, structure fitting and live demonstrating if essential.

Check Your Progress
1. Write a note on In - process inspection.

_____
_____
_____
_____
_____

2. What is inspection?

_____
_____
_____
_____
_____

3. What is fabric quality?

_____
_____
_____
_____
_____

Multiple Choice Questions

1. _____ is Fabric Inspection Systems.
A) 10-Point System.
B) Graniteville "78" system.
C) (A) and (B) both
D) None

2. Which inspections are in process inspection?
A) In- line inspection
B) End- line inspection
C) Final inspection
D) All above

3. What are the few signs of fabric quality checking process?
A) Thread count
B) Dying
C) Sewing
D) Packing

4.8 LET US SUM UP

In this unit we, learned about fabric quality and process in apparel industry. We also learnt fabric inspection and their process. We studied the importance of fabric inspection. This unit gives you knowledge of fabric quality and the inspection process involved in it.

4.9 KEY WORDS

Appraisal	Assessment, evaluation
Sturdy	powerful, strong
Indispensable	essential, necessary
Demeanor	appearance, aspect

4.10 SOME USEFUL BOOKS

https://www.textileschool.com/219/fabric-inspection-in-apparel-manufacturing/
https://www.fibre2fashion.com/industry-article/6281/a-fresh-approach-to-fabric-quality-assessment
https://indiantextilejournal.com/articles/FAdetails.asp?id=4664

https://www.sgtgroup.net/textile-quality-management-blog/the-best-quality-assurance-methods-for-your-brand
Guiding fabric quality FARMERS' BULLETIN NO1831 (U.S. DEPARTMENT OF AGRICULTURE)
Apparel Quality Standard and Implementation, Author: Dr. S. Kavitha

Answers

Check your progress

1. An In Inspection of all parts, components and materials during the production process is carried out. For example, in a sewing floor, the inspection process is further divided as:

A. In- Line Inspection

In-Line Inspection means the inspection of parts before they are assembled into a complete product.

Purpose of inline inspection:

- In-line inspection should be conducted at least once a shipment.
- To check the fabric quality in terms of color shade, hand feel and printed patterns against the standards.
- To check the measurements of semi - products against the size specification. When checking this, fabric shrinkage, stretch ability and other factors that may affect the measurement during manufacturing process must be taken into consideration.

B. End-Line Inspection

End - Line Inspection implies inspecting completed goods from the customer's perspective. End-Line Inspection may happen previously or after garments are packed in poly packs and boxes. Assuming it is done after clothing is packed, appropriate size and style markings on the bundle can also be checked.

C. Final inspection

It is the last inspection done before the buyer inspection
All the buyer specifications are checked for

- Form Fit checking
- Measurements
- placement of labels, sewing defects, Sewing- needle damages, , assembly defects, cleanliness, quality of seam, correct trims
- Final hand feel and look
- Packing and packaging

Final inspection can be conducted under the following conditions

- The sewing or assembly process must be finished for the balance quantity
  (20 % of the total shipped quantity)

- The quantity in carton boxes must be at least up to 80 % of the total shipped quantity.

2. Inspection in reference to the clothing business can be characterized as the visual assessment or survey of crude materials (like texture, sewing threads, buttons, trims, and etc), part of the way completed segments of the garments and totally completed garments in relation to some standards. The principle objective of inspection is the detection of the defects as possible in the manufacturing process so that time and cash are not wasted later on in either correcting the defect or writing off defective garments.

3. We need our garments to be sturdy, to last in excess a few seasons. We need durable garments that we can move in without stressing over tearing seams or popping buttons. We need our garments to keep a similar shape they had when we got them, and to neither stretch up nor shrink over the long time. We need things that fit the shape of our body, not mutilate our silhouette or confine our developments. We don't need fabric that pills or blurs after wearing or washing two or multiple times. We need our garments to feel great on the skin, so we can appreciate wearing them as opposed to taking them off as soon as we get home. And finally, we additionally need our garments to look like high quality garments.
What recognizes high - quality from low quality producers are the additional steps they took to ensure garment not only looks like it presently, but will continue to do after multiple wears and washes, that it feels great on the skin and is well-fitted. These 'additional items' take time and money. That is the reason it's so easy to find pretty pieces at budget stores that end up falling apart after a week: To reduce expenses the producer chooses to focus on making the garment look good on the hanger instead of its quality, because that is what brings in the deals.
Presently, what's critical to note is that the quality and the cost of a thing are not generally related. A few kinds of things are simpler to produce and get directly than others, which is the reason it is absolutely conceivable to track down certain things made at moderate shops. Simultaneously, in light of the fact that a thing is expensive, that tragically doesn't generally imply that the producer utilized the entirety of that additional cash to up the quality of the garment.

So ... how might you ensure you are purchasing quality? The main tip is to consistently take a look at the thing in the tissue, for example not on the web. You could possibly choose whether you like a thing outwardly by seeing pictures, yet to truly survey its quality you should have the option to investigate it very close, to feel it, check the seams and try it on.

There are lots of pointers on what to look for when assessing a garment, but before one starts, one should set priorities. Not every single thing in your closet needs to last 20 years. Not every single sock you own

needs to be made from merino wool. Going overboard is never practical so make sure you first decide on your general approach / strategy to quality.

Multiple choice questions
1(C)
2(D)
3(A)

Source of Images
https://www.google.com/search?q=fabric+inspection+machine&sxsrf=ALeKk00AiCRVcGubJHCdQgufH-HF6e_33A:1623417921912&source=lnms&tbm=isch&sa=X&ved=2ahUKEwjmrbqE14_xAhXUzDgGHY1ICVMQ_AUoAnoECAEQBA&biw=1366&bih=625#imgrc=NB_XlOTNk36VOM

UNIT: 5 ROLL OF QUALITY IN CUTTING AND FUSING

: STRUCTURE:

5.0 OBJECTIVES

After studying this unit, students will understand,

- Importance of quality control in garment manufacturing industry.
- Learn about the objectives of cutting department in garment manufacturing industry.
- Receive information regarding the quality control in cutting department.
- Learn about the objectives of fusing process in garment manufacturing industry.
- Receive information regarding the quality control in fusing department.

5.1 INTRODUCTION

The clothing industry has a complex supply chain where manufacturers source materials, stitch garments and sell goods to retailers. Through purchasers and retailers quality garments reach to end user located everywhere on the world. No wearers will purchase an article

of clothing with low quality and visible defects. So buyers and retailer knowingly don't buy a product that doesn't meet the quality prerequisite. Quality conscious buyers have a strong quality inspection system set up to try not to purchase defective products.
It is absolutely impossible that garment makers can ignore producing quality products. Quality comes first to most of the manufacturer supplying garments across the countries.

Importance of Quality Control in Garment Manufacturing Industry
In this unit we will discuss about role of quality control in garment manufacturing unit.
Quality should be controlled during processing whether it is finished by the operators, supervisors, pressman, garment packers or one employs a checker or inspector. If quality of the product and process is not being controlled from start to end it will cause following:

- High alteration and rejection of garments
- Requirement of extra manpower for checking of products and repair work
- Factory may lose buyers as well as brand value
- Low motivated employees
- Need to work for extra hours
- Delay in production completion
- Ultimately production cost will increase if one ignores quality control area in manufacturing stage

The role of quality control team in manufacturing unit is as below:

- To check raw materials and confirm for use in cutting & sewing processes.
- Check cutting quality, patterns, cut parts.
- Check the sewing process, do 100% inspection of stitched pieces and move quality garment for finishing.
- Checks garments after washing and finishing stage up to packing of goods.
- All the above checks are important to avoid failure of inspection, rejection of shipments and control over manufacturing cost.
- It is to be noticed that the significance of controlling clothing quality may change for the other part of the supply chain.

5.2 OBJECTIVES OF CUTTING IN GARMENT MANUFACTURING INDUSTRY

Figure: Image of Cutting department

Cutting is one of the important stage in garment manufacturing process. Garment manufacturing industry basically follows general process flow. During cutting, the material is cut into desired Pattern shapes based on their requirements.

Objectives of cutting

- **Precision of a cut:**

An appropriate and a smooth cut is one of the objectives of cutting. If clothing is not cut properly it might cause unsettling influence, chances are it may not fit the body well. Subsequently, it is important to cut the pattern shapes accurately. An accuracy of a cut ordinarily relies upon the method of cutting incorporated. A piece of article of clothing can be cut either physically or by computer controlled knives.

- **Clean edges:**

A raw edge of a fabric frequently leads to snagging or fraying. Such defects are a result of improperly sharpened knife.

- **Unscorched, unfused edges:**

Scorching is caused because of heat developed in the knife which comes from friction blade going through the fabric. In the case of thermoplastic fiber fabric for example, polyamide and polyester the raw edges are fused. If the piles are forcefully separated it brings about snagged edges and the hard edges are awkward to wear. A well sharpened, blade with wavy edge, slowing the speed of blade offer great answer for this issue.

- **Support of the lay:**

Cutting should not only provide support to the fabric but also permit the blade to penetrate the lowest ply of the spread.

- **Consistent cutting:**

The cutting framework should not hold to be limited in the height of piles. There are numerous reasons behind same, for example, mechanical or human reasons, such as, toppling or leaning and this can cause weakening in cutting quality.

5.3 ROLE OF QUALITY IN CUTTING

Cutting Quality Checkpoints in Garments Industry
Cutting quality plays a significant role to make the best quality garments. The cutting segment makes the raw shape of garments. If the quality of the cutting section is poor, the defects and rejects of the sewing section will be high. In this topic, we will talk about the quality checkpoints of the cutting section to ensure and supply the best quality cut panel to the sewing department.

Quality checkpoints of cutting department is divided into 5 categories

1. Fabric Quality Inspection
2. Marker Quality Inspection
3. Spreading Quality Inspection
4. Cutting quality Control
5. Cut Panel Quality Inspection

1. Fabric Quality Inspection
After getting fabric from the store by cutting department, cutting quality inspector checks the accompanying fabric information. If all information is correct, then continue to the subsequent stage. The information are-

- Roll to roll fabric shade bunch check
- Fabric GSM and diameter check

2. Marker Quality Inspection
If all data about fabric is correct, the marker quality assessment is run. Marker assessment may run an equal way for saving time. For the most part, the subjects of marker quality inspection checking focuses are -

- Marker length and width
- Marker efficiency and utilization
- Marker type
- Lay quality
- Marker ratio
- All individual pieces of articles of clothing are marked in marker

3. Spreading Quality Inspection
If all data of the marker is correct, the spreading quality inspection is begun. The subjects of spreading quality assessment checking focuses are -

- Checking the quantity of lay as it should not surpass the standards.
- Lay ends check
- Lay height check
- Lay tension check
- Lay length check
- Check as the marker is best fitted to lay

4. Cutting quality Control

Subsequent to spreading activity cutting is begun if there is no relaxation issue. If fabric needs to relax, cutting activity is begun subsequent to relaxing the fabric. The primary checking focuses during cutting is-

- Checking cut panel accuracy with pattern
- Rightly cutting of lay edge checking.
- Checking size mixing

5. Cut Panel Quality Inspection

After cutting the lay, need to check the cut board before final bundling and sending to cutting rack. The main quality checkpoints for the cut panel are-

- Pattern check
- Shade check
- Size wise proportion check
- Fabric check (Spot, Hole, Knot, Slab, Contamination, Lycra out and so forth)
- If fabric is stripe, checking the strip mismatch
- Bundle check

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

5.4 OBJECTIVES OF FUSING IN GARMENT MANUFACTURING INDUSTRY

Fusing

Fusing is a sticky material with a variety of functions that you can use as an alternative to sewing. In this process cut components or separate pieces of a lay (squares of parts) are fused with interlinings that are coated with thermoplastic resin. The material is accessible in woven or non-woven sheets, shapes and strips. Fusing often serves as alternative to sew - on interfacing, which strengthens, supports, adds shape to fabric and wrinkle resistance of a garment.

The Requirements of Fusing

The laminate produced by fusing should show the aesthetic characteristics needed by the designer in the finished garment.

The strength of the bond of the laminate should be sufficient to withstand taking care of during subsequent activities in the garment manufacturing process just as the flexing which takes place in wear.
Fusing should happen without either strike-through or strike back happening. At the point when the softened adhesive resin is pressed into the garment fabric, it is significant that it doesn't go directly through to the face side of that fabric, and that it doesn't return to the outside of the interlining base cloth.

The fusing process should not cause thermal shrinkage in the external fabric. Fusing regularly happens at around 150o C and at this temperature many fabrics may subject to thermal shrinkage.

A further possible effect of the heat of the fusing cycle is that of dye sublimation. Fabrics may change tone to a level which is unsuitable and in a way which causes a mismatch between the fused and unfused parts of the piece of clothing.

Since the fusing cycle involves pressure, there is a risk that pile fabrics might be liable to crushing during fusing. Where shower proof fabrics are fused, there is possibility that the presence of a fused interlining in the garment may wick water through the fabric in the fused areas while the unfused areas remain satisfactorily shower proof. Water resistance interlinings have been created for these situations.

5.5 ROLE OF QUALITY IN FUSING

Quality Control in Fusing:
To control the quality of fusing, determination of interlining and conditions of fusing are vital. The factors affecting the quality of fusing are discussed underneath:

A. Fusing temperature
Ideal fusing temperature is suggested by the interlining supplier. During fusing, if this temperature is not maintained properly, then the fusing performance may debase. Over temperature will deliver strike through or strike back and under temperature will create lacking bond strength. The fusing machine showing fusing temperature should be checked time to time. To check the fusing temperature, Pyrometer or Thermo paper might be utilized. In Pyrometer, there are tests which are to be set inside the interlining and fabric. Then, at that point fusing is done. If the temperature, appearing by both Pyrometer and fusing machine, is same the machine showing temperature is assumed to be right. However, on the off chance that varies, and is important to confirm which one is giving accurate outcome. Under such circumstance, Pyrometer is checked by

boiling water of known temperature. Thermo paper is a kind of scaled paper which is temperature sensitive. Because of impact of temperature color shade of the thermo paper is changed and shows the temperature.

B. Fusing pressure.

Fusing pressure is to be maintained according to recommendation. If the suggested pressure is not maintained then strike through, strike back or insufficient bond strength may result. Hence fusing pressure shown in the dial of the machine should be checked time to time. To check the fusing pressure paper strip and pressing paper strip might be utilized. The pressing factor pill is set inside the fusing bed during fusing. Due to fusing pressure the dimension of the pressing factor pill is changed. Increase element of pressing factor pill is evaluated with the reference chart and fusing pressure is resolved. If the reading of chart and machine differ, the machine showing pressure is defective and should be controlled.

C. Fusing time

Fusing time appearing in the machine is to be checked time to time with the guide of a stop watch.

D. Pilling strength

The bonding strength of combined parts is to be checked by a tensile strength tester and compared with the suggested pilling strength.

E. Washing or Dry cleaning

Because of washing and cleaning, appearance of the fused parts should be unaffected. If it is not maintained subsequent to washing or dry cleaning, the performance of the interlining will be unsatisfactory.

Check Your Progress

Q: 1 Give the name of different categories of quality checkpoints of cutting department.

_____
_____
_____
_____
_____
_____

Q: 2What is the role of quality control team in garment manufacturing unit?

_____
_____
_____
_____
_____
_____

Q: 3Write about the quality control in Fusing.

_____
_____
_____
_____
_____
_____

Multiple Choice Questions

1) Quality checkpoints of cutting department may divide by _____ category.

(A) 5
(B) 4
(C) 3
(D) None of above

5.6 LET US SUM UP

In today's competitive business of apparel export, quality is an important aspect. Global business in Garment sector is dependent on quality characterization because major buyers want to ensure about the quality of the merchandise before the delivery to the consumers. Ultimately, quality is a question of customer satisfaction. In this unit Information is given about 2 important departments of garment manufacturing unit - Cutting department and Fusing. An idea about the requirements of both these departments in garment manufacturing is given. Knowledge about the role of quality control in both these departments is discussed.

5.7 KEY WORDS

- **Toppling –**Overturning, Overbalance, Collapse, Tumble, Drop
- **Debase –**Degrade, Devalue, Reduce in quality or value, Demean.

5.8 SOME USEFUL BOOKS

- https://www.onlineclothingstudy.com/2012/09/importance-of-quality-control-in.html
- https://www.textilesphere.com/2020/05/cutting-department-in-garment-industry.html
- https://www.onlineapparelstudy.com/2020/01/Cutting-Quality-Checkpoints-in-Garments-Industry.html
- **https://textilelearner.net/quality-control-in-fusing/**
- https://www.textileschool.com/425/fusing-process-and-its-requirement-in-garment-making/

Answers

1) Quality checkpoints of cutting department are divided into 5 categories

1. Fabric Quality Inspection
2. Marker Quality Inspection
3. Spreading Quality Inspection
4. Cutting quality Control
5. Cut Panel Quality Inspection

2) The role of quality control team in manufacturing unit is as below:

- To check raw materials and confirm for use in cutting, sewing processes.
- Check cutting quality, patterns, cut parts.
- Check the sewing process, do 100% inspection of stitched pieces and move quality garment for finishing.
- Check garments after washing and finishing stage up to packing of goods.
- All the above checks are important to avoid failure of inspection, rejection of shipments and control over manufacturing cost.

It is to be noticed that the significance of controlling clothing quality may change for the other part of the supply chain.

3) Quality Control in Fusing:

To control the quality of fusing, determination of interlining and conditions of fusing are vital. The factors affecting the quality of fusing are discussed underneath:

A. Fusing temperature

Ideal fusing temperature is suggested by the interlining supplier. During fusing if this temperature is not maintained properly, then the fusing performance may debase. Over temperature will deliver strike through or strike back and under temperature will create lacking bond strength. The fusing machine showing fusing temperature should be checked time to time. To check the fusing temperature, Pyrometer or Thermo paper might be utilized. In Pyrometer, there are tests which are to be set inside the interlining and fabric. Then, at that point fusing is done. If the temperature, appearing by both Pyrometer and fusing machine, is same the machine showing temperature is assumed to be right. However, on the off chance that varies, and is important to confirm which one is giving accurate outcome. Under such circumstance, Pyrometer is checked by boiling water of known temperature. Thermo paper is a kind of scaled paper which is temperature sensitive. Because of impact of temperature color shade of the thermo paper is changed and shows the temperature.

B. Fusing pressure.

Fusing pressure is to be maintained according to recommendation. Whenever suggested pressure is not maintained then strike through, strike back or insufficient bond strength may result. Hence fusing pressure shown in the dial of the machine should be checked time to time. To check the fusing pressure paper strip and pressing paper strip might be utilized. The pressing factor pill is set inside the fusing bed during fusing. Due to fusing pressure the dimension of the pressing factor pill is changed. Increase element of pressing factor pill is evaluated with the reference chart and fusing pressure is resolved. If the reading of chart and reading of machine differ, the machine showing pressure is defective and should be controlled.

C. Fusing time

Fusing time appearing in the machine is to be checked time to time with the guide of a stop watch.

D. Pilling strength

The bonding strength of combined parts is to be checked by a tensile strength tester and compared with the suggested pilling strength.

E. Washing or Dry cleaning

Because of washing and cleaning, appearance of the fused parts should be unaffected. If it is not maintained with subsequent to washing or dry cleaning, the performance of the interlining will be unsatisfactory.

Multiple Choice Questions
Ans: 1 (A)
Reference:

- https://i1.wp.com/www.textileflowchart.com/wp-content/uploads/2015/01/Fabric-Cutting-in-Garment-Industry.jpg?resize=400%2C265&quality=95&strip=all&ssl=1

UNIT: 6 STANDARD & STANDERDIZATION FOR APPAREL

: STRUCTURE:

6.0 OBJECTIVES

After studying this unit, students will have,

- Basic knowledge about standardization of apparel manufacturing industry and their importance.

- Learn regarding different standard operating procedure which are used in different textile
  Industries.
- Know about the important certification for apparel industries.
- Knowledge regarding ISO, and how it can be applicable in apparel industries.

6.1 INTRODUCTION

Standardization

Standardization, in industry is the development and application of standards that allow large production runs of segment parts that can be promptly fitted to different parts without change. Standardization takes into consideration clear correspondence among industry and its suppliers, relatively low cost, and manufacturer on the basis of interchangeable parts A standard is which has been chosen as a model to which articles or activities might be compared. Standards for industry might be devices and instruments used to regulate colour, size, weight, and other item credits, or they might be physical models. Standards may likewise be written mathematical or symbolical depictions, drawings, or formulas presenting the significant features of objects to be produced or activities to be performed. Standards that are applied in an industrial setting incorporate engineering guidelines, like properties of materials, fits and tolerances, wording, and drafting practices; and product standards proposed to depict qualities and elements of manufactured items and embodied in drawings, formulas, materials records, descriptions, or models.

Certain crucial standards among firms are needed to prevent struggle and duplication of effort. The standard activities of government departments, trade associations, and technical associations serve partially to satisfy the needs of the standards set for the nation; however one particular standardizing organization is expected to coordinate the diverse standardization exercises of a wide range of kinds of organizations and promote general acceptance of basic standards.

In the United States the American National Standards Institute (ANSI) performs this function. It doesn't start or write standards however gives the methods by which national engineering, safety, and industrial standards can be coordinated. All intrigued groups may participate in the decision making process, and compliance with the national standard is voluntary. The global body that serves this function is the International Organization for Standardization (ISO). Developing a worldwide standard is more challenging as a result of the breadth of representation and the variety of requirements and perspectives that should be reconciled.

Standardization of apparel manufacturing industry focusing on "cutting section"

SOP (Standard operation procedure) is a process that describes the subtleties in detail in a way that an operator ought to perform a given

activity. SOPs incorporate the purpose behind the activity, the equipment, and materials needed for how to perform the setup and operations needed for the process, how to perform the maintenance and shut down operations completed by the worker, a portrayal of safety issues, and agenda. This SOP is one of a few process documents required for reliable activity of a given process, with other documents including process flow chart. For example, Taylor (1998/1911) accepted that workers were incapable for designing effective process, subsequently the requirement for management to design standard operation procedures. The goal of SOP is an 'ideal' approach to perform a given process. It helps to improving process performance. SOPs are updated and workers are prepared to the new systems. Standardization is the way toward developing and implementing technical standards.

A study was conducted in the cutting and CAD area under a clothing manufacturing company. The cutting area plays an essential role in clothing industries. Cutting segments include various sorts of basic processes like pattern preparation, spreading, cutting, snickering, packaging, etc.

Pattern Preparation: Preparing the layout for garments
Spreading: Spreading of the fabric to form a lay.
Cutting: Cutting of the fabric.
Labeling: It is the cycle of sticking stickers on the piece of clothing for identification and tracking purposes.
Packaging or Bundling: Here the garment components are packaged according to the requirement.
This study presents standard operation procedure in the cutting division of the garment industry. Standardization is the process of developing and carrying out technical standards. Standardization can help to maximize profitability, safety, and quality.

6.2 STEPS FOR DEVELOPING STANDARD OPERATION PROCEDURE

As a matter of first importance, we need to consider the specific spot where we are framing standard operation procedures. Find out the issues present in the cutting department. Likewise, get a few ideas from the workers for standardization. Frame the standard operation procedure for the cutting department. While framing the SOP we need to think about the quality parameters, it should not influence the quality of the product. At that point think about the safety, it should not affect the safety of the labor and try to improve on the operation. Frame the SOP as per the 5 S and kaizen system. It will help to improving the efficiency, quality of the product, safety, effective usage of machines, and equipment.

6.2.1 5 S to transform the working condition towards excellence

5 S is a known technique for reducing waste, increasing productivity, and clear visibility of nonconformance at the work environment. Advanced in Japan, 5 S has been adopted worldwide to change the working condition towards excellence. The methodology has 5 significant steps each of the steps beginning with a Japanese word which gives a sound of "S" subsequently known as 5 S. Those steps are:

- SEIRI means SORTING
- SEITON means SET IN ORDER
- SEISO means SHINE
- SEIKETSU means STANDARDIZE
- SHITSUKE means SUSTAIN

The above system should be implemented in order to get the desired outcomes.

Additional S's

Different stages are sometimes included e.g., safety, security, and satisfaction. These anyway don't form a traditional set of "phases" as the augmentation of these extra steps are simply to explain the advantages of 5 S and not a different or more inclusive system.

KAIZEN

Kaizen – a Chinese and Japanese word for "continuous improvement" when utilized in the business sense and applied to the working environment, Kaizen alludes to activities that ceaselessly improve all functions and include all employees from the CEO to the assembly line laborers. It additionally applies to processes, for example, buying and logistics that cross organizational limits into the supply chain. It has been applied in medical services, psychotherapy, life-coaching, government, banking, and different ventures. By improving standardized activities and processes, Kaizen aims to dispense with it. Kaizen was first implemented in a few Japanese organizations after the Second World War, impacted partially by American business and quality management instructors who visited the country. It has since spread all through the world and is currently being implemented in environments outside of business and productivity.

6.3 STANDARD OPERATION PROCEDURE (SOP) FOR PATTERN MAKING PROCESS

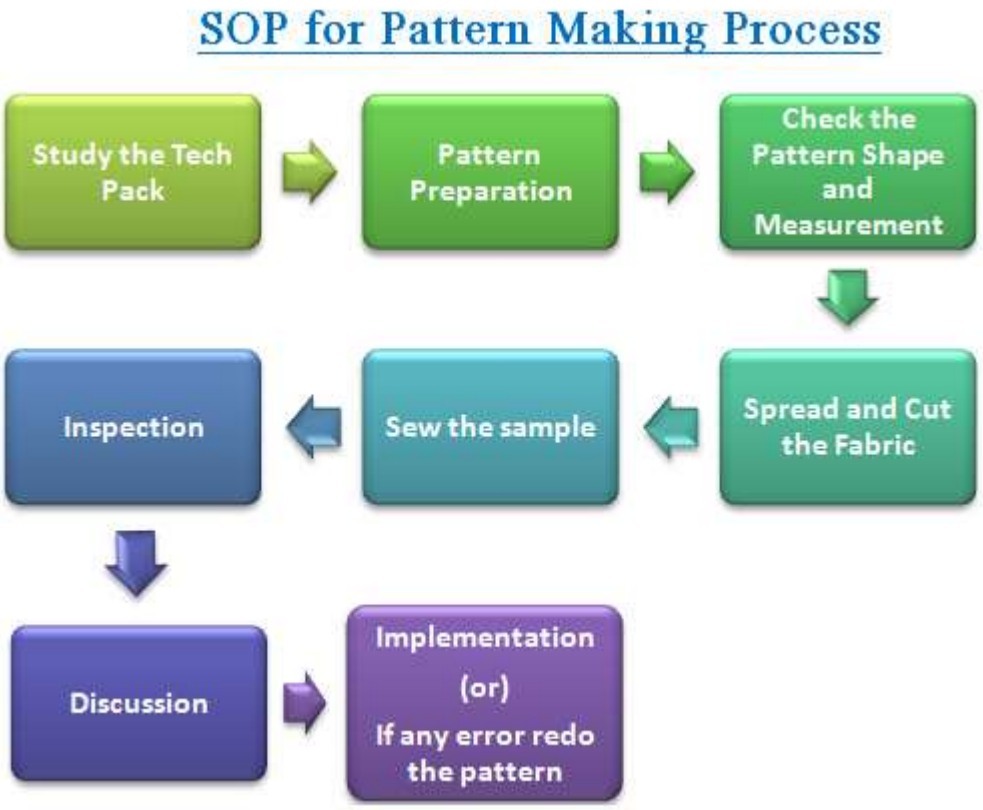


Figure: 1

After getting the order most importantly the pattern master should study the sample and technical package of the style. At that point note down the prerequisites of the buyers. Prepare the pattern as per the measurement and furthermore check the pattern shape and measurements. Cut the fabric and sew the garment. Examine the piece of clothing as per the specification sheet. If there are any changes required then alter the pattern and finally implement the requirements to the final pattern. After that start the mass production by using the final patterns.

Before Standardization

- Quality issues on the pattern shape, measurement.
- It may influence the quality of the garment.

After standardization

- Quality issues on the pattern size and shape. The measurement will be altered before bulk production.
- Eliminating the non-esteem added activities.

6.4 STANDARD OPERATION PROCEDURE (SOP) FOR MACHINE SPREADING PROCESS

Figure: 2

The standard operating procedure for the machine spreading process is shown in figure: 2. Most importantly before cleaning the machine, sharpen a knife, marker length, number of lays, speed of the spreader) clean the spreader and sharpen the blade. Check the width of the marker and the width of the fabric at that time. Set the marker length and numbers of lays in the control panel of the spreader. Set the end catcher of the spreader. Starts the spreading cycle additionally measure the length of the lay by utilizing the measuring tape for verification. Spread the fabric without wrinkles. Keep up the end bit of the roll document. At that point spread the marker on the lay. Pull the lay to the cutting area and start the cutting process.

Before standardization

- Quality issues in the lay like wrinkles and shrinkages.
- Improper maintenance of the fabric

After standardization

- Quality issues are rectified by SOP
- Improving the safety of the operator
- Productivity improved

6.5 STANDARD OPERATION PROCEDURE (SOP) FOR CUTTING BY USING STRAIGHT KNIFE MACHINE

Figure: 3

Standard operation procedure (SOP) for the straight knife cutting process is appeared in the figure: 3. before starting the cutting cycle check the position of the marker in the lay. Notice the necessary details on the lay and fix clip around the lay. The machine should be cut properly for the chain. Check if the cutting blade is evenly sharpened. Oily and make sure there is no oil leakage. Wear a mask and metal gloves for the safety purpose of the operator. Start the cutting process and check the notches and symmetry of the pattern.

Before Standardization

- Improper safety of the operator
- Quality issues in the piece of clothing parts like serrated edge and shape

After Standardization

- Safety of the operator improved
- Quality improved
- Production improved

6.6 STANDARD OPERATION PROCEDURE (SOP) FOR STICKERING PROCESS

Figure: 4

The standard operating procedure for the stickering process is shown in the figure: 4. Before beginning the cycle the operator should wear the mask and clean the stickering machine. Select the colour of the sticker and gum level of the sticker. There are a lot more shading stickers available like red, green, yellow, and so on. Selection of the gum level depends upon the fabric type (heavy, medium, light).

Example: Table:

Size	Color
S	Green
M	Yellow
L	Red
XL	White

Check the gum level before starting the large scale manufacturing. Stickering must be done at the perfect spot of the piece of clothing segment, it should not disturb the sewing process. Finally, check the numbers to the bundle sheet.

Before standardization

- Quality issues in the article of clothing part like a stain

After standardization

- Quality issues are rectified by the SOP
- Productivity improved

Standardization addresses quality issues here and improves the safety of the operator in the same way that the cutting department of the garment industry has improved productivity.

Conclusion

The interesting SOP developed in this unit covers a comprehensive arrangement of aspects in minimizing rework in the cutting section of clothing industry by ensuring quality production. Standardization relies on the type of industry. So manufacturing the quality product is obligatory to support in this global competitive market. Cutting is also the heart of the garment industry, perfect pattern and garment components can only make a quality product like good fit and size. Quality is ultimately a question of consumer satisfaction. Good Quality increase the worth of a product or service, sets up brand name, and develops a good reputation for the clothing exporter, which in turn results in customer satisfaction, high sales. The study clearly shows that by eliminating non-productive activities like revamps in the apparel industries time as well as the cost is saved by Standard operating procedure.

6.7 IMPORTANT CERTIFICATION FOR GARMENT INDUSTRY

By Gus Bartholomew, Supply compass

For some random part of the garment supply chain there can in a real sense be many standards and certifications competing for your consideration. Understanding what standards and certifications you ought to be searching for in your supply chain isn't instinctive. So, to help you in understanding the basics of what we search for when assessing clothing manufacturers, Gus Bartholomew highlighted a portion of the fundamental ones to look to and clarified why they exist.

Standards are technical performance benchmarks and structures, created by bodies of experts. There are obligatory (lawfully required) and voluntary standards; since we're talking about certification at this moment, we will focus on voluntary standards. Standards exist for each part of operations, and very incredibly in effectiveness and reputation. In general, the main categories are (with some overlap); quality management, social responsibility and moral practices, and environmental management and supportability. Suppliers receive voluntary standards by working in consistence to the standard's criteria.

Compliance to a standard doesn't mean the supplier has been certified to the norm. While a few suppliers might be working in authentic compliance, others may simply be claiming to. The issue is; you can't tell which will be without certification.
Confirmation happens when an accredited independent body (an inspector) checks that a supplier adheres to the proper standard. Upon successful confirmation, the auditor typically gives an accreditation explanation.

Let’s look at the nine most important certifications for the garment industry:

Name: ISO 9001 (2015)

The International Organization for Standardization is perhaps the most widely utilized quality management systems created by the largest association in the world.

For a manufacturer to get this certificate it should show its ability to consistently produce items that meet the prerequisites of the clients and administration, in addition to an assurance of applying the illustrated quality administration framework in its operation.
As a brand, you know that a manufacturer with an ISO 9001 confirmation will have a quality management system designed to guarantee a great standard of quality.

Name: SA8000

Designed to protect human rights in the working environment through social accountability. This certification empowers manufacturers to exhibit their compliance. Although this isn't a customer-facing label, it is an ideal standard for purchasers to look for in apparel and textile manufacturing.
Organizations with a SA8000 certification are inspected to encourage them to develop, maintain, and apply socially satisfactory practices in the workplace.

Name: Fair Trade

Created by the World Fair Trade Organization, this genuine standard is dedicated to providing farmers and workers developing nations with higher wages and improved working conditions.
For associations to satisfy these guidelines they should show their willingness to apply fair trade practices across the entire supply chain, not just in their buying.

Name: Standard 100 (OEKO-TEX)

The OEKO-TEX® tests for unsafe substances that depend on the reason for the textiles and materials. The more intensive the skin contact of a product and the more sensitive the skin, the stricter the human-ecological requirements that should be complied with.
The STANDARD 100 by OEKO-TEX® is a worldwide consistent, independent testing and certificate framework for raw, semi-finished, and finished textile items at all processing levels. It also incorporates accessory materials.

Name: Global Organic Textile Standard (GOTS)

GOTS is known for being the world's most transcendent processing standard for testing and verifying natural materials, and is most commonly utilized with organic cotton. This certificate gives a consumer label as well.

To be qualified for this accreditation the textile products being made should be at least 70% organic fiber. There are also strict environmental and toxicological criteria that should be met. With its high level social standards, detailed quality assurance system, and environmental criteria along the entire organic textile supply chain, there is no doubt that a manufacturer with this certification is dedicated to ensuring the climate while producing high quality organic fabrics.

Name: FLOCERT

FLOCERT is a worldwide certification and verification body for Fair Trade items and guarantees fairness across global supply chains. As well as confirming ethical standards for organizations, FLOCERT often gets engaged in the process of making organizations more sustainable. If you are an organization that needs to be more practical but however not

sure of the right steps to take, you can look to FLOCERT to make recommendation and help design a sustainability plan for your business.

Name: Worldwide Responsible Apparel Production (WRAP)

WRAP is an independent, objective, non-benefit group of worldwide social compliance specialists dedicated to promoting safe, legal, humane and ethical manufacturing all throughout the world through certification and education. WRAP implements the accompanying 12 standards; compliance with local laws, prohibition of forced labour, prohibition of child labour, prohibition of harassment and abuse, compensation and benefits, hours of work, health and safety, prohibition of discrimination, freedom of association, environment, security, and customs compliance.

Brands who need to guarantee that the laborers making their products are working in safe conditions should search for WRAP certification. These manufacturers will be following practices related to the established labour guidelines in their nation of operation.

Name: Fair Wear Foundation (FWF)

Fair Wear Foundation works with brands, manufacturing plants, trade unions, NGOs and governments to verify and improve workplace conditions. FWF addresses more than 120 brands, bringing together the key parts expected to make a sustainable improvement to workplace conditions.

Brands should check if their manufacturers are certified by FWF if they focus on having safe working conditions where their products are made.

FWF keeps the track of the efforts made by the organizations it certifies, and works to build the effectiveness of efforts made by organizations.

Name: Blue Sign

Bluesign is a certificate for the textile industry focusing in on lawful compliance according to environmental wellbeing and safety. The certification standard combines aspects of buyer safety, water and air discharges and occupational health, with a specific focus on the reduction of harmful substance use in the beginning phases of production.

Brands who need their textile products to be reasonably made while additionally meeting severe customer safety requirements should strongly consider working with manufacturer certified by Blue Sign.

Be sure to check that the claimed certification is genuine. Most accreditation bodies keep an up to date database of their members on their websites, where you can verify that an organization's certification is genuine. Inevitably the challenge that emerges with supplier certification

will consistently be checking that their guaranteed certifications and operational compliance are genuine.

6.8 ISO CERTIFICATION FOR TEXTILE AND APPAREL INDUSTRIES

What is ISO?

When you purchase a product of clothing like new curtains for your home, or even a fluffy blanket for your bed, do you ever think about where they came from? How would you know they're safe and made to an acceptable level of quality?

ISO is an abbreviation (acronym) that stands for the International Organization for Standardization. The term comes from a Greek word ISOS, which means equal. The International Organization for Standardization is a group of people from many industries who work to create world-wide uniform industrial standards. The standards help guarantee that product, regardless of where they were made, are reliable, safe and of acceptable quality. In general, ISO standards cover considerations like administrative issues and the management systems. They assess an organization's ability to meet customer requirements and offer guidelines to improve performance.

Within the International Organization for Standardization, setting ISO guidelines is done by technical advisory groups related to specific industries. So, textile standards are set by an international committee composed of individuals who work in the textile industry.

ISO 9000 is a group of guidelines for quality administration. It is maintained by the International Organization for Standardization and is directed by the accreditation and confirmation bodies. ISO 9000 addresses quality administration standards as to what an organization needs to fulfill. It evaluates the organizations ability to meet customer and regulatory requirements, quality management system, and provide guidelines to performance improvement. It is one of the famous worldwide standards that have been implemented by countless organizations of 150 countries.

ISO standards focus on:

- A set of methods to cover all key processes in the business.
- Monitor the process and guarantee its effectiveness.
- Quality requirements of customers.
- Checking outputs for defects, and taking corrective actions in proper place.
- Applicable regulatory requirements to enhance customer satisfaction.
- Achieve consistent improvement of performance.

ISO 9000:2000 and ISO 9001:2000:

Prior till December 2000, there used to be ISO 9000, ISO 9001, ISO 9002 and ISO 9003 standards. During December 2000, the International Organization for Standardization merged all of them into a revised ISO 9001 norm. To recognize the prior standards and the revised one, the later was referred to as ISO 9001:2000 or ISO 9000:2000. All things considered, ISO 9000 and ISO 9001 cannot be the same, and 2000 indicates the year of its revision.

6.8.1 Application in the Textile and Apparel Industries

Textile and clothing industries have many convoluted activities and difficulties associated with the course of its operation. Their operation incurs heavy use to the manufacturers. Many textile and clothing industries have implemented ISO standards to lower its working costs and improve the quality of its output, ultimately increasing the level of customer satisfaction. Textile and attire enterprises represent a sizable percent of manufacturing jobs in a global perspective. They employ millions of people directly and indirectly. They structure a massive industrial complex and prove to be a big contributor among the manufacturing industries of any country.

Some textile and clothing industries view ISO certificate is just important as a factor for exports. However, the primary matter of worry in textile industry is that a basic connection exists between the quality of the materials and the quality of the final product. ISO standards empower the industry to improve the quality of raw material input, in this manner reinforcing the quality of a definitive product. This will result in an efficient way to deal with the management, incessant (unending) performance improvement, factual approach towards the decision making process, and a mutually profiting supplier relationship. In this manner it helps the manufacturers in 'Weaving a Quality Industry'.

6.8.2 Market ISO certification

The global competition is heating up with every passing moment. Textile and clothing industries are amidst significant changes. To stay up with the market situation, industries depend more on quality and innovative fabrics, and clothes, and quick response to the needs of the client. Advancements in the fields of nanotextiles, nonwovens, electro textiles, medical textiles, and geo textiles are giving new opportunities to the makers and tap the market. All the while, these chances additionally include them with critical challenges. Associations today engage in many international trade activities, and this certification demonstrates a pre-imperative for their survival in global competition. ISO certificate helps the organizations in market creation and entrance.

6.8.3 Benefit of ISO

Implementation of ISO helps the textile and apparel industries to improve their product and process quality, minimize defective supplies and reworking. Moreover, it can likewise be utilized as a marketing tool.

As it is a well-recognized standard for quality, it shows the clients that the organization takes quality seriously. ISO certified organizations focus more on the quality of its products and activities. It also motivates the workers in improving quality. The expense of implementing ISO is comparatively less expensive to the benefits derived out of it. Many ISO certified organizations emphatically declare that their complete cost went down to a considerable extent with respect to quality maintenance after the implementation of ISO.

Check Your Progress
Question Answer

Q: 1What is standard in apparel industry?

_____
_____
_____
_____
_____
_____

Q: 2What is ISO?

_____
_____
_____
_____
_____
_____

Q: 3 Write about 5S that transform the working condition towards excellence?

_____
_____
_____
_____
_____
_____

Q: 4What is Blue sign Certificate? Write about it.

_____
_____
_____
_____
_____
_____

Q: 5 What are the benefits of ISO?

_____
_____

_____
_____
_____
_____

Multiple Choice Questions

Q: 1 SOP means_____.

(A) Supply Operation Process
(B) State Operating Procedure
(C) Standard Operating Procedure
(D) None of above

Q: 2 ISO means

_____.

(A) International Organization for Standardization
(B) International Overseas for System
(C) International Organization of Supply chain
(D) All of above

Q: 3Before starting the cutting cycle check the position of the _____ in the lay.

(A) Pencil
(B) Marker
(C) Measure tap
(D) Knife

6.9 LET US SUM UP

This unit gives you basic information regarding different certification and standards applied in apparel manufacturing industries. Adherence to the above guidelines will ensure that garments are not only consistent in quality but also meet the expectations of the customers and any other legal obligations an importer may have to oblige by.

6.10 KEY WORDS

Intrigued	Interested
Portrayal	Description, Drawing, Portrait
Augmentations	Additions, Increment, Enhancement,
Redressed	Rectified, Correct, Right
Obligatory	Mandatory, Compulsory, Statutory,Required
Revamps	Reworks, Renovate, Rebuild
Ceaselessly	Continually, Constant
Dispense	Eliminate, Drop, Leave out
Transcendent	Predominant, Ultimate
Accreditation	Certification, License, Authorization

Excess	More Than, Surplus, Overabundance
Reinforcing	Strengthening, Fortify
Definitive	Ultimate, Conclusive, Decisive, Final
Incessant	Unending, Ceaseless, Constant
Convoluted	Complicated, Complex, Elaborate, Intricate
Emphatically	Positively, Absolutely, Of course

6.11 SOME USEFUL BOOKS

- https://www.britannica.com/technology/standardization
- **https://ordnur.com/journal/standardization-of-apparel-manufacturing-industry/**
- https://www.manufacturingmanagement.co.uk/features/what-certifications-are-important-for-the-garment-industry
- https://study.com/academy/lesson/iso-textile-testing-standards.html
- https://www.fibre2fashion.com/industry-article/3746/iso-certification-for-textile-and-apparel-industries

Answer
Question Answer

Ans: 1
It is a document that has been prepared, approved, and published by a recognized standard organization, and it contains rules, requirements or procedures for an orderly approach to a specific activity of apparel industry.

Ans: 2
ISO is an abbreviation (acronym) that stands for the International Organization for Standardization. The term comes from a Greek word ISOS, which means equal. The International Organization for Standardization is a group of people from many industries who work to create world-wide uniform industrial standards. The standards help guarantee that product, regardless of where they were made, are reliable, safe and of acceptable quality. In general, ISO standards cover considerations like administrative issues and the management systems. They assess an organization's ability to meet customer requirements and offer guidelines to improve performance.

Ans: 3
5S is likewise a known technique for reducing waste, increasing productivity, and clear visibility of nonconformance at the work environment. Advanced in Japan, 5S has been adopted worldwide to change the working condition towards excellence. The methodology has 5 significant steps each of the steps beginning with a Japanese word which gives a sound of "S" subsequently known as 5S. Those means are:

- SEIRI means SORTING

- SEITON means SET IN ORDER
- SEISO means SHINE
- SEIKETSU means STANDARDIZE
- SHITSUKE means SUSTAIN

The above system should be implemented in order to get the desired outcomes.

Ans: 4

Bluesign is a certificate for the textile industry focusing on lawful compliance according to environmental wellbeing (health) and safety. The certification standard combines aspects of buyer safety, water and air discharges and occupational health, with a specific focus on the reduction of harmful substance use at beginning phases of production.

Brands who need their textile products to be reasonably made while additionally meeting severe customer safety requirements should strongly consider working with manufacturer certified by Blue Sign.

Be sure to check that the claimed certification is genuine. Most accreditation bodies keep an up to date database of their members on their websites, where you can verify that an organization's certification is genuine. Inevitably the challenge that emerges with supplier certification will consistently be checking that their guaranteed certifications and operational compliance are genuine.

Ans: 5

Benefits of ISO's are as below;

- Implementation of ISO helps the textile and apparel industries to improve their product and process quality, minimize defective supplies and reworking.
- Moreover, it can likewise be utilized as a marketing tool. As it is a well-recognized standard for quality, it shows the clients that the organization takes quality seriously.
- ISO certified organizations focus more on the quality of its products and activities.
- It also motivates the workers in improving quality.
- The expense of implementing ISO is comparatively less expensive to the benefits derived out of it. Many ISO certified organizations emphatically declare that their complete cost went down to a considerable extent with respect to quality maintenance after the implementation of ISO.

Multiple Choice Questions

Ans: 1 (C)
Ans: 2 (A)
Ans: 3 (B)

UNIT: 7 COMPLIANCE CODE IN GLOBAL APPAREL

: STRUCTURE:

7.0 OBJECTIVE

After studying this unit, students will be able to,

- Understand the meaning of compliance and get the knowledge of its categories.
- Knowledge regarding importance of compliance in garment sector.
- Understand some compliance challenges that fashion brands and textile factories face.

7.1 INTRODUCTION

Compliance means the complete alliance of various parts of business-whether commercial, financial, or regulatory. It requires following rules, both external and internal. Compliance with law and regulation must be managed as an integral part of any corporate strategy. And with this a compliance management program can produce positive result at several levels.

The always growing list of compliances has made many exporters and exporting nations to sit up and make a note of what is expected to be complied with as desired by the global retailers-by anybody, who wishes to trade any products; for your situation, textiles and garments.

A few groups think that the possibility of common compliance code for textile and apparel industry started in 2005 for example after export quantities were destroyed; however not. Assuming it were along these lines, maybe all legislations relating to labour should have begun from 2005 only, which is not the case. The reality of issue is that it was during British time that the labour laws were established and authorized, which were revised from time to time. A large number of labour laws including Factories Act, 1948, Payment of Gratuity Act, Minimum Wages Act, Payment of Wages Act and the State Factories Act were all essential for what has now been designed and assigned as Compliance Code. It is trendy to talk as far as Compliance Code or Common Compliance Code (CCC), which were, in fact nothing more and beyond what had effectively been enacted (established) and authorized. It is, notwithstanding, a different story that we, as a country operations as a group as somebody had properly called us, have a strong tendency not to agree with the law and specialize in discovering loopholes and afterward feel proud for our this achievement.

It is, however, genuine that the issue of compliances didn't come up earlier in as big a way, as it came up later on, when standards were replaced by what is known as Free Trade which evidently came into force with effect from past 12 PM of 31 December, 2004.
Be that as it may, all our labour related legislation did not include another requirement for example environmental laws and that also was for the simple reason that environment had not gotten the fancy of the global

retailers, most Western retailers, however that option has been made and it included the list of requirements that our industry needs to meet with.

Why Compliance Code?

AEPC says, With many garment exporting nations in Asia and somewhere else dealing with issues identified with expanded necessities for numerous compliance accreditations the central worries among purchasers are ecological laws and regulations, labour reforms, wage identification and segregation, over time, flexible working hours, health and security issues and working conditions.

As per AEPC, the Compliance issues are generally classified under social, environmental and technical categories and that Compliance code is needed for expanding national competitiveness in terms of social compliance, diminishing burden on manufacturers and increasing competitiveness of small scale manufacturers. The entire process begins with examination of facility, requirement analysis of buyers, analysis of national and international laws and guidelines, designing and creation of progressive structure of common code, planning of design with specific laws and regulations and development stage which incorporates a detailed review of the common code, audit and approval by independent panel made up of lawful promotion industry experts.

If the Compliance issues, which have been classified by AEPC, under social, environmental and technical categories, had been clearly explained, it would have been very edifying**.** Since the Compliance issues have been classified, these must have been listed and classified later.
Maybe, just one of the characterized classifications for example climate has been talked about, at much later stage, when the Note says, the code will guarantee compliance with environmental prerequisites like domestic sewage, chemicals, unsafe substance and waste handling storage, material safety information sheets, laborers awareness, chemical management for pregnant ladies and young workers. Personal protective devices and use, ventilation and recycling practices. The details of issues of different classifications have not been mentioned for the benefit of reader.

7.2 CATEGORIES OF COMPLIANCE

Meaning: Compliance means satisfying / conforming to certain standards, rule, regulation, policies, SOP's or objectives set out by association. It can to be:

National legal requirement
International legal requirement
Client/Consumer Requirement
Certification requirements
Internal Policies, procedures, rules

So, in this unit we will list down compliance requirements in the Apparel sector.

Categories of Compliance:

There are various kinds of compliances that are required from a textile unit to fulfill. Types of compliance with their brief introduction are as per the following:

1. Social / Labor Compliance:

This is the kind of compliance where you are needed to satisfy labour law requirement as required by National Labour Law or ILO and some best practice requirements by client. It covers:
Payment issues
Working Hours
Working Environment
Disciplinary practices
Labor Practices

2. OHS Compliance:

Fire Safety
Machine Safety
Electrical Safety
Physical / biological Hazards
In this kind of compliance you are asked to satisfy occupation, health and security requirements. The standards will be set out by local authorities or standards made by customers. Customers can also ask that you fulfill different worldwide standard for example OSHAS and so on. It covers:

3. Environmental Compliance:

Here an industrial facility needs to agree with Environmental requirements that can be local or international or requirements set out by client. Environmental Compliance covers:
How you manage waste of your facility?
Do you have environment permit or not?
What is the impact of your activities / processes?
How do you manage your processes / activities to make it environment friendly?

4. Product Quality Compliance**:**

Product quality is a vital compliance area. This is the place where there is zero tolerance. If a product is certainly not a quality product, you will not get the customer. In Product quality compliance, we consider:
How a company manages its products?
How a quality product is guaranteed?
What are the faults?
How the defects are removed?
How material is handled?

5. **Security Compliance**

This compliance is for the mostly export oriented industries. This compliance emerges because of terrorism and client information security issues. It will include:
Who has access to certain areas?
Who has access to data/files?
How products are packed?
How some areas are restricted accesses?
How site security is ensured?
How product design security is ensured?

6. Structural / Building Compliance:

After collapse of Rana Plaza in Bangladesh, global brands have now been trying to ensure that this doesn't occur once more. Brands are directing structure evaluation.
What is the strength of building?
What is the load capacity of the building?
What are defects in the building?
How buildings can be made safe?

7. Certification Compliances:

There can be various kinds of certification for example, Management system certification, social, environmental, quality, safety accreditation against different standards like, ISO standards, BSCI, SMETA and so forth there may be some special requirements of these certification relying upon standards for example how documents are managed and so on.

Conformance with these requirements relying upon their applicability is compulsory. If some requirements are not meet, it prompts Non-Conformance or Non-Compliance.
If there is any genuine non- compliance then:
Client can stop business
Legal authority can seal the company
Certification body can cancel certification

7.3 IMPORTANCE OF COMPLIANCE IN APPAREL INDUSTRIES

1. Social

The value of social compliance states that one of the biggest challenges production facilities face, especially in China is a high staff turnover rate of 30 %. The direct and indirect expenses engaged with replacing staff members every 3 years are immense, which incorporates the cost of retirement, selections, training just as loss of productivity.
Since the clothing industry depends intensely on human resource, a safe environment and great working conditions are fundamental for faithful workers who guarantee that production is fast, reliable, and proficient. Giving safe industrial facility working conditions reduces a

manufacturing plant's staff turnover because the workers appreciate the association they work for which definitely prompts higher efficiency, responsibility, and performance. Furthermore, manufacturers that view garment factory social compliance as a necessity, experience financial advantages for both the factory and the workers as workers who are in an ideal situation are more empowered and are glad to work towards achieving company goals. Less money should be spent on goods that contain defects or made ineffectively as workers are confident in producing garment that satisfy the set standards in regards to design, texture, quantity and most importantly, quality. Being known as a brand or association that is socially compliant also has effects on your brand reputation and client faithfulness.

The SA 800 Standard

For garment industry to be socially compliant, the 9 prerequisites of the SA 800 Standard should be met. The SA 800 standard is one of the world's leading social standards utilized for measuring social compliance and implementing international labour standards. It was set up by a non-governmental, multi-stakeholder organization named Social Accountability International who endeavors to eliminate sweatshops by promoting ethical working conditions, labour rights, corporate social duty and social dialogue.

The 9 SA 800 social compliance requirements are:

Child Labour: No children younger than 15 years age might be employed by a production line.
Forced labor: No individual might be employed by a production line if they haven't offered to do so voluntarily or be forced to work under the threat of punishment or reprisal.
Health and safety: A safe and healthy working environment should be given by the factory that should likewise prevent any expected health and safety incidents and work related injury or illness from occurring.
Freedom of association and collective bargaining: All staff reserves the right to form, join and organize trade unions and to bargain collectively on their behalf.
Discrimination: A manufacturing plant is prohibited from taking part in discrimination in recruiting, compensation, access to training, promotion, termination or retirement.
Working hours: An industrial facility should follow applicable laws, collective bargaining arrangements and industry norms on working hours, breaks and public holidays.
Disciplinary practices: A processing plant is denied from participating in or tolerating the utilization of corporal punishment, mental or physical coercion or verbal abuse of employee.
Remuneration: The right of staff to a living pay must be regarded by the manufacturing plant.

Management system: Compliance must be assessed and implemented to the SA800 Standard through developed policies and procedure.

As mentioned above, even though set compliance standards exist, garment manufacturing plants around the world has as yet found violation of social compliance and are charged on counts of unreasonable wages, extensive working hours, exceeding local over time limits, health and safety infringement and more. These infringements have prompted numerous tragic events which could easily have been prevented, for example, the Bangladesh garment company blast which happened recently, killing 10 workers and injuring 50. Therefore, social compliance can't be neglected. It is fundamental for garment manufacturing plants to consider conducting a social compliance audit. A social compliance audit can be utilized as a measuring tool for determining a factory's social compliance standards however isn't a solution for guaranteeing that social compliance standards are met. Social compliance is hard to achieve, yet working with a textile management solution provider, limits the results of not meeting social compliance standards and helps to setting up an improvement plan going ahead.

2. **Ethical**

This topic gives details of what ethical compliance in fashion is, the reason it's significant for organization to be effectively engaged with better ethical compliance and how ethical fashion affects everybody.

What is ethical compliance?

Ethical compliance generally alludes to an organization conforming and operating within the laws and regulations, following rules set by the government authority for organizations. A broader understanding of compliance is likewise focusing on workers sticking to internal rules of a business, just as companies working with conditions to which employees can ethically complete their work.

Large numbers of business will often have entire departments dedicated to ethical compliance, to guarantee that the company conforms to the laws and guidelines that the government has set out, and because of the broad and wide range of laws companies are dependent upon, this can be a large task. Many companies additionally regularly go through compliance training, which can expose workers to the significant laws and guidelines that the company is dependent upon.

Why is ethical compliance important?

While numerous individuals can expect that adhering to rules and regulations is just as easy as following an agenda, ethical compliance is about ensuring there is no corruption within an organization and ensuring there are sufficient procedures set up to risks the dangers of pay off and corruption, both in your organization and in business relationship.

It is important because:

It creates a good company culture: Employee wants to work for a business they can trust. Feeling safe, valued and respected is a significant part of a job and something everything wants.

Misconduct decreases: At the point when you adhere to a set rule and outline expectations for reasonable treatment and ethical behavior, it sets the vibe for the rest of the business to follow and be held towards.

Increases productivity: Research has shown us that maintaining ethical practices upgrades better performance, particularly when the code of conduct rules line up with an employee's personal values.

3. Technical

Technical Audit in Apparel Industry

Technical Audit (TA) is a very important task for garment manufacturing. Each purchaser does a technical audit before placing an order to any garment industry. In this topic, we will discuss about what is a technical audit in the apparel industry and how we can utilize and for what purpose a technical audit fulfills. Numerous garment purchasers have their own technical audit checklist; audit should be done on a routine basis diligently. Through Technical Audit, auditors actually evaluate an assurance of the ability of the garment makers to make export quality garments. The technical audit agenda can vary from buyer to buyer.

Objectives of Garments Buyer Technical Audit

1. Ensure the QMS is effectively
2. Audit quality control system
3. Ensure compliance with customer quality standard
4. Ensure client manufacturing and process control requirement
5. Apply best prescribed procedures in garments manufacturing.
6. Ensuring effectiveness, efficiency, improvement, and customer satisfaction.
7. To get excellence & sustainable results in the long run of customer product quality and as a supplier.

Types of Technical Audit

4. **Internal Audit / 1st Party Audit**

It is performed by processing plant internal Auditor assigned by factory management. Internal auditor report for factory management, and take corrective action. Here supplier has a scope of improvement according to client quality and technical requirement by their own (internal) audit system.

5. **Client Audit / 2nd Party Audit**

Performed by client / buyer on own and reports to their supplier and request restorative activity, accessible scoring or rating system to classify supplier. A client audit is vital for the supplier.

6. **External Audit / 3rd Party Audit**

A third party audit is an external independent audit performed by a party hired or approved by the client to verify their process standard and prerequisite. Third party is a contracted organization that works for the client, make a report or certify supplier for a specific period.

Technical Audit Categories / Sections for Apparel

1. Factory Warehouse (Incoming Goods Storage)
2. Trims & accessories area
3. Fabric Inspection
4. CAD
5. Cutting
6. Pre-Production
7. Fusing
8. Sewing
9. Finishing
10. Final Inspection
11. Quality Control
12. Packing/ Finished Goods

Technical Audit Criteria for Garments

1. Factory Warehouse

2. Product identification, FIFO-LIFO, storage items tracking system and inventory
3. Mold prevention system, relative humidity %, and controlling system
4. Trims, accessories and fabrics storage using pallet or rack
5. 5S implementation effort

2. Trims and Accessories Inspection

1. Approved trim card for every running style
2. Inspection procedure and lighting
3. Rejected products isolation and keeping an isolated area
4. Third-party or supplier internal test report of all Trims and Accessories.
5. Complain against the failed item to the supplier and replace, show documents.

3. Fabric Inspection and Procedures

1. Fabrics inspection system, procedure, and Report (Follow 4 point or 10-point system)
2. Shrinkage test accuracy
3. Light box for shade evaluation
4. Color evaluation, shade grading as per customer requirement

4. CAD

1. Pattern Library and E-pattern library
2. Marker calibration, verification (pattern or dies, bundles, direction) and Report
3. Making separate pattern as per shrinkage variation

5. Cutting

1. Grain line / notch indication, cut mold, stripe & check matching indication
2. Pattern measurement for verification
3. The process sequence of fabric cutting
4. Fabric relaxation procedure and report documentation

5. Spreading quality control- Table marking – Ends - Leaning-Tension-Narrow Goods-Remnants-Counts-Ply High-Marker placing-Fabric Flaws
6. Cutting quality control- Miss cut – Rugged cutting – Notches-Matching Plies and pattern check
7. Bundling and numbering separation, its accuracy and proper report to sewing
8. Cut panel inspection
9. Preventive Maintenance system and report
10. 5S implementation effort
11. Using all types of personal protective equipment. Cutting safety materials: Hand gloves, mask

6. Sampling and Pre-production

1. Pre- Production meeting for every style and keeping the document
2. Sampling and pattern correction before bulk start

7. Sewing

1. Proper sewing allowance versus. machines and making before wash measurement spec
2. Needle Control Policy; Sharps tools and Staples control
3. Preventive Maintenance system and report
4. Roaming QC Audit system
5. Over clock machine fabric trimming check, keep guide for maintaining proper seam allowance
6. Approved trim card and approved sample for each running style
7. In-process quality checkpoint, defects type record, and alteration
8. Mockup (with written instruction) or JQS (Job quality standard) for every sewing operation
9. Checking garments for construction, seam quality, and overall garments appearance.
10. Garments measurement and construction checking comparing with approved sample and customer provided spec
11. Seam puckering, SPI, stitch tension, needle mark and all others stitching quality
12. Approved lighting condition in all QC checkpoint, the customer required checking report
13. 5S implementation effort

8. Fusing

1. Interlining bonding strength, temperature, time and pressure

9. Finishing

1. Pull test of snap and shank button and pull tester machine calibration
2. Quality inspection system and report

3. Metal and needle detection in place and effectiveness

4. Garments measurement procedure as per customer requirement
5. Preventive Maintenance system and report
6. Excessive WIP, dumping garments in finishing workplace
7. Approved lighting condition in all QC checkpoint, the customer required lux and checking report

8. Pressing system. (Temperature, steam, Iron shoe, and head)
9. Show the approved sample or customer provided data for attaching finishing sticker and folding.
10. Garments AQL Audit
11. 5S implementation effort

10. Carton Warehouse

1. Carton keeping system
2. Mold prevention system, relative humidity %, and controlling system
3. Packing, inventory and delivery/shipment system
4. Moisture percentage checking in garments
5. Carton weight report, scan and pack system

11. Final Quality Audit Room

1. Location of Audit room, separated from the production area or not
2. Available necessary for final Audit; approved sample, trim card, inspection table.
3. The customer required a light source

12. Documentation to Show During Technical Audit

1. Complete own Quality control manual of a factory
2. Quality auditors training and assessment exam
3. Quality management system and their activities
4. All section SOP separately as following
   - Trims and Accessories inspection procedure
   - Fabrics preparatory procedure
   - Cutting Quality control SOP
   - Sewing quality control SOP
   - Finishing quality control SOP
5. Analysis with section quality result and setting target
6. Factory performance report from client end
7. Factory layout, evacuation, management, and quality organ gram
8. All machine alignment report attaching with the machine by the supplier, 3rd party or own calibration system
9. Quality analysis and control report
10. ISO, ASQ or any other international certificate
11. Quality tools calibration report. E.g.: Measurement tape

Audit CAP and Follow up Improvement in Garments

End of an audit, the auditors makes a report with their remarks where the requirement doesn't fulfill according to standard or client prerequisite. Audit result by the scoring system by marks (Performance rate) or classify good, alert and risk. The supplier takes corrective move as per 3rd party auditor or client recommendation for their customer prerequisite.

CAP Report Includes

1. Audit observation / findings
2. Auditor suggestions / Comments
3. The corrective action plan of supplier
4. Estimated completion date
5. Progress status
6. Follow up improvement

Follow up Improvement of Audit

According to the audit checklist report by an auditor, a provider has to fill up client requirements by a specific time. The client follows up on the improvement of the CAP every week or month. If the number of CAPs decreases after each month, the supplier improves towards the client's requirement or where the buyer's audit improves over a certain period of time.

7.4 COMPLIANCE CHALLENGES FASHION BRANDS FACE

The fashion industry has been under fire for a few of years at this point. Manageability and eco-conscious customers are requesting more transparency with regards to the role textile production plays not only in environmental pollution but also in regard to the frequently technical work conditions for laborers, just as to the industry's' promotion of fast fashion expendable culture. Fashion brands should accept compliance to fulfill those rising needs and accomplish viable and sustainable change.
That is actually quite difficult, however. In this unit, we'll discuss the difficulties or challenges textile and fashion brands face in adhering to compliance guidelines in their industry and how you can deal with conquer them.

Consistency is the adherence to legal or social commitments or requirements; in fashion, that likens to conform to recognized standards across the industry, including
Work conditions,
Garment quality,
Environmental effects, and
Human rights.

Failure to be compliant can have shocking outcomes across the entire chain. Most brands know about this and want to stick to the regulations.
But, it's a jungle out there. A set of all- encompassing compliance guidelines coordinated and enforced on a worldwide scale simply doesn't exist. Compliance regulations are set by the country your business is enlisted in and by the country which your suppliers are producing their products - yet, in most cases, that includes at least two different nations, which means you have to adhere to at least two different sets of rules.
There are standards and certifications on both a worldwide and local scale that fashion brands can follow, like the GOTS, ISO 9000, and very specific accreditation like natific's factory and supplier certification. A large number of these guidelines, certificates, and accreditation are recorded here by the Textile Standards and Legislation.

We should have a look at this and other predicaments sustainable and ethical fashion brands face in trying to adhere to compliance regulations.

1. Price king

"However much brands talk about compliance and worry for laborers' rights and safety, the awful reality is that price is as yet ruler (king)." ~ Edward Hertzman In 2013, the Rana Plaza production line in Bangladesh collapsed, killing 1,100 people. This tragedy stirred the world to the truth of garment manufacturing conditions in Asia.

The issue exists in our western consumerist society and in our demand and expectation for essential necessities, like to attire, to be affordable, for example very cheap. This leads the so-called "fast fashion" concept, by which the entire business has been designing, producing and selling apparels for quite a long time. Buyers reward retailers for putting up recent trends for sale to the market instantly at scratch and at bargain basement prices and margins. In such a situation, things like basic liberties, sustainability and compliance are left by the wayside.

But, the industry is going through an adjustment of mentality. An ever increasing number of buyers are willing and surprisingly glad to pay more for dress produced according to compliance regulations. Gradually, the entire industry is backing away from the fast fashion concept. Smart organizations are now taking advantage of this new trend by making their ethical fashion attempts part of their branding.

2. Supply chain complexity

As we've recently discussed, supply chains completely are a complex aggregation of data - including compliance regulation and how suppliers, logistics providers and brands themselves are following them. Transparency, here, is key. Furthermore, consumers are demanding it.

Specifically in fashion, 67 % of buyers express that transparency plays a significant role in their buying choices. And keeping in mind that customers' thirst for transparency is driving retailers to set up how they source items and impart about their practices, it additionally opens the door for smart brands to get ahead and utilize transparency as competitive advantage.

One way is to work with outside certificate associations, as incredulous shoppers are going to third parties to affirm brands' claims and do their homework for them. Independent outsider certification is the most ideal approach to verify a product's ecological claims, believe 76% of consumers. Various associations set different standards to verify all manner of product claims, utilizing identifications thus called "trust seals"

to helps buyers with deciding whether products satisfy given sets of standards, for example:

Fair Trade Certified
USDA Organic
Bluesign

Another kind of third party that fashion brands can team up with to ensure customers of their supply chain's transparency, including transparency for compliance guidelines, are platforms and software that offer an overview of a brand's entire supply chain. In fact, our Bomler BOMBOS transparency software links all parties involved - suppliers, brands, sellers, providers, buyers - and gives them all understanding into any apparel item's journey down the supply chain.

3. Implement a “code of conduct”

To get themselves free from any risk, retailers often implement a "code of conduct", which expresses that overseas suppliers should consent with their local country's health, safety, environmental and labor laws. Be that as it may, particularly in developing nations, these are often hardly in excess of a set of poorly developed and easily bypassed rules.

Despite being aware of this irregularity, brands keep on declaring by the strength of their codes and follow this practice. However, progressively, consumers are catching on to this affectation and brands would be very much encouraged to correct this "oversight".

Obviously, the complexity of supply chains and overall compliance guidelines makes this very difficult, even for brands whose inherent goal is to guarantee the satisfaction of compliance regulations by their suppliers. But, it's not impossible. Bomler's BOMBOS software additionally provides a solution here with the compliance portal. It permits compliance officers a simple glance at suppliers' compliance guidelines and how they're being followed. Compliance officers will adore this apparatus for its time saving abilities. For example, any progressions you make to your worker information, audits, certifications, Q & A will appear for your whole network of clients and suppliers utilizing the Bomler software. Your days of researching and updating every scrap of data for each step of your supply chain are over.

Check Your Progress
Question Answer
Q: 1What is Compliance?

_____
_____
_____
_____
_____
_____

Q: 2What are the benefits of Social compliance for textile industry?

_____
_____
_____
_____
_____
_____
_____

Q: 3 Mention objectives of Garments Buyer Technical Audit?

_____
_____
_____
_____
_____
_____
_____

Multiple Choice Questions

Q: 1What is the meaning of CCC?

(A) Common Checking Code
(B) Computer Checking Code
(C) Common Compliance Code
(D) None of above

Q: 2What does mean TA?

(A) Task Amount
(B) Technical Audit
(C) Transport Audit
(D) None of above

7.4 LET US SUM UP

This unit gives the information regarding categories, importance, and difficulties of compliance in garment sector. The apparel industry depends heavily upon human resources, a safe environment and good working conditions are necessary for loyal workers, who ensure that production is fast, reliable and efficient. Also in this unit a student can learn about the difficulties or challenges textile and fashion brands face in adhering to compliance guidelines in their industry and how you can deal with conquer them.

7.5 KEY WORDS

Loopholes	Escape Clauses, Gap
Segregation	Discrimination, Separation
Edifying	Enlightening
Endeavors	Strives, Try, Attempt
Accreditation	Certification, License
Reprisal	Retaliation, Come back, Revenge
Coercion	Compulsion, Force
Infringement	Violations, Breaking
Viable	Effective
Awful	Unfortunate, Terrible
Impart	Communicate, Convey
Stirred	Awakened, Blend
Incredulous	Skeptical, Unbelieving, Doubtful
Consent	*Comply, Authorization, Agreement*
Inherent	*Inborn, Built-in*
Apparatus	*Tool, Equipment, Appliance*

7.8 SOME USEFUL BOOKS

- https://www.fibre2fashion.com/industry-article/5052/aepcs-common-compliance-code
- https://voiceofenvironment.com/2019/04/29/what-is-compliance-understanding-compliance-in-textile-sector/
- https://www.sgtgroup.net/textile-quality-management-blog/social-compliance-for-garment-factories-what-you-need-to-know
- https://ordnur.com/apparel/technical-audit-in-apparel-industry/
- https://www.bomler.com/blog/the-3-compliance-challenges-fashion-brands-face-and-how-to-overcome-them
- https://www.elitelabelsgroup.com/the-importance-of-ethical-compliance-in-fashion/

Answer
Question Answer
Ans: 1
Compliance means satisfying / conforming to certain standards, rule, regulation, policies, SOP's or objectives set out by association. It can to be:
National legal requirement
International legal requirement
Client / Consumer Requirement
Certification requirements
Internal Policies, procedures, rules

Ans: 2

The Social compliance provides safe factory working conditions, reduces a factory's staff turnover because the workers enjoy the company they work for which inevitably leads to higher productivity, commitment, and performance.

Ans: 3

Objectives of Garments Buyer Technical Audit is as following,

1. Ensure the QMS is effectively
2. Audit quality control system
3. Ensure compliance with customer quality standard
4. Ensure client manufacturing and process control requirement
5. Apply best prescribed procedures in garments manufacturing.
6. Ensuring effectiveness, efficiency, improvement, and customer satisfaction.

Multiple Choice Questions

Ans: 1 (C)

Ans: 2 (B)

UNIT: 8 PRE-PRODUCTION PLANNING

: STRUCTURE:

8.0 OBJECTIVES

After studying this unit, students will be able to,

- Have basic knowledge of drafting.
- Learn about drafting tools and equipment.
- Know which points to keep in mind while drafting.
- Learn the advantages and some disadvantages of drafting.

8.1 INTRODUCTION

Drafting

Drafting is defined as a method of drawing patterns on paper with mechanical precision using body measurements. A basic “block” or a foundation “pattern” can be generated through drafting. A 'block' is a

custom-fitted basic pattern from which patterns for some, different styles can be made. It consist to five basic pattern pieces or set – bodice front, bodice back, skirt front, skirt back and the sleeve. This basic block doesn't contain seam allowances, hem allowances. Design features are frequently added to a copy of this block to make variety in a design.

Since drafting employs the utilization of genuine measurements of an individual, they should be precisely recorded. Inaccuracy in measurements will lead to a faulty drafting resulting in an ill fitted garment. Additionally, a few measurements are calculated based on other measurements, for example: generally neck is taken as 1 / 12 of round bust. So measurement is a significant part of drafting.
There are three main steps in this process are:

1. Measurement
2. Pattern drawing
3. Pattern set creation

1. Measurements

The measurements are taken based on a model, which is either a human being or an approximation of one, depending upon the type of garment to be made, the measurements differ depend on which parts of the body the garment tries to cover, the type of garment it is, the gender of the person, and if they're female, the kind of body shape they have.
When taking measurements, there are some which are shared in common between men and women as body proportion and size remains the same. In any case, there are different measurements which are totally unused for men for obvious reasons, for example, the bust, the rib-cage, etc.; these are utilized specifically to cater to the female physique.
Measurements required depends on the garment that is being produced, because the more intricate or large a garment is, the more pattern pieces are needed to create it. The collection of pattern pieces together, which are utilized to create a garment are known as the pattern set.

When taking measurements

It is good to utilize something like a spreadsheet to list the measurements in the order they were taken as the "base" measurements, and then again when the measurements start to become split into quarters when the pattern is drawn.

2. Pattern drawing

When the measurements have been taken, the foundation or basic pattern is created. This starts off with a wire frame which generally outlines the length and width of the pattern piece, and then is gradually developed into one of the pieces of the pattern set.

This process should be done either by the utilization of manual or electronic pattern making tools. When performed manually, the pattern is

transcribed onto pattern paper, and then at the last, pinned to pattern. At the point when performed utilizing electronic means, for example, by Fashion Computer Aided Design (Fashion CAD), the pattern set is designed and then printed onto paper, cut and pinned onto fabric.

3. **Pattern set creation**

With manual pattern making, the pattern set is generally not developed in a "block" method; individual parts are drawn onto pattern paper one by one, and afterward assembled onto the material from which the patterns are being cut. Utilizing electronic methods generally starts from the dimensions of the material which is being cut as the size of the CAD document being developed.

In a non-industrial setting, the pattern would still be developed within CAD and printed to paper; however it would be physically set onto material, pinned, and then cut.

In industrial settings, individual layers of fabric are not cut with scissors, but instead, a few hundred layers are laid on top of each-other and made rigid, and then a computer aided cutter follows the pattern preset via CAD and goes before to cut out shapes from the material without the requirement of printed pattern.

8.2 INSTRUCTION FOR DRAFTING

To learn drafting it is important for beginners to practice the diagram on a board covered with Melton cloth, or a paper. Some equipments are required for drafting.

- **Basic Drafting Tools and Equipment**

Well and appropriate selected pattern drafting tools and equipments are essential for pattern drafting. Especially it is necessary to have a box or kit for keeping the drafting tools.

The drafting tools and equipment are as per following:

1. **Measure Tape:**
   Smooth measuring tape is required which is set marked with increments of inches and centimeters on its sides.
2. **Scissors:**
   They are utilized for cutting out pattern pieces. Small to medium sized scissors are required.
3. **Square:**
   It is an L-molded metal ruler; the long arm measures 24 inches and the short arm 14 inches. It has a perfect right angle corner. It is utilized to draw lines at right angles during drafting.
4. **Tracing Wheel:**
   It is used to transfer pattern making into paper and fabric.
5. **Carbon Paper:**
   It is utilized to transfer pattern markings.

6. **Brown Paper:**
   Brown paper is used for drafting out pattern pieces.
7. **Cardboard Paper:**
   It is utilized for drafting out the patterns, particularly the basic blocks or master patterns.
8. **Pencils:**
   It is utilized to draw out lines during drafting.
9. **Drawing Pins or thumb tack:**
   It is utilized for pining / holding brown paper or cardboard paper on the table during drafting.
10. **French Curve:**
    It is utilized for drawing curve line during drafting the neck line, armhole, skirt side seam.
11. **Long and Short Rulers:**
    They are utilized for drawing straight lines.
12. **Eraser:**
    It is utilized in cleaning wrong pencil marks on the drafting paper.
13. **Cello Tape:**
    It is utilized in joining drafting papers.
14. **Paper Gum:**
    It is utilized in joining drafting paper.
15. **T-square:**
    It is utilized in drawing right angles.

- **Points to remember while taking body measurements:**

1. It is essential to use a good quality and standard measuring tape.
2. Round estimations should not be taken tightly or too slackly.
3. Outer garments, for example, a coat or a cardigan are to be removed while taking measurements.
4. The posture of a person should be erect while taking measurements.

After taking the correct measurements, drafting must be finished with mathematic exactness. This draft can be made on a paper or on the wrong side of the fabric. For beginners it is better to prepare the draft on a paper to avoid the risk of spoiling the fabric.

- **General Considerations for Drafting**

1. Use smoother fabric or paper for drafting.
2. Drafting should be done on the wrong side of the material with the help of a tailor's chalk.
3. It should be done on a flat surface.
4. Calculate the size of the paper accurately as per the requirements of the drafting/garment.
5. Always keep the fold of paper on left hand side if drafting is to be done on folded paper.
6. Well sharpened pencil should be used for accuracy of lines.
7. Use tailor's square to draw right angels.
8. Distinguish back and front with different types of lines.
9. Draw lines perfectly and make smooth curves using French curve.

Benefits of Drafting:

- A correct drafting gives a good fit.
- A basic block can be graded to any desired size pattern.
- Different designs can be made with a simple basic draft.
- Drafting method is time saving method, we can store draft and we can use it many times. Especially in bulk production.
- Accuracy in cutting can be achieved when a draft is available.
- The wastage of fabric can be avoided as all pieces of draft can be laid on the material and adjusted before cutting.

In case of any figure irregularities, alterations can be made on a copy of the paper draft before finally cutting the fabric. E.g. - broad shoulder, drooping shoulder etc.

Negative points of Drafting:

- A basic draft has no seam allowance but only ease. Seam allowances are to be marked on the fabric.
- Does not fit all, as the slope is made according to individual body measurements

8.3 KNOWLEDGE OF DRAFTING OF BASIC BODIES

In this unit we will learn the drafting of basic bodies block step by step.

Back

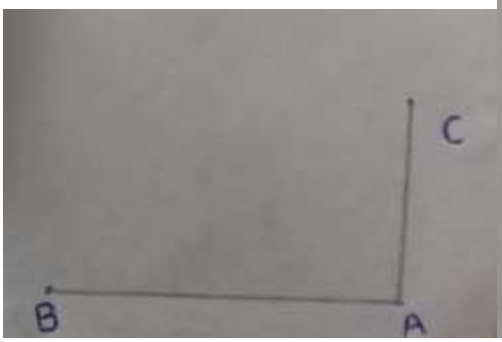


Figure: 1 , Diagram: 1

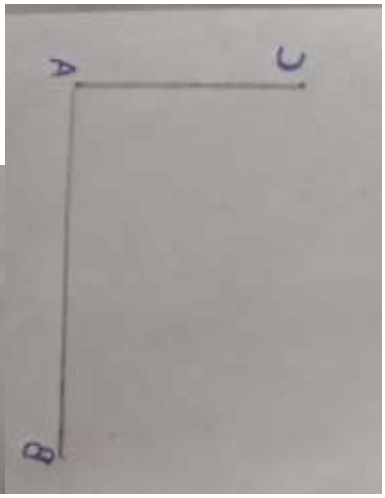


Figure: 2 , Diagram :2

Diagram 1 and 2:- Diagram 1 shows how to draw square lines from A with the help of a square. After removing the square, the square lines will look like diagram 2, forming an angle of 90 degrees.

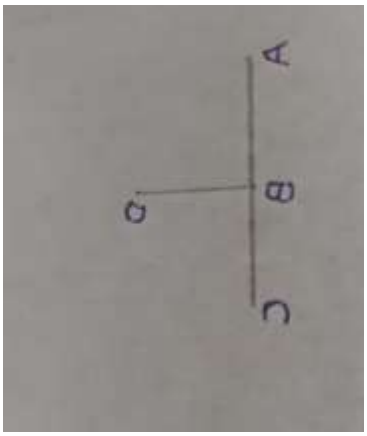
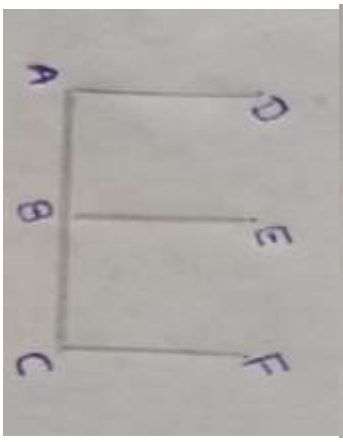


Figure: 3 Diagram: 3

Diagram 3:- In this diagram a square line is drawn from B.



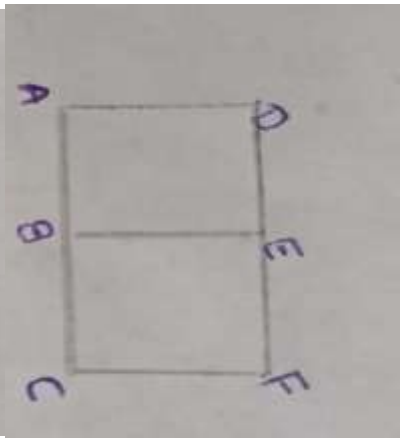


Figure: 4, Diagram: 4 **Figure:5, Diagram:5**

Diagram 4 and 5:- In diagram 4 and 5, square lines are drawn from points A, B and C. As the lines D-E-F is squared out from D, distance A-D, B-E and C-F are equal.

Measurement:

Chest: 26 inch

Waist length: 12 inch

Shoulder: 5 inch

Drafting method

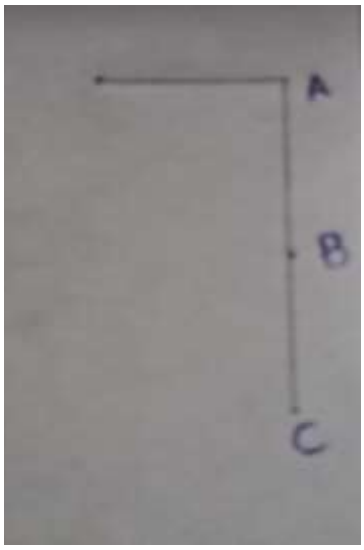


Figure: 6, Diagram: 6

Diagram 6:-

Shoulder lines from A: -These lines to be drawn same as shown in diagram 1(by using square).

A-B =1 / 4th chest: -1 / 4th of the chest = 6.5 inch. So measure 6.5 inch from point A and mark it as point B.

A-C = Waist length: - The measurement of waist length is 12 inch. Measure this distance from A and mark as C.

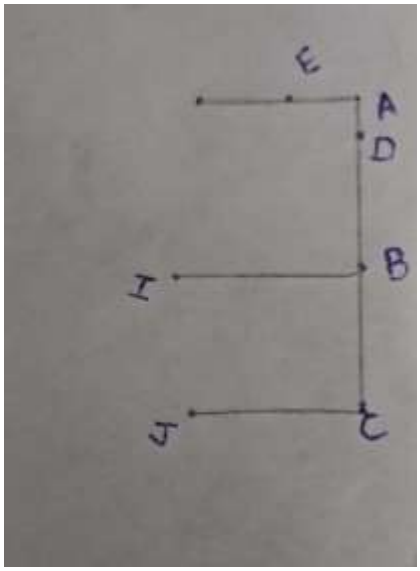


Figure: 7, Diagram: 7

Diagram 7:-

Square out from B and C: - The line B-I and C-J are drawn from B and C, by using a square.

A-D = ¾ inch: -Measure ¾ inch from A and mark it as D.

A-E = 1/12th chest: -1/12thchest is 2.1 inch. Measure this distance from A and mark it as E.

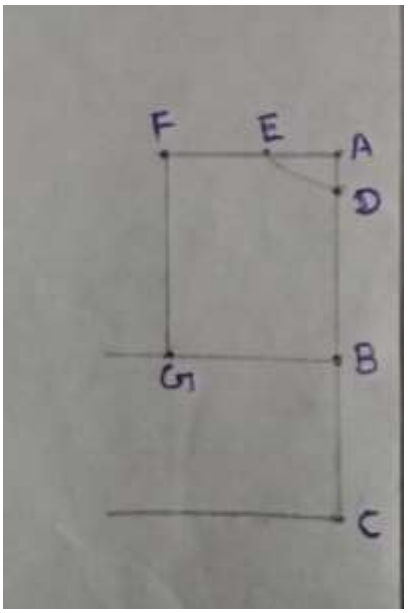


Figure: 8, Diagram: 8

Diagram 8:-

Neckline shape D-E: -Starting from point D, draw a curve to E. This shape comes at the back of neck.

A-F = Shoulder +1 / 4th inch: - Add ¼ inch to the shoulder measure of 5 inch. Now measure this distance of 5 1 / 4th inch from A, and mark it as F.

Square down from F to G: -keep the angle of the square at F and draw line F-G.

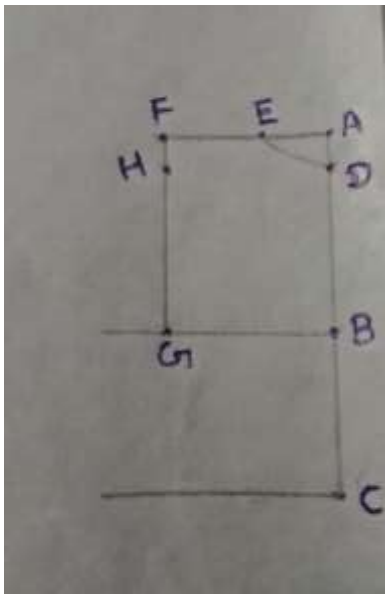


Figure: 9, Diagram: 9

Diagram 9:-

F-H = 3/4thinch: - Measure 3 / 4th inch from 5 and mark it as H.

Diagram 10:-

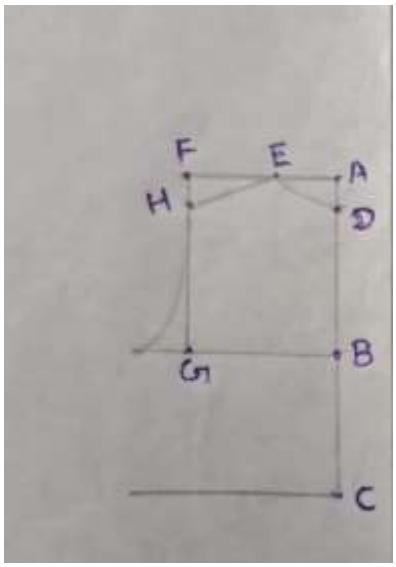


Figure: 10, Diagram: 10

Join Shoulder E-H: - With the help of a square, draw a straight line from E to H.

B-I = 1/4th chest + 1 ½ inch: - Measure this distance of 6.5inch +1 ½ inch = 8inch from 1 - 8 and mark it as 8.

Shape scye H-I: - Draw the shape of scye from H to I as shown.

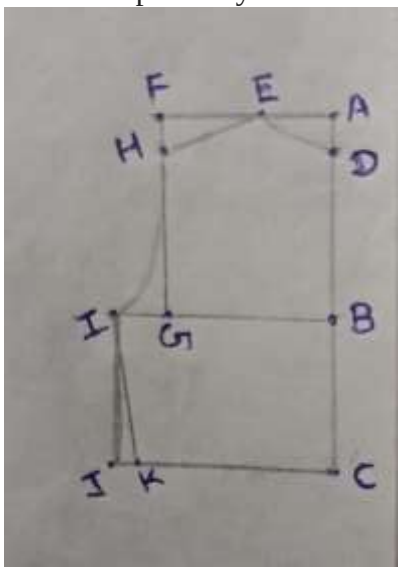


Figure: 11, Diagram: 11

Diagram 11:-

Square down from I to J: - draw this line in the same way as F to G.

J– K: - ½ inch. Join I – J: -Measure ½ inch from J to K, and then join I to K.

Note: This is the complete diagram of the back. In this way all the diagrams should be drafted.

8.4 KNOWLEDGE OF DRAFTING OF SKIRT

- **Construction of A – Line Skirt**

Measurements

Length: 20”
Waist: 26”
Seat: 36
Belt width: 1 ½ “

INSTRUCTION FOR DRAFTING

Front

Square line from A, fold at A-B.
A-B = ¾ inch = 0.75 inch.
B-C = 7 inch for Seat line.
B-D = Length less Belt width + ¼ inch = 18.75 inch.
A-E = ¼ Seat less 1 ½ inch = 7.5 inch.
F is located at 7 inch from E and ¼ seat less ½ inch from C.
Join E - F and produce G.
E –G = D-B + ½ inch = 18.75 inch + ½ inch = 19.25 inch.
Shape D-G.
B-H = ¼ Waist + ½ inch = 7 inch.
Shape H-F, B-H as shown.

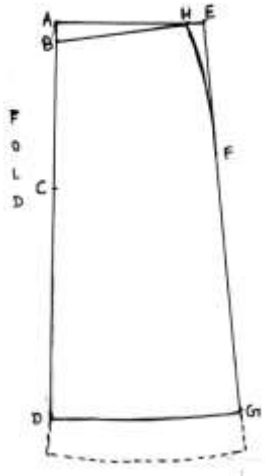


Figure: 12, Diagram of A – line skirt Front Part

Back

Square line from A, fold at A – D.
A-B = ¾ inch = 0.75.
B-C = 7 inch for 5 seat line.
B-D = Length; less Belt width + ¼ inch = 18.75 inch.
A-E = ¼ Seat + ½ inch = 9.5 inch, Either 5 cm more than A-E of Front.
F is located 7 inch From E and ¼ seat plus 1 ½ inch from C.
Join E –F and produce G.

E-G= B-D + ½ inch.
Shape D-G.
B-H = Same as B-H of front + 2 inch = 9 inch.
Shape H-F.
B-I = ¼ Waist + ½ inch = 7 inch.
Divide B-H in 3 equal parts B-J, J-K, K-H.
Take darts at J and K keeping the width equal to half of I and H and the length up to 4 inch.
Keep 2 inch below G-D of front and back for interns

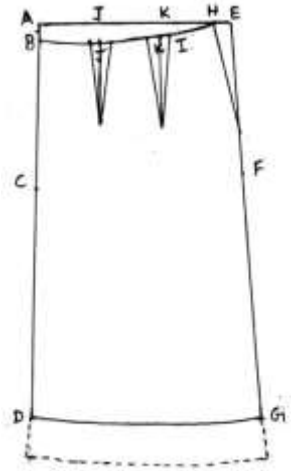


Figure: 13, Diagram of A – line skirt Back part

Belt

Belt is made from canvas (interfacing). Cut canvas in single piece as follows, While cutting fabric for belt ¼ inch extra fabric for seam allowance.

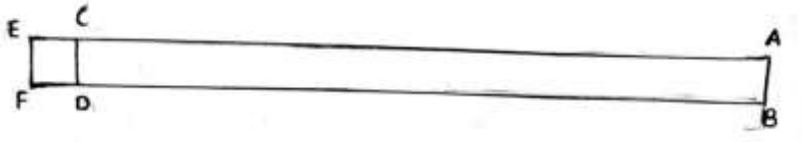


Figure: 14, Diagram of belt

Square line from A.
A-B = 1 ½ inch.
A-C = and B-D = Same as Waist.
Keep E to F 2 inch extra at C-D.

8.5 KNOWLEDGE OF DRAFTING OF SHIRT

Half open shirt
Measurements:
Full length: 28”
Chest: 32”
Neck 14”

Shoulder: 8”
Full Sleeve: 23”
Cuff length: ¼th chest + ½ inch
Cuff width: 1/6th chest + ½ inch

Instruction for drafting
Front

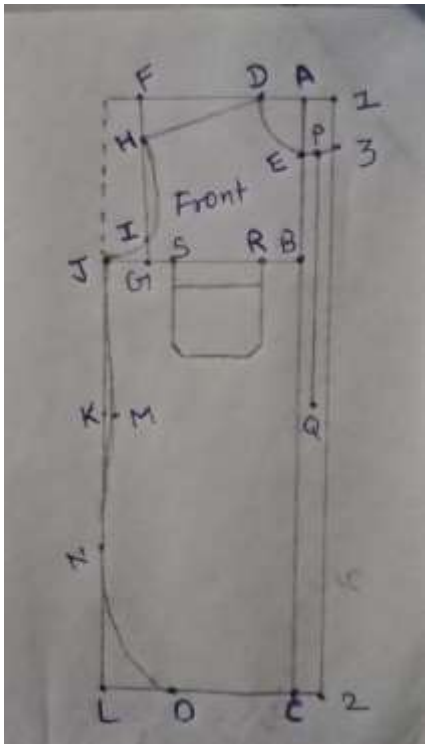


Figure:15, Diagram of Front part of shirt

Draw line A-B-C at a distance of 1 ½ inch from the fold 1-2
A-B: -1/4th chest
A-C: -Full length + 1 inch
A-D: - 1/6th neck
A-E: - 1/6th neck +1/4th inch
Shape neck E-D as shown.
A-B: - Shoulder + 1/4th inch
G-B: - 1/4th chest
Join 5 - 6
H-F: -1/4thof F to G.
Join shoulder D-H.
I-G: -about 1 1/4th inch.
J-B: -1/4th chest + 2 inch
Shape scye H-I-J
Square down from J to K and L.
J-K: -about 1/4th chest.
M-K: -½ inch
N is midway K to L.
O - L: -about 1/8thchest.

Shape J-M-N-O as shown.
P-O: -½ inch.
Q-P (parallel of B-A):-1/4thchest + 4 inch.
Cut the lower layer from 15 to 16 of the right side. The left side should be wider than the right side.
3-1: -Same as C to A.
Join E-3.
Pocket:-
R-B:- about 2 inch.
S-R: - 1/8th chest or S to R + ½ inch, width.
Height: - Same as S to R+ ½ inch.
Mark pocket as shown.

Back

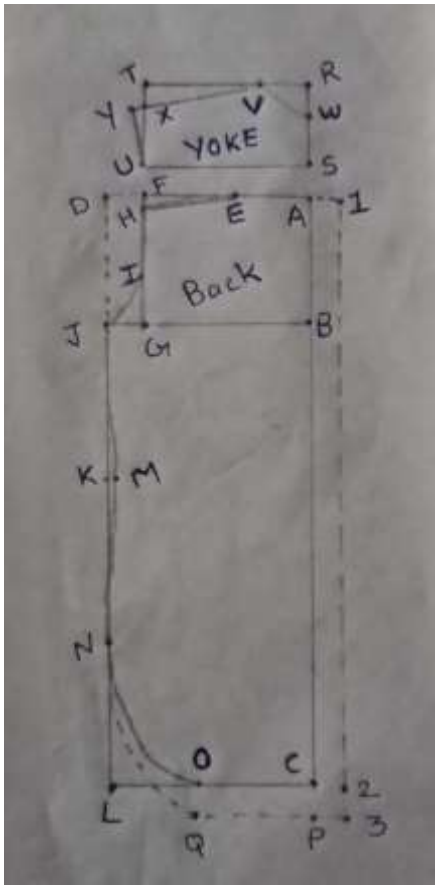


Figure: 16, Diagram of Back part of shirt

Cut the front and use it for back in such a way that lines B-C and A-J of front and back will coincide.
Square lines from A, fold at A-C.
B-A: -Same as B to A of front less 1 ½ inch.
C-B: -Same as C to B of front.
Square out from A, B and C.
B-A: - Same as F to A of front.
H-F: - ½ inch.

E is midway F to A.
Shape H-E as shown.
Except I, the proportions of J to B are the same like front.
Shape scye H-I-J.
Collar

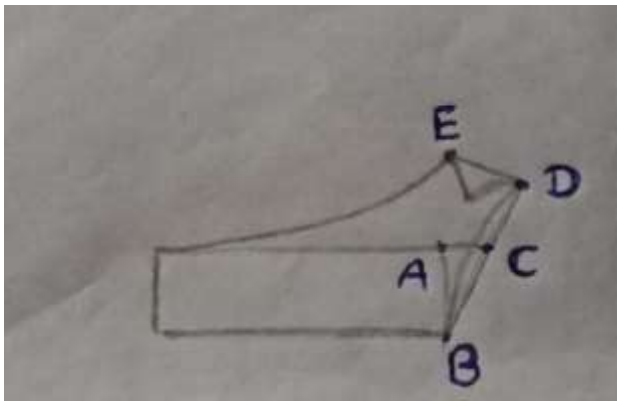


Figure: 17, Diagram of collar

Draw line A-B-C (from the edge 1-2) at distance of 2 inch.
1 ½ inch for interns and ½ inch for bottom stand.
Full sleeve with single cuff

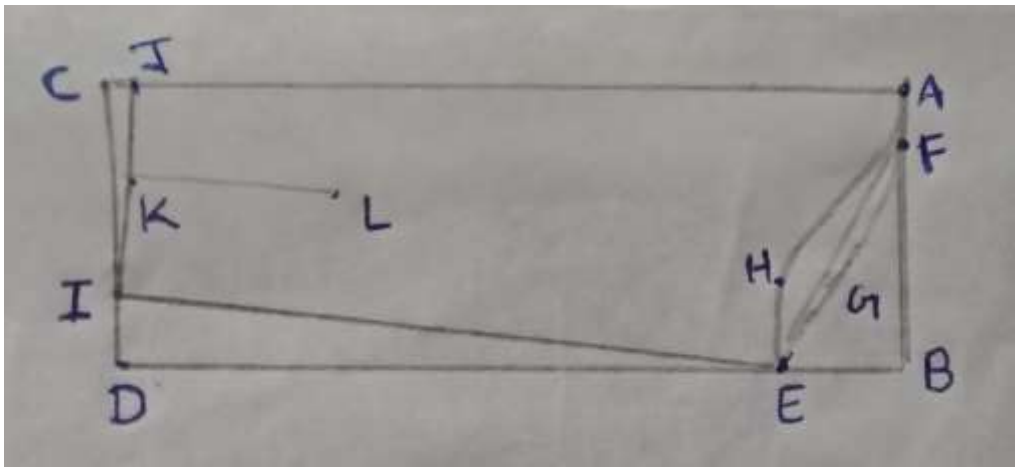


Figure: 18, Diagram of full sleeve

A-C: -sleeve length from shoulder - cuff width + 1 inch.
I-C: -half cuff length + 1 ½ inch for pleats and seams.
J-C: -½ inch.
Join I - J.
K-I: -half of I to J + ½ inch.
K-L: -1/6th chest, cuff opening.
Cuff:

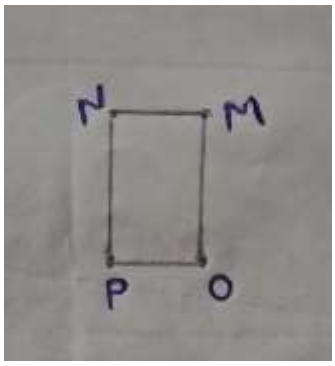


Figure: 19, Diagram of cuff

Square line from M, fold at N-M.
N-M: - Cuff width + ½ inch
O-M: -Half cuff length + ¼ th inch
P- N: -Same as O-M or less ¼ th inch.
Join O-P.

Check Your Progress
Question – Answers

Q: 1What is drafting?

_____
_____
_____
_____
_____
_____

Q: 2Give the name of basic drafting tools and equipment.

_____
_____
_____
_____
_____
_____

Q: 3What are the benefits of drafting?

_____
_____
_____
_____
_____
_____
_____

Q: 4Which points should be considered for drafting?

_____
_____
_____

_____
_____
_____
_____

Multiple Choice Questions

Q: 1Which tool is used to transfer markings from paper pattern to fabric?

(A) Long and short rulers
(B) French curve
(C) Tracing wheel
(D) All of above

Q: 2Which tool is used to draw curved lines of armhole?

(A) French curve
(B) Measure tap
(C) Tracing wheel
(D) None of above

Q: 3The technique to reduce or enlarge a given size pattern is called _____.

(A) Draping
(B) Grading
(C) Marking
(D) None of above

8.6 Let Us Sum Up

Drafting is a very essential part of pattern making process in garment construction. And it requires tremendous skills and practice. This topic gives us basic knowledge about drafting. Providing information regarding criteria should be kept in mind while drafting, along with its advantages and some negative points so that students can easily understand about basic drafting. And one can make their own basic bodies block after learning this chapter.

8.7 KEY WORDS

Cater – Gratify, Pamper
Scye – an arm hole or occasionally a leg hole
Intricate – Elaborate, Compatible

8.8 SOME USEFUL BOOKS

- http://ecoursesonline.iasri.res.in/mod/page/view.php?id=121205
- https://tailor.fandom.com/wiki/Drafting
- https://tipsinfluencer.com.ng/basic-pattern-drafting-techniques-and-fashion-designing-advantages-tools-and-equipment/

- http://ecoursesonline.iasri.res.in/mod/page/view.php?id=121205
- **Zarapkar K, (2007,"Zarapkar System of Cutting", Published by: Navneet Publication India Ltd., Dantali Gujarat.)**

Answer
Question – Answers

Ans: 1
Drafting is defined as a method of drawing patterns on paper with mechanical precision using body measurements.
Ans: 2
The drafting tools and equipment are as per following:

Measure Tape, Scissors, Square, Tracing Wheel, Carbon Paper, Brown Paper, Cardboard Paper, Pencils, Drawing Pins or thumb tack, French curve, Long and Short Rulers,
.Eraser, Cello Tape, Paper Gum, T-square

Ans: 3
Benefits of Drafting are mansion below:

- A correct drafting gives a good fit.
- A basic block can be graded to any desired size pattern.
- Different designs can be made with a simple basic draft.
- Drafting method is time saving method, we can store draft and we can use it many times. Especially in bulk production.
- Accuracy in cutting can be achieved when a draft is available.
- The wastage of fabric can be avoided as all pieces of draft can be laid on the material and adjusted before cutting.

Ans: 4
General Considerations for Drafting
1. Drafting should be done on a flat surface.
2. Drafting should be done on the wrong side of the material with the help of a tailor's chalk.
3. Use smoother fabric or paper for drafting.
4. Calculate the size of the paper accurately as per the requirements of the drafting/garment.
5. Always keep the fold of paper on left hand side if drafting is to be done on folded paper.
6. Well sharpened pencil should be used for accuracy of lines.
7. Use tailor's square to draw right angels.
8. Distinguish back and front with different types of lines.
9. Draw lines perfectly and make smooth curves using French curve.

Multiple Choice Questions
Ans: 1 (C)
Ans: 2 (A)
Ans: 3 (B)

UNIT: 9 GLOBAL SUPPLY CHAIN

: STRUCTURE:

9.0 OBJECTIVES

After studying this unit, students will be able to,

- Learn about different areas of Global Supply Chain which are marketing, logistics, and supply chain management.
- Have a basic knowledge regarding business abilities that are important to operate a global supply chain.
- Risk factors affecting on global supply chain management.

- International regulations and role of government and united nation for global supply chain.

9.1 INTRODUCTION

In commerce, global supply chain management is characterized as the distribution of goods and services all through a trans-national organizations' worldwide network to maximize profit and minimize waste. Essentially, global supply chain management is similar to supply chain management, however it focuses around organizations and associations that are trans-national.

Global supply chain management has six fundamental areas of focus: Logistics management, Competitor orientation, Client orientation, Supply chain coordination, Supply management, and Operation management. These six areas of concentration can be partitioned into four primary zones: Marketing, Logistics, Supply Management, and Operation management. Successful administration of global supply chain likewise requires following different global guidelines set by an assortment of non-government organization (for example The United Nations).

Global supply chain management can be affected by a few elements who force policies that manage certain parts of supply chains. Governmental and Non- governmental associations plays an important role in the field as they make and authorize laws or regulations which organizations should withstand by. These administrative strategies regularly manage social issues that relate to the execution and activity of a worldwide supply chain (for example labour, environmental, and so forth) These administrative strategies force organizations to obey to the guidelines set up which often sway an organization's profit.

Working and managing a global supply chain comes with a few risks. These dangers can be divided into two fundamental categories: Supply-side risk and Demand side risk. Supply-side risk is a category that incorporates risk accompanied by the availability of raw materials which impacts the ability of the organization to fulfill customer demands. Demand-side risk is a category that incorporates risk that relate to the availability of the finished product. Depending on the supply chain, a manager may choose to minimize or take on these risks.
Here, are some examples of global supply chain: Amazon, McDonald's, Intel, Zara, Cisco, and The Coca –Cola.

9.1 ARES OF CONCENTRATION

9.2.1 Marketing

Marketing ought to be emphasized by global supply chain managers to create client value, satisfaction, and loyalty. Lead to improved profit margins, which thusly turns in general corporate growth. Managers need to consider their strategies and the implication of the strategy on the entire supply chain. One market strategy that is normally utilized among organizations with global supply chains is the client point of view strategy.

Taking a customer point of view towards marketing strategy implies focusing on mainly on clients. This perspectives focus on understanding the intricacyof client esteems. This point of view includes understanding and how a client defines and builds up their values. By understanding how a client sets their values, an organization can make changes to appeal to the customer base's values which in turn yields more prominent profit.

There are four common and basic difficulties that managers face when endeavoring to plan and carry out a marketing strategy that best identifies with client esteems. The main issue that managers face is the challenge of understanding precisely what is the client's esteem in a global supply chain. Understanding client esteems in a global supply chain focuses on the errand of distinguishing what supply streams customer value most.

The subsequent challenge is understanding the constant changes in customer esteems all through global supply chains. Since customers are continually changing what they value, remaining in front of the pattern and attempting to predict changing values is progressively difficult.
The third challenge is having to deliver values in another environment that has never seen this level of marketplace. The worldwide market is becoming progressively pervasive which organizations are taking advantage of, hence the challenge of endeavoring to deliver values in a country / region that has never been presented to a marketplace like this before emerges**.**

The last challenge is creating and remaining focused on the solutions intended to address these issues. Solutions to these difficulties are implemented and it is a challenge within itself to adhere to these solutions particularly as organizations have increased emphasis on cost reduction efforts.

9.2.2 Logistics

While managing a global supply chain, it is imperative to place emphasis on logistics performance as there has been an increase in

business-to-business worldwide marketing. Logistics is inherently difficult and complex for a global supply chain as it deals with export regulations, delivering distances, and cross-currency issues. Organizations and associations who place an accentuation on logistics management can find themselves with a serious competitive benefit as it noticeably affects customers.

Focusing on client inclinations while implementing and dealing with an organizations logistic services has demonstrated to provide the association a several advantages. One of the significant advantages is cost reduction. Cost can be decreased if the organization identifies every one of the essential strategic portions and, then eliminates unnecessary and redundant. Customizing logistics not only reducing cost likewise increases revenue by appealing to the client base which in turn remains faithful to the business.

To remain competitive, organizations need to develop global logistic strategies that appropriately and successfully appeal to the client's needs. By doing this, organizations can be able to take advantage of the productive global market**.**

9.2.3 Supply management

Supply management manages the development and management of the critical business and supplier relationship. As the market becomes progressive worldwide, the strategy of out-sourcing suppliers also gets progressively utilized. Out-sourcing suppliers has a few advantages for a business if they can successfully build up the relationship. The key aspects of supply chain management are Sourcing, Planning, and Logistics.

9.2.3.1 Apparel Supply chain

The Textile and Apparel Supply Chain contains different raw material areas, ginning facilities, spinning and extrusion process, processing sector, weaving and knitting production lines and clothing (and other stitched and non-stitched) manufacturing that supply an extensive distribution channel. This supply chain is maybe quite possibly the most diverse in terms of the raw materials utilized, technologies deployed and items produced.

This supply chain supplies around 70% by worth of its production to the homegrown (domestic) market. The distribution channel involves wholesalers, merchants and large number of small retailers selling articles of clothing and textiles. It is only recently that large retail organizes are emerging in this way expanding variety as well volume on display at a single location. Another element of the distribution channel is the strong presence of 'agents' who get and combine orders for makers. Exports are traditionally executed through export houses or procurement / commissioning workplaces of large global apparel retailers.

It is estimated that there exists 65,000 clothing units in the organized sector, of which around 88% are for woven cloth while the leftover are for knits. In any case, just 30 - 40 units are large in size (because of long periods of reservation of non-trading clothing units for the small scale sectors – a guideline that was removed recently). While these organizations are spread everywhere on the country, there are clusters emerging in the National Capital Region (NCR), Mumbai, Bangalore, Coimbatore, and Ludhiana employing about 3.5 MN people.
Meaning of supply chain management as evolved and used by The Global Supply Chain Forum (3): Supply Chain Management is the coordination of key business processes from end user to original suppliers that gives products, services, and information that add a value for clients and other partners.

The above definition is reflected in the design of a typical apparel supply. As obvious, the whole clothing supply chain comprises of each association starting from initial fiber supplier to customer buying clothing items for final consumption. Every association contains different functional domains, as manufacturing, planning, and marketing and so on. Powerful supply chain oversees flow of demand and supply, which are moving in the opposite direction to each other, in an effective path at every node of supply chain.

9.2 MANAGEMENT THEORIES

9.3.1 The 21st – century logistics framework

The 21st-century logistics system is a global supply chain management theory that was developed at Michigan State University and was acquainted with the business world in 1999. The structure distinguishes six business abilities that are important to operate a global supply chain.

There are various fundamental capacities for each competency which impact the management decisions. The six abilities are: Customer integration, internal integration, Material / service supplier integration, Technology and Planning integration, Measurement integration, and Relationship integration.

The capacities that have appended the competency of customer integration are: Segmental focus, Relevancy, Responsiveness, and Flexibility. Segmental focus alludes to the ability to develop customer aimed projects that are specifically intended to achieve maximum client success. Importance alludes to the capacity to maintain and modify customer focuses to reflect the constant changing expectations. Responsiveness alludes to the ability to accommodate unique and

unexpected client demands/prerequisites. Flexibility alludes to the ability to properly adapt to any sudden circumstance.

Cross-functional unification, standardization, simplification, and consistence are the hidden abilities that are related with the internal integration competency. Cross-functional unification alludes to the ability to place possible co-operative activities into manageable operational process. Standardization alludes to the ability to implement policies / methods that address any simultaneous tasks. Simplification alludes to the ability to recognize, adopt, implement, and improve the most ideal strategic approaches. Compliance alludes to the ability to follow any settled strategies.

The capacities that are related with material / service supplier incorporation are: Strategic arrangement, Operational fusion, financial linkage, and Supplier management. The ability to develop a corporate culture or common vision that make a shared duty is characterized as strategic alignment. The ability to fuse system together to decrease redundancy is characterized as operational fusion. Monetary linkage alludes to ability to join financial ventures together with supplier to accomplish common goals. Supplier management alludes to the ability to extend management to incorporate the progressive structure of supplier.

Information management, internal correspondence, connectivity, and forecasting and planning are the capacities that are encompassed by technology and allocate resources. The capacity to utilize seamless transactions across the whole chain to allocate assets all through the chain is called information management. Internal correspondence alludes to the ability to communicate within the business in proper way. The ability to communicate and exchange information between the business and the external supply chain partner is called connectivity. Collaborative forecasting and planning alludes to the capacity to team up with clients to recognize and develop shared visions.

The capacities that underlie measurement integration are: Functional assessment, comprehensive metrics, and monetary impact. Functional assessment alludes to the ability to create and implement a proper performance measurement tool. Complete measurements allude to the ability to implement cross-business performance standards. Monetary impact alludes to the direct link between overall supply chain performance and the consequences of the financial measurement.

The capacities that underlie relationship integration are: role specification, rules, information sharing, and gain / risk sharing. Role specificity alludes to the ability to clearly characterize leadership and set up a bunch of shared and individual obligations. Rules alludes to the ability to make and implement policies / rules that govern regular connections. Information sharing alludes to the ability to share significant

information (often including monetary, technical, or strategic data) all through the supply chain. Gain / risk sharing alludes to suitably divide and allot rewards / penalties.

The 21st-century logistics system allows managers to distinguish and implement the most important hidden capacities that are incorporated in the six business capabilities. The structure gives managers the opportunity to choose what they accept to be the main abilities that should be carried out to run a successful global supply chain.

9.3.2 Human collaboration theory

The human collaboration theory recommends that there is strong proof to demonstrate that investment in supply chain management has the largest impacts when focused around empowering supply chain collaboration. This administration theory focuses on the manager's ability to invest in and promote human collaboration between workers all through the global supply chain.

Human collaboration is defined as the utilization of skills through harmonization of people, groups and associations to accomplish more prominent things not feasible by an individual person. The human collaboration theory / structure spreads out four key parts. The principal part manages the forces that drive change, the second focuses on people technology process assets that make network collaboration effort, the third deal with resisting forces which encourage individuals to resist collaboration, and the fourth segment looks at the ideal collaboration performance. The theory expresses that to execute and operate a successful global supply chain, a manager should understand and use these components.

The theory states that to execute and operate the best collaboration system, a supervisor must; build trust between different players of the chain (supplier and manufacturer), build up a culture which supports decision making and work, implement an appropriate award system, and utilize synergistic activities.

As per the theory makers, a manager must follow 4 steps to change their network into a more collaborative network. The initial step is to recognize that to be competitive the organization will require innovations which can be proposed by individuals outside the corporate boundary and in this manner to get to these individuals they should be more collaborative with external partners. They at that point should alter their perspectives on accomplishing collaboratively by recognizing the different kinds of collaboration (value-based, co-operative, coordinated, and synchronized). Then, a manager should develop a cooperative plan that accomplishes the goals he / she decides to accomplish. Finally a manager should develop the right controls to guarantee the goals / mission can be met. If a manager follows the proposals made by this theory, they

will have implemented a proper global supply chain that focuses on human collaboration which in turn will yield better outcomes.

9.4 INTERNATIONAL REGULATIONS

9.4.1 Role of Government

Governments can play a large role in controlling certain parts of a global supply chains. Governments have a wide range of strategy instruments that they can use to implement rules. These instruments incorporate yet are not limited to: taxation, financial incentives, regulation, liberalization, infrastructure, land use planning, and counsel and appeal. However, prior to planning and advice a regulation, it is significant for governments to appropriately analyze any second-order impacts that may happen. Second order effects are defined as the offsetting effects that happen somewhere else as a result of the implementation of a policy.

Recently, there has been a steady slope of governments making and implementing guidelines to promote green supply chains & to design and implement the proper government's need to consider the five aspects of reasonable logistics. The first is reducing freight transport power as it is getting necessary for governments to introduce explicit policies to encourage organizations to decrease the amount of freight development within their system. The subsequent aspect is freight modular split, which the author describes as moving freight to greener transport modes. Governments can promote this by utilizing strategy instruments (normally tax assessment, financial incentives, regulation, and infrastructural measures).

The third angle is vehicle use which governments should attempt to promote organizations to improve their utilization of street cargo. This should be done through tax collection, regulation, liberalization, and advice committees. The fourth aspect is increasing energy efficiency which frequently is seen with the presentation of general efficiency programs. Governments can raise fuel obligation, sponsor driver training plans, reduce and enforce speed limits, force fuel economy standard, incentivize scrap page of old vehicles and offer guidance to promote a better quality of energy proficiency. The fifth and last aspect is cutting emissions relative to energy use which should be tended to through a policy

9.4.2 Role of United Nations

The United Nations plays a major role in planning and implementing international guidelines that have huge impact on the activity and the management of global supply chains. The United Nations created the UN Global Compact which is an association that aims to prepare a worldwide development of sustainable organizations and stakeholders.

The UN Global Compact attempts to prepare a worldwide development by supporting organizations to be responsible and to progress social goals. The association has created a set of ten principles which they expect companies to abide by. The ten principles fall under the more broad categories of human rights, labour, environment and anti-corruption.

With regards to human rights the association urges organizations to help and respect human rights, and ensure they are not abusing any settled human rights laws. The labour standards manage the acknowledgment of collective bargaining, elimination of forced labour, abolition of child labour, and elimination ofdiscrimination.

The environment principles focus on being wary to environmental difficulties, promoting greater environmental duty, and empowering the improvement of environmentally friendly technologies. The anti-corruption guideline states that organizations should work against corruption. They have published two aides which represent how businesses can implement the ten principles all through their supply chains and incorporate manageability. These aides express that organizations can accomplish supply chain sustainability by taking certain steps which include: committing, defining, implementing, assessing, measuring, and communicating to successfully get feasible**.**

9.5 RISK OF OPERATION

9.5.1 Supply side-risk

Supply-side risk is a category that incorporates risks accompanied by the availability of raw materials which effect the ability of the organization to fulfill client demands. Several issues can arise from operating a global supply chain. Common supply side risks are regularly the way that it takes a long time to receive products from around the world, and suppliers may not really operate to the same quality standards. Outsourcing suppliers may give a business a few advantages yet a lot of risk comes attached to it. One major risk is the fact that global currencies are continually changing, a small change in foreign currency could have a large impact on the general benefit a business receive. Supplier order processing time inconstancy is another supply side risk that comes increasingly risky while outsourcing suppliers. This risk is characterized by the fact that the time it takes a supplier to fulfill an order can change for each order. Businesses are not actually sure how the supplier will manage the order and whether they will actually want to deliver products on time.

9.5.2 Demand side-risk

Demand side risk is a category that incorporates risks that relate to the availability of the finished product. Demand-side risk mainly happens when organizations can't manage the customer base demands. This can happen when customer demand is higher than supply, and the company needs more stock to appropriately manage the customer demand. Since

customer demand changes often; much of the time it is tough for managers to figure what is required for the following month which creates the risk of running stock.

9.6 ADVANTAGES OF GLOBAL SUPPLY CHAIN

Instead of poorly organized supply chain a global supply chain is amazingly competitive thus you can get a great cost for suppliers that will all be produced to excellent guidelines, without even having to search widely. Excellent product completed to the best standard of quality controls can sourced rapidly and effectively.

A global supply chain thus brings with it benefits regarding organizations who are associated with a global supply chain having the option to shave their costs right down and in this manner guarantee the financial suitability of their business. Global supply chains are often one of the principal techniques utilized for Supply chain cost reduction activities

The global supply chain implies that business within nations which generally didn't operate to exclusive requirements have needed to 'up their game'. Organizations that operate within developing nations or those like India and China, realize that if they don't come up with the products, there are a bunch of different businesses that will. This means that there is a real incentive to get things right, first time and constantly!

If you have sufficient contacts and suppliers globally, you can truly reduce the amount of stock that you need to hold, which means that you will save costs as far as storage / robberies/shipping merchandise and so on. These expenses can add up, so this surely helps sharpen the competitive edge that comes with a global supply chain.

The global supply chain additionally makes the securing of almost any item simple, since somewhere in the world it is likely being produced or manufactured. Historically any product that was not a standard thing, from a standard range could take ages to produce. Presently it can just be purchased from the country where it has been made.

The global supply chain truly works on every minute of every day, just because of the time differences in different nations. So there is a logic that the chain never sleeps, it is constantly in a hurry and people are working to meet the supply chain requirements on various continents and at different times.

Operating a global supply chain also carries with it new opportunities for the business sectors. Assuming you are sourcing items from China, it is practical that you may wish to look at different markets

that you might have the option to tap in to since you have effectively settled sources in China.

Perhaps the most interesting factor of the global supply chain is that we can learn from others! Business is done any other way in different parts of the world and we can learn better approaches for working together, new production methods and new distribution techniques, if we keep an open mind and have a willingness to learn.

A global supply chain must be flexible or it will essentially implode, yet given that any supply chain has to be flexible, with a global supply chain the flexibility is always given a higher need and all things considered, flexibility within the chain is maximized, allowing for the chain to be just about as compelling as could be expected.

The last advantage of a global supply chain is that if you are within this type of structure, you have an opportunity of success and having the option to try and develop during the financial decline. If you are not part of it, your chances of survival are lower. So being in it is practically not a choice and the advantage (of survival) is a difficult thistle to grasp, yet if your organization isn't operating within a global supply chain system, you are well behind the individuals who are!

Check Your Progress

Question answer

Q: 1What is global supply chain?

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_____

Q: 2What are the key aspects of supply chain management?

_____
_____
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_____
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_____

Q: 3What are the global supply chain issues?

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_____
_____
_____
_____

Q: 4Mention one benefit of global supply chain.

_____
_____
_____
_____
_____
_____
_____

Multiple Choice Questions

Q: 1 Global supply chain management has _____ fundamental areas of focus.
(A) Four
(B) Three
(C) Six
(D) None of above

Q: 2Which main risk comes with working and managing a global supply chain?
(A) Cost risk
(B) Supply side risk
(C) Demand side risk
(D) Both (**B)** and **(C)**

9.7 LET US SUM UP

In this unit we learned that, while managing global supply chain it is important to place emphasis on logistics performance as there has been development in business to business international marketing. By doing this, industries are able to take advantage of the increasingly profitable global market. And also different criteria affecting on global supply chain.

9.8 KEY WORDS

Sway	Impact, Affect
Intricacy	Complexity, Complications, Difficulty
Esteems	Values, Respect, Regard
Pervasive	Prevalent, Penetrating, Extensive
Prominent	Greater, Important, Well known
Endeavoring	Attempting, Try
Errand	Task, Job, Assignment
Emerges	Arises, Come out, Make an appearance
Adhere	Stick, Cling, Attach
Imperative	Important, Vital, Crucial

Accentuation	Emphasis, Highlight
Inclinations	Performances, Tendency
Redundant	Repetitive, Unnecessary
Evolved	Developed, Progress
Oversees	Manage, Supervise
Appended	Attached
Obligations	Responsibilities, Duty
Feasible	Achievable, Practicable
Freight	Cargo, Load, Consignment, Delivery
Discrimination	Separation, Differentiation
Wary	Cautious, Careful, alert

9.9 SOME USEFUL BOOKS

- **https://en.wikipedia.org/wiki/Global_supply_chain_management**

- **https://www.ukessays.com/essays/marketing/supply-chain-of-indian-textile-and-apparel-sector-marketing-essay.php#:~:text=The%20Textile%20and%20Apparel%20Supply,channel%20as%20shown%20in%20fig.**

Answer

Check Your Progress

Question answer

Ans:1
In commerce, global supply chain management is characterized as the distribution of goods and services all through a trans-national organizations' worldwide network to maximize profit and minimize waste. Essentially, global supply chain management is similar to supply chain management, however it focuses around organizations and associations that are trans-national.

Ans: 2
The key aspects of supply chain management are Sourcing, Planning, and Logistics.

Ans: 3
There are two main global supply chain issues.

1. **Supply side risk**: Common supply side risks are regularly the way that it takes a long time to receive products from around the world, and suppliers may not really operate to the same quality standards.

2. **Demand side risk:** Demand-side risk mainly happen when organizations can't manage the customer base demands. This can happen when customer demand is higher than supply, and the company needs more stock to appropriately manage the customer demand

A company's growth often depends on expanding into new markets, where managing a supply chain becomes even more difficult. New products from unfamiliar markets add complexity to import or export operations, making consistent, and time to time delivery is a real challenge.

Ans: 4

The global supply chain truly works on every minute every day, just because of the time differences in different nations. So there is a logic that the chain never sleeps, it is constantly in a hurry and people are working to meet the supply chain requirements on various continents and at different times.

Multiple Choice Questions

Ans: 1 C

Ans: 2 D

UNIT: 10 PRE-PRODUCTION PLANNING

STRUCTURE:

10.0 OBJECTIVE

After studying this unit students will able to,

- Understand the primary purpose of pre-production planning in apparel industries.
- Understand the different types of merchandising process using before bulk production.
- Learn about different types of samples name which are very important part of pre-production process.
- Role of PPS (Pre-production sample) in pre-production process.

10.1 INTRODUCTION

Talking about garment manufacturing we usually consider cutting, sewing and finishing process. Be that as it may, garment manufacturing is not complete without the pre-creation processes. In this chapter we will learn what pre - production planning means, what steps they include and discuss about the steps of sample made before mass production.

What Pre-production planning mean:

Pre-production planning is a planning that is done before the mass production of garment. That incorporates sample development and approvals, sourcing and raw materials, piece of clothing costing, pattern making and process planning. Efficient production can't be reached without the pre-production planning.

Garment manufacturing is tied in with cutting, sewing and finishing yet there is a list of complex tasks in pre-production stage mass production can’t begin as a production buyer’s process, without completing this interaction, as the initial article of the cycle, on articles of textile production, especially fabric quality inspection and pre- production sampling. The quality process and sampling of all fabrics are very sensitive, garments makers should be cautious about smooth production and keeping the needed input flow to sewing. In the event that a manufacturing plant can't perform pre - production exercises appropriately, the processing plant may fall down in efficiency. For the most part, it requires in any event 12-13 days to go for mass production after getting fabrics from the supplier.The production planning team returns surprisingly to these pre- production activities.

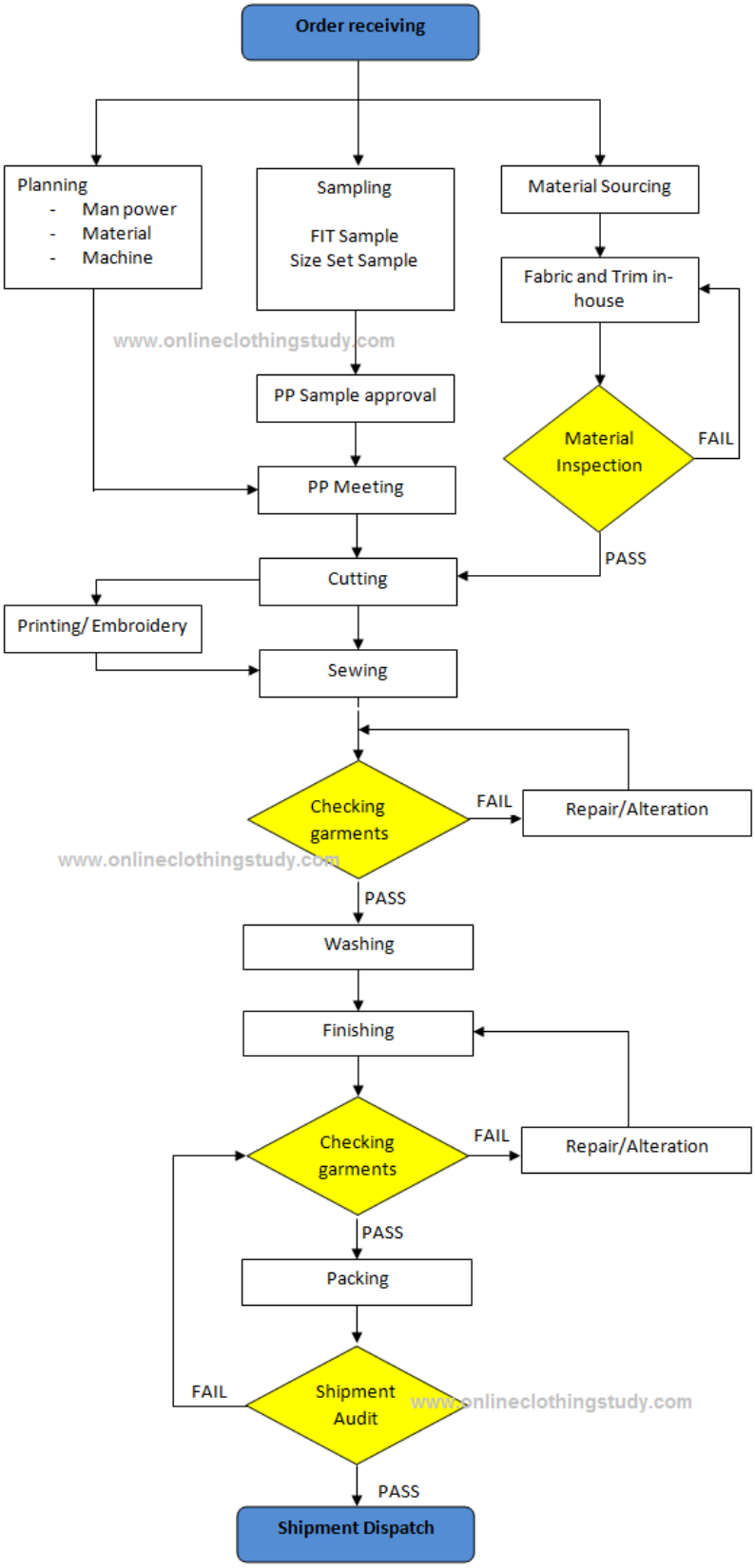

Figure:1 Pre-production planning chart

10.2 CRITERIA KEPT IN MIND WHILE MAKING PRE-PRODUCTION PLAN

A typical garment export house has following pre-production process:

Meeting with buyers

In this stage, the designer of a manufacturing factory shows their creations, and latest designs to buyers. Then again, if the buyer already has fixed design of a style and does not need many changes on it related to fit, fabrics or trims they discuss about those things with the merchandiser of the manufacturing unit.

Development of initial samples for the buyer

In this stage after receiving buyer's concept or instructions on the new style, samples are made with accessible fabrics and trims

Development of fabric sample, bit loom, print and embroidery artwork

The fabric is developed according to the buyer's requirement. Fabric development implies sourcing of client specific fabric with coordinating with properties, dyed and finished for solid colours. For the solid colour lap dip approval is a vitalcycle. Until lap dip sample is endorsed merchants re-submit lap dips. If there should arise an occurrence of yarn dyed fabrics merchants develop fabric sample with specified design, stripes or checks. These fabric samples called as Bit Loom. Different endorsements, for example, print and embroidery artwork endorsement and colour shading approval are done. It very well might be done a later stage at the time of pre-production.

In the manufacturing of clothing a typical pre-production planning is divided into six main stapes:

1. **Cost of Garment**
2. **Sourcing raw materials**
3. **Fabrics Quality Procedure**
4. **Process planning**
5. **Pattern Making and Grading**
6. **Pre-production sample and Quality Check**

Six steps of the pre-production planning process in clothing manufacturing

10.2.1 Costing of Garment

Costing of a garment is a process of figuring or calculating and combining raw material expenses, trims, labor, packaging work, shipping and operating costs. Overall it gauges and decides the expense of producing a garment.

Costing is a very critical and important stage. If the cost is low there will be no profit, if the cost is too high it will be harder to sell the item.

10.2.2 Sourcing Raw Materials

Sourcing raw materials incorporate fabric selection and discovering a sourcing organization to work with. These materials incorporate fabric and a wide range of trims and accessories. These elements go into the Bill of Materials in the Tech Pack.

Bill of Materials (BOM) is a complete list of all items with corresponding cost and quantities that are needed to assemble an item whether it's a garment, shoes or accessories. The primary motivation behind BOM is to estimate raw materials costs, plan purchases and diminish the amount of waste. It additionally helps you never miss a single thread, button, zipper or little detail when manufacturing your items

After the materials are selected and sourced, physical properties are being tested for mass production. This test should be possible with the assistance of a manufacturer or in-house testing labs.

10.2.3 Fabrics Quality Procedure

We can't cut fabrics without going through some fabric quality assessments strategies by a specific time after receiving from supplier; these are fabric's visual defects, shrinkage, shading, and distortion. If the fabrics fail to meet one of those quality checkpoints, garments maker needs to claim through purchasing a house and request fabric replacement. Some aggrieved fabric suppliers come to check the garment manufacturer's claim so that they take up the issue of another quality (short quantity/width shipment) in the fabric, sometimes needing more time to resolve the problematic fabric issue.

10.2.4 Pre-production Sampling

After completing all fabrics process garments maker needs to cut the size set sample (otherwise called PP sample) to do a pre-production meeting. In the event that the PP sample can't pass, the production line needs to remake the PP sample once more. At that point garments maker cut the pilot run and complete sewing and finishing process. Subsequent to completing the pilot run process, the garment manufacturer allowing for mass creation.

10.2.5 Process planning

After the raw materials are sourced, a pattern is approved and the cost of a piece of clothing is determined, the organization begins to plan the process with the factory. They plan when to begin cutting, when to submit the pre-production sample, when to sew and finish the final pieces of clothing. At this point the time period of the last examination and quality check is assessed and the shipment date is set.

10.2.6 Pattern making and Grading

Pattern making is the way toward making a plan of a piece of clothing. While constructing a garment the fabric is cut according the

pattern instruction and specifications. The principle reason for a pattern is to make 2D fabric sit appropriately on a 3D body. Subsequently it is made with the kind of fabric and trims as a top priority, and the planned fit.
Pattern is typically made by a specialized or technical designer or a professional pattern maker. They build up an initially fit pattern and then can re-develop it including remarks and amendments on a fit sample. After fit approval pattern maker does the grading for size set samples just for the specified sizes. The pattern is graded for the entire size range whenever everything is approved and the order is prepared for production.

New technologies like Tec packer allow you to do grading automatically dependent on your measurements. Rather than making the grading sheet separately here you can see your measurements and grading in one place.

10.2 BASIC INTRODUCTION ABOUT SAMPLES AND THEIR TYPES:

Sampling is one of the fundamental cycles in clothing manufacturing and it plays important role in attracting buyers and confirming the order, as the buyers places the order once satisfied with the quality and responsiveness of the sampling. It is the most essential and most significant stage of fashion merchandising. Sampling department makes samples based on the particular and requirement by the buyer. Sampling in merchandising might be characterized as "The concept, perception and ideas, of fashion designer formed into product samples, in systematic phases of product developed, with specialized and quality clarity in a development." Though sampling is a difficult and time bound cycle, it will get the exporter with getting the order from the buyer. Prior to placing any order to the manufacturing factory, the buyers needs to know whether the processing plant is capable for producing the styles with the ideal quality levels or not. The samples decide the capacity of exporters to manage any given style of garment.The buyer gets to the ability of exporter just with the help of Samples. In the event that the samples are of acceptable quality naturally the buyers will be willing to place the order to industry. Sampling additionally work as a bridge between the production and marketing department, consequently it has the impact of both marketing just as production department. So it is fundamental that the samples ought to be creative and ought to be produced with optimum (ideal) quality.

Different types of samples:

Sampling process shifts from one buyer to another, and type of style also, yet in industry there is specific order of sampling that is followed, the stages and reason for sampling might be same however terminology used might be different and it absolutely depends upon the buyer. The typical samples are namely described as:

1. Design development
2. Proto sample
3. Fit sample
4. Ad or photo shoot sample
5. Sales man sample
6. Pre- production sample
7. GPT sample (Garment Performance test)
8. Size set sample
9. TOP sample (Top of Production)
10. Wash sample
11. Shipment sample

These samples are shipped off the buyer one after another for approval from the buyer and to proceed further. Apart from these typical steps, some of the time the buyer recommends a few changes in the prepared sample, and afterward incorporating those suggestions makes a counter sample and it is shipped off the buyer for approval. The sampling department helps the merchandise department for discovering fabric utilization per unit article of clothing and in this way helps in the costing of garment.

People involved in sampling:

A few people and departments are involved in sampling process. They are: Merchandising department, Sampling / Product development group, and trim and fabric store, Pattern making department, Quality assurance team, Dispatch department and so forth.

Importance of Samples

Sampling is the heart of any export order preparing process. The eventual fate of any style simply relies upon buyers and manufacturing factory which are enhancing the samples. So it is vital to understand the sample development cycle to control quality and costs in the initial stage or in the sampling advancement. A merchandiser assumes the central role in sampling process as he is the only person between the buyer and production line who comprehends the buyer determination, technical details and time line of sampling. The way toward sampling is about the possible fulfillment of specific needs. It is about products the organization can make or out-source beneficially for which there is a market demand. Sampling is the most ideal approach to place an order. The purpose of sampling is not just to get mass order and furthermore it gives some extra advantages to the exporters. The utilization of technology, computer based designing, just as innovation and creativity are significant tools in driving apparel sampling.

10.3 PRE-PRODUCTION SAMPLE AND QUALITY CHECK

The Pre-productionsample (PPS) is an example of the product that is made before to bulk manufacturing begins. It helps purchasers examine the design, materials, labeling and construction details like stitching.

Figure: 2, Pre-Production Sample Quality Checking

At this stage the buyer can request changes if necessary. In any case, depending upon the supplier agreement, one may incur extra expenses which might be definitely justified to guarantee the best result. When the PPS sample has been approved the bulk production can begin.

Pre - Production activities operation Flow chart of Garments Manufacturing

Preparation for the PP Meeting:
1. Inform all departments to prepare for the PP Meeting:
2. Master File.
3. Approved Fabric & Trim Swatch.
4. Fabric & Trim Availability Report.
5. Production Plan.
6. Line Layout & Manpower Allocation.

↓

Size - Set Sample Preparation:

This sample shall be done with the involvement of Line In-Charge, Line Supervisor, Line Q.C, Work-Study Officer, Mechanic and Technical / Sample Room. Shall follow buyer's Sample, Comments and Operational break down prepared by Work-Study officer.

↓

Critical Operation Identification:
During Size - Set Sample / Line Sample development, Production, Quality, IE Staff and Mechanic together shall do this study and identify all critical points at the construction of a garment.
↓
PP Meeting (Internal & Buyer):
To discuss and take necessary Corrective & Preventive Actions before starting production of each style and to make sure every department is updated with the Fabric / Accessory Requirement, Technical Specifications, Testing Requirements, Workmanship, Target, Shipment Details, etc.
↓
Approval for Pilot Cut:
To proceed with the pilot cut prior to going for Bulk Cutting.
↓
First Production Analysis:
To compare the Initial Output (Finished Goods) of Pilot Run against Buyers approved Sample / Standard prior to going for Bulk Cutting
↓
Finalizing Pattern for Bulk Cutting:
To verify and make sure to use the correct pattern for the Bulk Cutting.
↓
Approval for Bulk Cutting:
To assure and certify that all Pre-Production activities have been completed prior to starting Bulk Cutting of each style.

Purpose of Pre-production Garment Samples:
The pre-production samples are submitted so the buyers can audit an example of what the clothing industry intends to deliver. The buyer should see the pre-production sample to decide if all standards have been met by the supplier. Buyers can check the body measurements, sewing construction, fabrics colour, trim tones, trim quality and placement, and so forth.
The pre-production samples should be submitted PRIOR to apparel production with the goal that the buyer has the opportunity to point out the provider if any mistakes or misconceptions are found. For example, the buyer may notice that the brand label was sewn in wrong place in garment or perhaps the industrial facility unintentionally utilized a totally mistaken brand label in the piece of clothing. The manufacturing factory should already understand the buyer requirements. However, issues are often over looked. It is vital (important) that the buyer has an example to audit before full production.
The main purpose of the pre - production submission is to distinguish issues as early as possible so that corrective action can take place before production starts. Generally, makers are expected to NOT start production until the pre - production samples are inspected and approved by the buyers. Make sure to check with the buyer in regards to the quantity of

articles of clothing they require and the garment sizes that are required.
The pre-production submissions ought to be manufactured to act as an example of what you intend to produce and deliver. The pre-production samples should be produced using actual bulk fabric (production run fabric).
On occasion buyers will permit you to submit pre-production samples without all the final trimming, for example, hangtags and price tickets. However, the most secure strategy for everybody included is for the producer to provide pre-production samples with full trimming so there is no space for miss-understanding
Note: Pre-production sample requirements are not just for garments and style adornments. Pre-production review can be conducted on fabric, trimming, and so on. For example, before factory moves to produce fabric, they should review yarn colour tones, yarn construction et**c.**

How is PPS different from other types of samples

Apart from the pre-production sample there are different kinds of samples ordinarily utilized in the garment manufacturing industry.
The PPS sample is the primary basic step before mass production. It can likewise be utilized for pre-selling and advertising purposes. After the PPS sample is approved, it turns into a Production sample.

Production sample at that point goes into a limited production run, sometimes limited to a single size or colour way. At this stage the producer can perform a size race to confirm that eventual products are reliable with size guidelines.

After the effective limited run of the production sample the garments are inspected to guarantee the quality. The proper beginning of production begins with the Top Production sample. At this stage the Quality Control inspector of the organization visits the manufacturer to checkout the production line and pick an article of clothing for assessment. In the event that the production is made in-house a similar process applies – samples are examined and the quality check is performed.

For marketing and presentation to potential purchasers the sales sample is utilized. The Sales sample addresses the genuine product. This kind of sample allows sellers to decide the marketability of the product. After approving the idea subtle changes can be made to fabric combinations, colourways or trims. However, any of those progressions can't influence the production process.

Altogether there are 12 types of garment samples that you should know.
Fit sheets
After the organization receive the first fit sample from the manufacturer they ensure the ideal fit is accomplished. Furthermore, that the sample

compares to the important measurements and specifications. To evaluate the sample and suggest any updates the Fit table is made.
As you enter your sample specs in the FIT section, the table screens them with your provided tolerance range, and if any differences are discovered it instantly highlights them for you.

Study of approved sample

Investigation of approved sample helps find the most ideal approach to produce the article of clothing. At this stage organizations can characterize the most efficient approach to manufacture their product.

When the example is endorsed and the materials are sourced the production planning department leads a pre-production meeting. Over the meeting production group, quality group and sourcing group share their remarks and talk about customs.

They additionally schedule the planned cut date, shipment date and a purchase order is placed with the apparel manufacturer for mass production. The agreement has to be very detailed and incorporate delivery dates, fabrics, manages costs. It ties both the brand and the factory, and ensures that each party satisfies their commitments. Before the mass production starts all samples ought to be approved and meet the **p**rerequisites and details like labels, size sets, tags, packaging, and so forth

Check Your Progress

Question Answers

Q: 1What is Pre-production planning in apparel industry?

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_____

Q: 2Which steps are mainly include in clothing manufacturing for pre-production planning?

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_____

Q: 3What is the importance of samples in clothing industries?

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Q: 4What is Pre-production sample?

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Q: 5What is the main purpose of PP Sample in clothing industries?

_____
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_____
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_____
_____

Multiple Choice Questions

Q: 1 Full name of PPS is _____?
(A) Fit sample
(B) Pre-Production Sample
(C) Wash sample
(D) None of above

Q: 2 Which of the following is not part of 5 M's?
(A) Money
(B) Material
(C) Motion
(D) Men

Q: 3 Which of the following function is related to the time table of activities in production planning?
(A) Scheduling
(B) Dispatching
(C) Routing

(D) Follow up

Q: 4 Pre-production planning incorporates_____.
(A) Garment Costing
(B) Sourcing and raw materials
(C) Sample development and Approvals
(D) All of above

10.4 LET US SUM UP

In this unit we learned about the main purpose of pre-production planning and control which establishes routes and schedules for the work that will ensure the ideal use of **5 M** of merchandising which is: Money, Men, Materials, and Machines, Method and ensure the coordinated flow of work so that required number of products are manufactured in the required quantity, required quality and at the required time at optimum efficiency. A basic knowledge of sampling part and different types of samples and their approval from buyer which can prevent mistakes during bulk production has been discussed. 9624737644

10.6 KEY WORDS

Implies	Means, Intend
Vital	Important, Essential, Crucial
Gauges	Estimates
Amendment	Rectification, Redress, Revise, Corrective changes
Diminish	Reduce, Decline, Lower
Assess	Evaluate, Rate and value, Appraise
Comprehends	Understand, Contain, Apprehend, Grasp
Eventual	Final, Possible
Influence	Affect
Accomplished	Achieved, Carry off, Do, Compass
Endorsed	Approved,
Prerequisites	Requirements, Important

10.7 SOME USEFUL BOOKS

- https://techpacker.com/blog/manufacturing/pre-production-processes-in-garment-manufacturing/#:~:text=Pre-production%20process%20is%20planning,w
- https://onlinegarmentsacademy.blogspot.com/2019/03/production-preparation-processes-of.html
- https://www.textiletoday.com.bd/fashion-merchandising-importance-of-sampling/

- https://www.apparelsearch.com/terms/p/pre-production_submissions_apparel.htm

Answer

Question Answers

Ans:1

Pre-production planning is a planning that is done before the mass production of garment. That incorporates sample development and approvals, sourcing and raw materials, piece of clothing costing, pattern making and process planning. Efficient production can't be reached without the pre-production planning.

Ans:2

In clothing manufacturing a typical pre-production planning is divided into six main stapes:

1. Cost of a Garment
2. Sourcing raw materials
3. Fabrics Quality Procedure
4. Process planning
5. Pattern Making and Grading
6. Pre-production sample and Quality Check

Ans:3

Importance of Samples:

Sampling is the heart of any export order preparing process. The eventual fate of any style simply relies upon buyers and manufacturing factory which are enhancing the samples. So it is vital to understand the sample development cycle to control quality and costs in the initial stage or in the sampling advancement. A merchandiser assumes the central role in sampling process as he is the only person between the buyer and production line who comprehends the buyer determination, technical details and time line of sampling. The way toward sampling is about the possible fulfillment of specific needs. It is about products the organization can make or out-source beneficially for which there is a market demand. Sampling is the most ideal approach to place an order. The purpose of sampling is not just to get mass order and furthermore it gives some extra advantages to the exporters. The utilization of technology, Computer based designing, just as innovation and creativity are significant tools in driving apparel sampling.

Ans:4

The Pre-production sample (PPS) is an example of the product that is made before to bulk manufacturing begins. It helps purchasers examine the design, materials, labeling and construction details like stitching.

Ans:5

The main purpose of the pre-production submission is to distinguish issues as early as possible. So that corrective action can take place before production starts. Generally, makers are expected to NOT start production until the pre-production samples are inspected and approved by the buyers. Make sure to check with the buyer in regards to the quantity of articles of clothing they require and the garment sizes that are required.

Multiple Choice Questions

Ans:1 (B)
Ans:2 (C)
Ans:3 (A)
Ans:4 (D)

Reference:

Fig:1https://3.bp.blogspot.com/-NQQ2KCfN7p4/UepZMKjsckI/AAAAAAAABIc/uvurQ7b-SVM/s1600/garment+process+flow+chart.png
Fig:2https://www.intouch-quality.com/hs-fs/hubfs/img/site/service/Garment_inspection_2.jpg?width=400&name=Garment_inspection_2.jpg

UNIT: 11 GARMENT STYLE AND COMPONENT PART

: STRUCTURE :

11.0 OBJECTIVES

- To learn about garment style
- To identify and compare garment components parts
- To understand garment style and its components parts

11.1 INTRODUCTION

components parts are accessories used to decorate, reinforce, close, or modify Garment style. This section introduces the most common components, such as fasteners.

11.2 THE ROLE OF COMPONENTS IN GARMENT

The role of components is to support structure (line), opening and closing (zip), increase strength (interface), decoration (beads), isolation (filling), shape (shoulder pad)) And generally, improve product quality. When selecting components, designers must consider maintenance, cost, quality, aesthetics, safety, and end-use.

The following table lists some common components and their end uses:
1. Sewing thread: used to connect fabric pieces, used to connect zippers, and used for decoration. New yarn and wool yarn for knitwear.

2. Beads and sequins: decorate colors and textures, capture light and increase the weight of the product. For example plastic, wood, metal, pearl, and semi-precious stones.

3. Ribbons, ties, ropes, and borders: used to connect borders or decorative elements. Used as a tie and fastener. Examples: fabric strips or different weights, patterns, widths, and fibers. The diagonal binding is stretched when sewing the edges. Braids can have tassels, beads, feathers, and embroidery to achieve a decorative effect. The strap can be attached to the fabric by folded edges or seams.

4. Interface: convenient for sewing, strength, shape, and structure or as an adhesive. Examples: wool seams or glues, used to bond fabrics to ironing (fusion) or fabric paper backing.

5. Handmade patterns: speed up the decoration process and increase flavor. Examples: school and team badges, children's animal prints, etc.

6. Shoulder pads: shape the shoulder shape of clothes. The foam pad can be covered with cloth.

7. Back: used for strength and decoration. There are different types of zippers with different weights; some are made of nylon and some are made of metal. Choose the weight according to the weight and color of the fabric, and use metal zippers (such as jeans) when strength is needed.

Frequently used Fasteners
1. Zipper: The zipper is attached to the taps, which is usually made of cotton, polyester, and polyester cotton.

2. Buttons-Buttons come in a variety of sizes and materials. The designer chooses the best material and button size to match the product and care. The buttons may be damaged during washing or may be dissolved in dry cleaning chemicals. Most buttons have buttonholes, but some buttons have belt loops. Buttons are not only used for fixing but can also improve the quality of products by matching or contrasting colors or adding functions with unusual shapes or patterns. Buttons that match the fabric perfectly.

3. Hooks and eyes-usually metal, used when flat attachments are required. They can be sewn by hand or machine in a ribbon shape to provide hook and loop lengths like underwear and corsets. They are usually black or silver.

4. Velcro fastener: Velcro fastener is a kind of hook and loop fastener, especially suitable for baby products, easy to use, safe, and fast. If the fabric is thin, it is not suitable because it is bulky. And crochet hooks are suitable for thinner fabrics. It is washable and durable, but over time, the hooks will become entangled with other fibers, and if they are not cleaned regularly, their effectiveness will be reduced.

5. Push down the pin. Thumbtacks or buttons are simple flat fasteners used in many textiles. They can be made of metal or plastic, can be part of the design or just a cheap fastener. They must be combined correctly and the selected size must correspond to the force that can be exerted on the fixture.

6. Eyelet and shoelace: Place a metal or sewn sleeve on the top of the product and pass the shoelace to form a buckle. It can be decorative, and you can also customize the size of the item. This style can be found in corsets. As well as clothes and shoes.

7. Buckles: Buckles are very popular as fasteners for belts, bags, and shoes; they can be metal or plastic, or they can be very rich or very simple decorations. Buckles usually have holes for fastening, or you can simply put on the fabric to tighten or loosen. buckle.

8. Toggles: The toggles are similar to a button, but it is cylindrical and can be made of wood, metal or plastic. You need a loop or shoe strap to secure it, and some modern switches have a spring clip action to secure them. It can often be seen in a backpack.

9.Loop rope: The rope buckle consists of a rope and an open channel through which the rope is passed to tighten and close the clothes. Drawstrings are very popular on coats, jackets, belts, and bags.

Textile components and the future

Like fiber and fabric technology, innovation in component technology continues. The use of electronic components such as LED s and fiber optic cables is still a young field in component design. Soldiers wear them on their clothes to detect harmful chemicals or warn them that the enemy has found them. thermal insulation cotton can be improved by temperature control technology; they are called PCMS (phase change material), which are small micro-capsules embedded in cotton material. This means that the cotton material will automatically respond to temperature changes. It is used for jackets that are worn under rapid temperature changes, such as when skiing. Or airport ground crew and boots. Inflatable technology is another innovation in component technology, which replaces fillers, such as bras, with inflatable pillows.

11.3 DESIGNATION OF CLOTHING COMPONENTS

Case study: Checking the quality of clothing
Objective: Checking the material quality, workmanship, and size of men's shirts.
Requirements:
a smooth men's shirt,
a, well-lit flat table,
a tape measure,
a copy of the recorded observations.

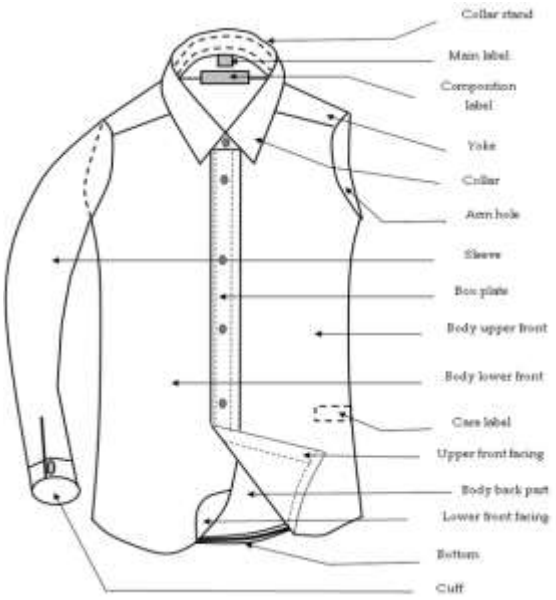
- Material control:
- Put the buttoned shirt
- face up on the table.

Check the fabric carefully for damage. In addition, handling errors may occur, such as stains and dirt marks. List all defects in the table and calculate how often they appear on the front, back and sleeves.

Also, pay attention to the decorations used on clothing: buttons, hang tags, hang-tags, etc. They must be visible, complete, and sticky. Finished garment-Take a close look at all visible seams/stitch lines on the front of the garment.

Pay attention to errors, such as differences in stitches per inch, torn stitches, stitch tension differences, skipped stitches, creases, uneven seams, embroidering on the wrong side, seam/hem waviness, etc. The table format is incorrect.

Size control-put the shirt on the table. Without pulling the fabric, measure the following values in inches or centimeters.



1. Chest – Place the tape end at the lower end of the armhole and take it straight across to the other side of the shirt.
2. Front length – Measure from high shoulder point, down the front body to bottom hem.
3. Across shoulder – Measure straight across shoulder from point to point (the shoulder point is where the shoulder seam meets the top of the armhole).
4. Center back length – Measure from the center of back neck seam down back body to bottom hem.
5. Sleeve length – Measure half of the shoulder width starting at the center back neck, to the shoulder point, then along the centerfold of the sleeve to cuff edge.
6. Sleeve/cuff opening – Measure straight across the bottom of the sleeve from the underarm side of the cuff to the centerfold of the cuff.
7. Arms-eye - Measure from the bottom of the armhole to the top of the armhole following the contour of the armhole.
8. Neck width – Measure across from high shoulder point to high shoulder point at the base of the collar.
9. Neck depth (front and back) – Draw an imaginary line from the high shoulder point to the base of the neck separately for front and back.
10. Neck/collar circumference – Undo all buttons and lay collar flat, measure from center of the button to the farthest end of buttonhole.
11. Collar point – Lay collar flat, measure from the base of the collar to the outer edge of collar point.

CHECK YOUR PROGRESS

1. How to inspect a man's shirt for quality?

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2. Write about textile components and their future.

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3. Write about frequently used fasteners.

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4.Explain some common components and their uses.

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MULTIPLE CHOICE QUESTIONS

1. Which component is used for rigidity and structure?
(a) Boning
(b) Elastic
(c) Shoulder pads
(d) Velcro

2. Which component is used to allow for opening and closing?
(a) Shoulder pads
(b) Threads
(c) Sewing threads
(d) Zipper

3. _____ components is used to embellish the garment.
(a) Interfacing
(b) Zipper
(c) Beads
(d) Sewing threads

11.4 LET US SUM UP

In this unit, we learned that the function of the component is to support the structure (engraving), allow opening and closing (zip), increase strength (interface), decoration (beads), insulation (upholstery), shape (shoulder pad)). And generally, improve product quality. When selecting components, designers must consider maintenance, cost, quality, aesthetics, safety, and end-use.

11.5 KEYWORDS

components	one part of a whole thing
Fringing	material used to make a fringe
Rivets	to fasten parts together with a rivet
Boning	to help a garment maintain its shape and stay wrinkle-free.
Velcro	a fastener for clothes or other items, consisting of two strips of thin plastic sheet, one covered with tiny loops and the other with tiny flexible hooks, which adhere when pressed together and can be separated when pulled apart.
Snag	an unexpected or hidden obstacle or drawback.
Press-studs	a device that fastens something by closing or locking with a short, sharp sound especially: a set of two metal or plastic pieces that fit tightly together when pressed pockets with press studs.
Toggles	a short rod of wood or plastic sewn to one side of a coat or other garment and pushed through a hole or loop on the other side and twisted to act as a fastener.
Rucksacks	a bag with shoulder straps that allow it to be carried on someone's back, typically made of strong, waterproof material and widely used by hikers.

11.6 SOME USEFUL BOOKS

1. The fundamental of quality assurance in the textile industry
2. An introduction to quality control in the apparel industry

Sources of Images
All images are from reference books and internet.

ANSWER
1 = Put the shirt on the table without stretching the fabric, and measure the following in inches or centimeters.
1st Chest-Attach the end of the tape to the bottom of the armhole and transfer it directly to the other side of the shirt.
2. Front body length: measured from the top of the high shoulder through the front of the body to the bottom.
3. Cross the shoulders-pass directly through your shoulders from one point to another (the shoulder point is where the shoulder seam meets the top of the armhole).
4. Mid-back length: measured from the center of the neckline seam to the bottom edge.
5. Sleeve length-measure half of the shoulder width from the center of the back to the shoulders, and then along the central fold of the sleeves to the cuffs.

6. Sleeve/Cuff-Measured at the bottom of the sleeve from the forearm side of the cuff to the centerfold of the cuff.
7. Armhole Measure the distance from the lower edge of the armhole to the upper edge of the armhole along the outline of the armhole.
8. Neck size: measured from the top of the shoulder to the top of the shoulder at the bottom of the neck.
9.Neck Depth (Front and Rear): Draw an imaginary line from the top of the shoulder to the bottom of the neck, separated back and forth.
10. Neck Circumference/Neck Circumference: Unbutton all the buttons and straighten the collar, measuring from the middle of the buttons to the end of the buttonhole.
11. Collar Point-Straighten the collar, measuring from the bottom of the collar to the outer edge of the collar point.

2. Like fiber and fabric technology, component technology is constantly innovating. The use of electronic components such as LED s and optical fibers is still an emerging area of component design. Detect harmful chemicals on soldiers' clothes or warn them that the enemy has discovered their presence. thermal insulation cotton can be improved by temperature control technology; they are called PCMS (phase change material), which are small microcapsules embedded in cotton material. This means that the cotton material will automatically respond to temperature changes. It is used for jackets that are worn under rapid temperature changes, such as when skiing. Or airport ground crew and boots. Inflatable technology is another innovation in component technology, which uses inflatable pillows instead of fillers, such as bras.

3 = The first sewing thread: used to connect fabric pieces, for support, and decoration. Example: Wool seams or glue used to bond fabric to paper or ironing fabric backing (melting).

5. Handmade patterns: speed up the decoration process and increase flavor. Examples: school and team badges, children's animal prints, etc.
6. Shoulder pads: shape the shoulder shape of clothes. The foam pad can be covered with cloth.

7. Back: used for strength and decoration. For example metal rivets, diamond rivets, decorative rivets for jeans.

8. LED lights: used for decoration to make them visible in the dark and increase safety. Examples: Used in children's shoes, fashion belts, and suits.

9. Bones: used for stiffness and structure.Example: Used for dresses, corsets, and strapless underwear, which can be made of plastic or metal and covered with fabric or steel.

10. Elasticity: increase the elasticity and reduce the volume of the waist, cuffs, edges, or seams of clothes or articles. For example, wide satin ribbons, gathered elastic threads, decorative belts, and belts.

MCQ ANSWER
(a) Boning
(c) Zipper
(c) Beads

UNIT: 12 KNOWLEDGE ABOUT SPREADING TECHNOLOGY AND EQUIPMENTS

: STRUCTURE :

12.0 OBJECTIVES

- To understand the significance of mass production of apparel
- To describe the stages and systems of mass production
- To identify the fabric and garment defects before and after production

12.1 INTRODUCTION

For centuries, the development and trade of textiles have been one of India's strengths. The past few decades have also witnessed the development and growth of the apparel industry. The Indian clothing industry is a world-renowned source of clothing, which combines the latest global fashion trends with exquisite designs inspired by local culture. Globalization has greatly helped trade.

India's clothing industry: India's clothing industry is a trillion-dollar industry. Overall, about one-quarter of garment production and quality control in the Indian garment industry, textile, and garment manufacturing is for export and three-quarters for the domestic market. The industry has more than 1 million units and directly and indirectly employs approximately 60,000 employees, almost equal. The indirect part

provides support to the direct manufacturing industry in the form of items related to the apparel industry, including sewing/embroidery threads, borders, machine parts, cardboard, and packaging materials.

The organized garment industry accounts for about 20% of the entire industry, with a focus on exports. As the apparel industry is driven by fashion, and fashion is constantly changing, manufacturing companies must respond to changing trends. With the development of media such as television and the Internet, the requirements are getting higher and higher.

12.2 FABRIC TESTING, SPREADING TOOLS, TECHNIQUES AND EQUIPMENTS

Clothing production is usually carried out in four steps:
1. Procurement and testing of raw materials
2. Laying and cutting of fabrics/materials
3. Assembling products
4. Finishing and packaging

In addition, add stage "additional" Value"-refers to any process that increases the overall value of a product, thereby increasing the value of the product. This add-on is designed to improve the usability and service/functionality of the product and/or its aesthetics. This includes special equipment for yarns and fabrics (such as special garment washing, such as sanding or enzymatic washing of denim) or surface decoration (such as printing, embroidery, etc.). This depends on the style of the product and can be done before, during, or after the product is assembled.
Raw Material Inspection The garment manufacturing process starts with the acceptance of raw materials and their fabrics and decorations (zippers, buttons, seals, labels, tags, etc.). Check for defects in the organization. Ideally, check 100% of the resulting tissue before cutting; however, if the substance comes from a reliable source or the substance manufacturer confirms that the substance has no defects, only a representative sample number is checked.
Defects can be divided into the following categories according to their sources:
1. Yarn defects
2. Weave defects
3. Dyeing defects
4. Equipment defects

- Yarn defects

1. Thick and thin ends: the warp diameter is larger or smaller than the usual fabric.
2. Fluffy and fluffy balls: Fluff is loose or frayed fibers that originate from threads. They can be formed into small balls and woven into fabrics.

3. Slub: A noticeably thicker point on the yarn, characterized by smooth twist and more or less duration.

- Weave defects

1. Stripe: Filling strip on the entire width, which is characterized by its appearance and the usual color or texture of the equipment.
2. Barre': an unintentional and repetitive visual pattern of continuous stripes, usually parallel to the direction of the fabric pad or circular knitted fabric.
3. Slate fill line: The fill line or color swatch is not at right angles to distort the line.
4. Filling the bowknot: Fill the bowknot with lines or colorful patterns.
5. Broken End: Part of the chain is missing.
6. Floating thread: A thread that flows freely on the thread of the opposite thread system normally used for weaving.
7. Kink: A small piece of a spontaneously curved line. Also called curls, curling lines, twisting lines, and roaring.
8. Reading error: The warp streaks are caused by the incorrect distance between the ends of the fabric.
9. Smash-The area where the fabric is torn due to the simultaneous breakage of a large number of adjacent warp threads.

- Dyeing effects

1. Color gradient: The color of one area bleeds or overlaps with the color of another area.
2. Shading: The color of bleach is uneven in different places.

- Equipment effects

1. Bag: Not suitable for the fabric lying flat on the cutting table.
2. Tooth: The area where the tissue is damaged by wear or friction.
3. Cutting, tearing, bending, and folding.
4. Hole marks An enlarged hole or deformed area along the edge of the fabric, which is caused by placing the fabric sideways during the trimming process. Also called needle mark.
5. Uneven finish: Uneven finish everywhere.

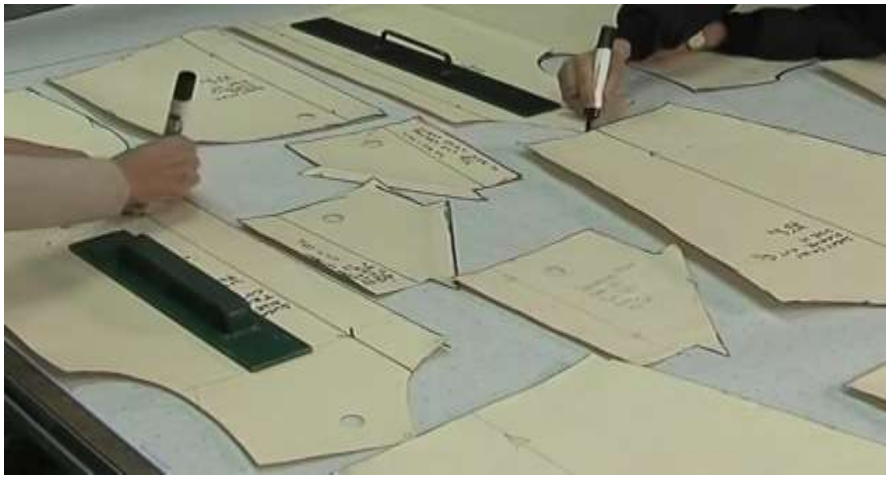
Fabric Inspection and Testing

There is an internationally organization inspection system that can determine how to inspect an organization and what is considered an "OK" organization. In all systems, faults or defects are rated according to size, type, category, etc. Adding a rating of a given linear length, the substance is considered "accepted" or "rejected". Some companies adjust their systems to existing systems according to their needs and specific organization types. The product being manufactured (style, market, function, baseline, etc.).

In addition, certain tests were conducted to check the suitability of the fabric for its end-use. The test can be a standard test performed on each organization. The manufacturer may be the final product specifically requested by the buyer. These tests include color fastness (light, wet,

sweat, chlorine, etc.), thread count, fabric weight, shrinkage, flamethrower, etc. Determine the effect and duration, check the repair/fixation. When the fabric is suitable for sanding, it is sent to the selected process. Otherwise, the fabric will be torn off. The most effective way to plan marks is to use specialized computer software or CAD systems. and it is planned to be carried out on the monitor. This method saves time and eliminates most of the errors associated with manual planning. The imprint of the final mark is used for its reproduction, which ensures the preservation of the tissue consumption per unit product.
Laying and Cutting of Fabric / Material: The next stage in the production of garments is the planning and processing of the cutting of the fabric.
This involves the following steps:

1. Marker Planning:
A marker is defined as the placement of pattern pieces on fabric in such a manner that the consumption of fabric per garment is optimized. The first stage is to identify the number of pieces that make up the entire pattern of one unit of item. The planning of the marker defines the average consumption of the fabric per piece which ultimately affects the cost of the product. The marker may be planned by manually placing pattern pieces on a defined width of the table and creating permutations till the most optimum length is achieved. This is very time-consuming, especially where the number of pattern pieces involved is high (such as in a formal jacket). There is also the problem of copying the marker so that it can be replicated for multiple lays. The more efficient technique of marker planning is by using specific computer software or CAD system. In this, the pattern pieces are fed into the system (digitized) and planning is done on a monitor. This technique is time-efficient and eliminates most of the errors that are related to a manual plan. A printout of the final marker / s is taken for replication which ensures that the consumption of fabric per unit of product is maintained.



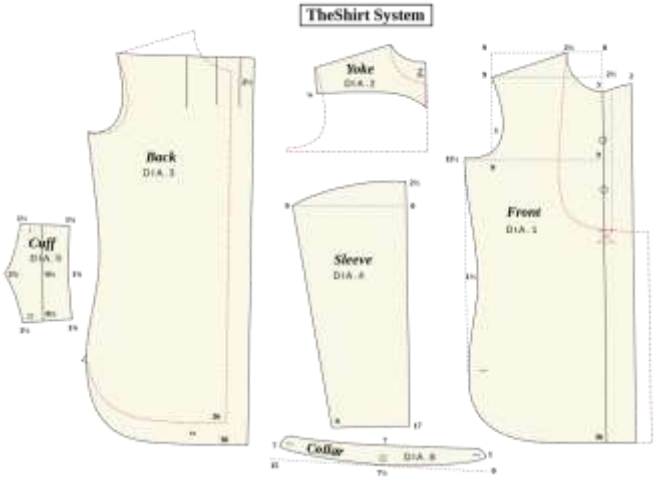
(Figure 12.1 marker planning)

2. Spreading :

drape the fabric and layer it on the table. The length of the layer is determined by the mark. The multi-layer fabric is folded and unfolded along the long side. The fabric can be unfolded manually, or it can be unfolded using a machine called a spreader. These machines can be controlled by mechanical, electrical, electronic, or computer. The final product of the painting process is called modeling. This will also affect the cutting equipment used. When preparing to lay, make sure that each layer contains only one fabric.

(Figure 12.2 Fabric Spreading Machine)

3. Marking: Apply the pattern to the top layer according to the indication mark. In some cases, you can use a computer to print out the marks on a paper of the same width as the fabric to cover a layer, and then cut it into a fabric layer.



(Figure 12.4 Marking)

4.Cutting :

The layers are simultaneously cut by manual or computer-controlled machines. There are different types of machines such as straight knives, round knives, belt knives, and punching machines. The layer height, that is, the number of layers per layer, depends on the type of cutting equipment and the dimensional stability of the tissue. Each type of cutting equipment has its advantages and disadvantages. For example, the straight knife machine is the simplest and cheapest cutting equipment on the market; however, it is not the best choice for cutting knitted or elastic fabrics because it does not control the fabric size stability A flexible handle, and a cutting device used to cut the layer is usually sold. This is because several scissors cannot cut the layer accurately, and the time and effort required to do so are longer than they can be. It may be in production.

(Figure 12.5 Cutting Machine)

5..Bundling: The cut parts are grouped for another sewing/embroidery/printing process, etc. The number of pieces in a package depends on the type of production plant and the sequence of the process. A package can contain all the components of a package. Clothes or just a few pieces. Perform component identification together with grouping, which identifies the shift number within the shift. It does this by cutting garment details from a single layer of fabric.

(Figure 12.6 binding)

12.3 APPAREL PRODUCTION PROCESS

1. Sewing:

The garment is then sent to the assembly or sewing area, which consists of various types of sewing machines. The sewing machine can be multifunctional. They can be used for different types of sewing operations, or they can be specialized machines, that is, they are only used for specific operations. The most common machines in the first category (multipurpose) are single-needle or shuttle machines. Two threads are used when sewing: one thread through the needle from above and the other thread through the bobbin from below. This machine can be used for any type of fabric and any type of sewing process. In the assembly process, that is, combining several pieces of clothing into a complete piece of clothing, one or a combination of several production systems can be used.

Some of them are:

The sewing system-each Each operator or tailor collects the whole piece of clothing. The system is mainly used for the manufacture of customized clothing tailored to individual orders. Operators are highly qualified and able to work on different types of machines.

Modular or teamwork system: The garment is assembled by a group or a group of operators. It is the most popular system in the apparel industry. Each team is a mixture of skilled, semi-skilled, and unskilled workers. And assign assignments according to the skill requirements of the construction process.

Unified Manufacturing System: The packaging process is broken down into smaller units called operations. Each operator is assigned one or more operations to be performed on the sewing machine. Parts are transferred from one operator to another. In a given scenario that allows complete assembly of products, the system is effectively used in departments with large production capacity and/and clothing with many operations, as well as production departments dedicated to the manufacture of a single product. This depends more on the training of the operator. Operators are trained to operate certain machines and certain types of operations, so their productivity is high. The system is not suitable for clothing with small orders and few transactions.

2. Finishing and packaging:

Garments have been sorted and packaged. The finishing process includes final inspection, decontamination, repair, pressing, and folding. The ironing technique also determines the final appearance of the garment. Clothing (folds, fold size, etc.). There are many ways to pack clothing. Some clothes are wrapped in hangers (coats, jackets, suits, children's clothing, etc.), some are crumpled (shirts, T-shirts, sportswear, etc.), and some are folded and then wrapped on hangers (trousers). The

type of packaging depends on the technical characteristics of the buyer, the demonstration technology at the point of sale, the number of clothes (number of people), the price of the clothes, etc. All types of export packaging are specified above. It can be used according to the buyer's instructions. Clothing packaging is different from packaging.

CHECK YOUR PROGRESS

1. What do you understand by the term 'Mass Production'? What is its significance in today's economy?

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2. Discuss the importance of fabric inspection before processing.

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3. Describe laying, spreading, marking, and cutting.

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MULTIPLE CHOICE QUESTIONS

1. The layers are cut simultaneously using machines that may be controlled either manually or through a computer system is called…

(a) Spreading
(b) Bundling
(c) Cutting
(d) Finishing

2.A _____is defined as the placement of pattern pieces on fabric in such a manner that the consumption of fabric per garment is optimized.
(c) Cutting machine
(d) Marker
(e) Sewing
(f) Packaging

12.4 LET US SUM UP

In this unit, we discussed in detail the collection and inspection of raw materials, laying and cutting of cloth/materials, product assembly, finishing, and packaging. The garment manufacturing process starts with the procurement of raw materials. Materials and their review or control. This includes fabrics and decorations (zippers, buttons, gaskets, hang tags, hang tags, etc.). Check for defects or defects in the organization. Ideally, 100% of the resulting tissue should be checked before cutting. However, if the fabric is obtained from a reliable source, or the fabric is certified by the fabric manufacturer to be defect-free, only a representative number of samples are tested.

12.5 KEYWORDS

Prominence	the state of being important, famous, or noticeable.
Procurement	1. is the act of obtaining goods or services
Coarse	rough or harsh in texture.
Abruptly	suddenly and unexpectedly.
Kink	a sharp twist or curve in something that is otherwise straight
Baggy	loose and hanging in folds.
Chafe	(concerning a part of the body) make or become sore by rubbing against something.
Bunding	a bund wall is an area within a structure designed to prevent inundation or breaches of various types.

12.6 SOME USEFUL BOOKS

3. The fundamental of quality assurance in the textile industry
4. An introduction to quality control in the apparel industry

Sources of Images

All images are from reference books and the internet.

ANSWER

1 =

Since the apparel industry is driven by fashion, and fashion is constantly changing, manufacturing companies must respond to changing trends. With the development of media such as television and the Internet, today's consumers are more knowledgeable and mature. You have more choices in terms of quality, price, and design. Therefore, clothing chains around the world pay more attention to product quality and provide a large number of fashionable designs. The importance of mass production: Imagine trying to buy a non-standard size shirt. Consumers or users must be present at each purchase to try different brands of different sizes to determine which product suits them best. Even within the same brand and size, the size and size of each item are different, which makes the purchase very slow and difficult. Today, you can buy shirts anywhere in the world, as long as you know the owner's neckline size (38/40/42, etc.). The purchase of clothing ends with the transition from personal (ready-to-wear) clothing to ready-to-wear. Fashion retail depends on the quantity or quantity of products. With the standardization of products and the increasing demand for global brands, local production and research fields have become more and more important. The term "manufacturing" usually refers to a process by which each product can be made into multiple copies using the same process, and it is ensured that each product manufactured is the same in all aspects, also known as "mass production ".

2 =

There is an internationally recognized fabric inspection system to determine how to test a fabric and what is a "qualified" fabric. Depending on size, type, elasticity, etc., the total number of points for a given linear length is increased, and the fabric is "accepted" or "rejected". Some companies adjust their systems to existing systems according to their needs and substance. The special acceptance criteria also depend on the final product manufactured (style, market, function, performance, etc.). In addition, certain tests were conducted to verify the suitability of the fabric for its end-use. Routine testing is performed by each fabric manufacturer or may be specifically required by the purchaser of the final product. These tests include color fastness (light resistance, moisture resistance, sweat resistance, chlorine resistance, etc.), thread count, fabric weight, shrinkage, flamethrower, etc.

After determining the defect and its scope, check the possibility of correction/rework. If the fabric is suitable for sanding, it is sent to the selected process; otherwise, the material will be discarded. If the spread is not very large, that is, it will not affect a large area of the organization, some errors can be accepted. Sometimes resolved. If the cost and/or time required to reprocess the material is too high to be included in the order value, you can try to accept the defective material. Fabric inspection is

one of the most important steps in the manufacturing process because it determines the final quality of the product. The raw material cost of any garment is around 70%, and 90% or more of it is in the fabric. This process is not done well, this is the cost of the fabric. Clothing will increase, leading to reduced profits, and in some cases, losses.
Fabric/material laying and cutting: The next step in garment manufacturing is the planning and processing of fabric cutting.

3 .The length of the layer is determined by the mark. The fabric layers are connected in pairs along the long sides and have the same length. The fabric can be spread by hand or by a machine called a spreader. These machines can be mechanical or electrical. The final product of the electronic or computer-controlled coating process is called coating. The layer height also affects the cutting equipment used. When preparing a layer, make sure that each layer contains only one fabric.
mark: On the top layer, a pattern is applied according to a given mark. In some cases, a computer-printed mark on a sheet of paper, the width of the fabric can be used as a covering for this layer. It is cut from multiple layers of fabric.

Cutting: Simultaneous cutting of layers on a machine that can be manually or computer-controlled. There are different types of machines such as straight knives, round knives, belt knives, and punching machines. The layer height, that is, the number of layers per layer, depends on the type of cutting equipment and the dimensional stability of the tissue. Each type of cutting equipment has its advantages and disadvantages, such as straight blades. This machine is the most readily available and cheapest cutting equipment on the market; however, it is not the best choice for cutting stretch fabrics or knitted fabrics because it does not have a handle to control the dimensional stability of the fabric during cutting. Cutting devices for cutting one layer are usually sold on the market because scissors cannot cut multiple layers with high precision; it also requires more time and effort than in production.

MCQ ANSWER
(C) Cutting
(B) Marker

UNIT :13

SAFETY PRECAUTION IN APPAREL INDUSTRIES

: STRUCTURE:

13.0 OBJECTIVES

- To understand about risk and difficulties in apparel industries
- To learn about safety factors in apparel industries
- To understand the process of safety precaution

13.1 INTRODUCTION

Sewing machine operators use different types of equipment in the sewing industry, so it is important to understand the safety and health precautions when using this equipment, although it is also important for management to take important measures to protect operators from potential problems. However, the best way for any sewing machine operator is to be safe and healthy-to understand the various occupational problems associated with operating the sewing machine, as well as occupational diseases and injuries. Operator error, and negligence.

Operators should obtain adequate instructions on the use of all tools and equipment, machinery, and safety measures, and precautions during operation. The operator must follow the basic instructions for operating the machine. Tools and equipment Adequate furniture, adequate ventilation and lighting, and effective emergency safety measures are essential to ensure the safety and health of operators. First aid kits, safety

signs, fire extinguishers, and alarm systems are the most important safety measures.

13.2 RISKS IN APPAREL INDUSTRIES

A risk is a random event that may occur. Once it occurs, it will harm the realization of corporate goals. problems are potions that can harm or harm the target. The possible source of the problem can be described as a risk. The terms risk and difficulty are often used corespondent; however, as far as risk assessment is concerned, these are two distinct terms: risk is any substance that may harm humans and their environment. Risk is defined as the likelihood that someone faces a risk that has a negative impact.

All industries have different types of tools, equipment, and machines. There are always risks in the operation of machines, which can be physical, biological, chemical, mechanical, etc. All operators must understand the risks associated with the industry in which they work. Operators must observe safety regulations when handling tools and machines. Operators must receive special training to avoid these problems causing injury. Operators must take measures to protect themselves from work accidents. Most production units have similar risks in their processes and work areas, so the unit must have appropriate equipment and facilities to avoid these risks. Educators need adequate planning, training, and awareness seminars, where they must be aware of the various risks associated with their equipment. And precautions. All production units, whether in commercial or residential areas, must be suitable and equipped with the necessary equipment, such as fire extinguishers, fire hydrants, emergency exits, emergency lights, alarms, first aid kits, etc.

Operators may encounter many occupational accidents due to processes, equipment, or machinery used in the apparel industry. The main responsibility of the organization is to provide health and safety conditions for operators.

Nature of the risks

All the risks discussed in this section may not be common in the manufacturing sector, but it is important to understand the various risks so that they can be managed when they arise. Operators have various risks and health problems, so it is important to identify and eliminate various risks with the help of appropriate safety measures. Not only the employer, but everyone is responsible for safety and health. As an employee , all people who work in the organization and the environment.There are also backaches, neck stiffness, wrist, and neck problems when sewing.
These problems can be solved through the following tips.

1. Always work in the correct posture.
2. Keep the brace/instrument in a straight position at chest and waist level to avoid prolonged bending of the neck and back.
3. Use palm rest to avoid wrist and wrist strain.
4. Take a short break from prolonged activities, maybe an hour or two later, to relieve back tension.
5. Fire problem
6. They are common in industries that use large amounts of combustible materials (such as cotton, chemicals, etc.). The main reasons for the fire are as follows.
1. The improper operation of fire and smoke alarms in industrial plants
2. The lack of fire and smoke alarm systems in many industries
3. The lack of maintenance of emergency exits or emergency ladders
4. Lack of suitable escape routes or ladders to safe points at every In all industries, fire extinguishers can be used as safety measures.

Biological risk

These are related to the risks of bacteria, viruses, and toxins. They can be caused by dark and humid rooms, suffocation (poor ventilation), unsanitary conditions in bathrooms, animal bites and bites, poisonous plants, etc. Animals.

Chemical risk

Certain chemicals can be problems in the work area. There are many kinds of problems with chemicals. Certain chemicals are harmful when mixed with other chemicals. In the textile and garment industry, chemicals are widely used in printing and dyeing. Textile workers must be careful when handling chemicals. Workers need to know the specific instructions to follow when handling specific chemicals.

Psycho-social risk

This means that the mental and emotional health of employees in the organization may be abnormal, which may include insecurity at work, excessive working hours, lack of enthusiasm for work, and frustration due to not receiving high-quality products Due to quantified production pressure, workplace harassment, and work-life imbalance, this aspect should be treated with caution because it is a sensitive issue. Behavioral therapies, such as continuous consultation, meditation, yoga, participation in entertainment centers, music therapy, or workplace maintenance, can effectively reduce sick leave and low productivity in the workplace.

Risk of electric shock

These are common in the textile industry because they handle textiles, machinery, and other flammable equipment. It is very dangerous for operators to make electrical contact with short-circuited equipment or conductors. Electricity accidents mainly occur when people who are alive but are believed to be dead are working near electrical appliances. Misuse

of equipment and use of faulty electrical equipment can also cause accidents.

13.3 SAFETY PRECAUTION IN APPAREL INDUSTRIES

It is always important for the operator to understand the dangers associated with operating a sewing machine because many injuries are caused by operator error, negligence and diseases and injuries. The operator must be trained in the correct and safe use of the sewing machine. All safety precautions must be followed.
The sewing machine operator must follow these safety instructions when working.

1. When sewing, focus on the machine and the task at hand.
2. When working on exposed moving parts of the machine, guards must be used.
3. Wear goggles and earplugs when operating a high-speed sewing machine.
4. Always wear suitable shoes to avoid injuries to the legs and feet. When the machine is running, the shoes used must not slip off your feet.
5. Before lubricating the sewing machine or replacing parts, turn off the sewing machine.
6. If a cut or other injury occurs, please report it to the team leader immediately. The wound should be cleaned and bandaged.
7. All tools and equipment required for production must conform to the principles of ergonomic design, and operation must not be laborious.
8. Tools should be convenient and easy to use.
9. The working area should be properly designed, with sufficient working space, sufficient working height, and suitable seats.
10. Inappropriate furniture and poor ergonomics can cause serious health problems, such as carpal tunnel syndrome and other musculoskeletal diseases, low back pain, forearm tendinitis, neck pain, etc. Provide adequate support throughout the shift.
12. If ironing pads are frequently used in the sewing system, the air humidity will become very high and the operator may feel uncomfortable.
13. Take a short break to avoid muscle pain.
14. Adequate physical and mental rest to prevent injury.
15. Maintain a correct sitting posture while working. Avoid working in awkward positions.
16. Don't often place your hands above the shoulders. The hands should be placed lower and closer to the body. The wrists, back, and neck should also avoid frequent bending and twisting.
17. The operator must rest adequately. Give your muscles a break during tea/snack breaks, lunch breaks, and weekends by doing things other than daily activities.

Good lighting

Proper lighting in the workplace is critical to productivity. Conversely, insufficient light can cause eye fatigue, fatigue, and headaches, which can lead to poor performance.

Good lighting habits

1. The sewing room/workstation should have sufficient natural light. This can help reduce your utility bills.
2.Workplaces that require more light should be moved closer to windows.
3. Combine natural light and artificial light, and try to adjust the lighting of the work area, such as painting and cutting.
4. The internal color of the wall affects the required lighting. Make sure that the ceiling is as close to the target as possible. Use light colors on the walls.

Benefits

1. High-quality work, less downtime, and high productivity
2. Reduce fatigue and work-related diseases such as itching and eye strain
3. Improve the health of operators, reduce sick leave and increase productivity

Other things to consider :

Chemicals are widely used in various processes in the textile and clothing industry. Dyes, solvents, and other chemicals are used to create various finishes on fabrics. Protect the operator during chemical processing. Since many jobs require careful inspection of fabrics, materials, or clothing, eye protection is essential. Garment operators can prevent eye injuries by wearing appropriate protective covers or goggles on high-speed sewing machines. When using tools or machines, operators must be trained in safe working practices. Some measured values are listed below.

Safety Measure to Prevent Accident with Scissors :

Hand scissors can cause accidents if used improperly. Scissors injuries usually occur when the scissors slip while cutting or trimming. In most cases, the blade will cut the operator's hand and/or finger. Other parts of the body may also be injured.

The following safety precautions should be taken.

1. Use a suitable storage system, such as shelves, drawers, etc., close to the work area, with a convenient height, for storing scissors, blades, etc. after use.
2. Make sure that the position of the light is such that the light shines on the work surface from the left or front for better visibility.
3. It is forbidden to put scissors in your pocket or hand when changing from one job to another.
4. Do not hold the scissors with the sharp side up. If the center screw is loose, do not use it.

spray gun safety precautions :
the spray gun is used to remove stains that may be produced on the fabric during the manufacturing process. Exposure can cause redness and excessive dryness of the skin. Train operators to handle weapons. Spray the cleaning liquid on the cloth, and then use the cloth to clean, do not spray directly on the clothes.

Precautions for ironing :
1. Be careful when using a hot iron, as this may cause serious injury.
2. Check whether the cable is damaged before use.
3. Open the plug and hold it with dry hands.
4. Only place the iron on a heat-resistant surface.
5. When ironing, make sure that the power cord does not touch the soleplate.
6. Select the ironing mode (heating temperature) suitable for ironing the fabric.

Safety and navigation signs :

Signs or symbols are pictures, words, or characters that represent information. It is important to understand the different types of symbols used in the workplace to be able to follow them. There are two types of symbols: safety symbols and navigation symbols. The safety symbol is a symbol used for warning and protection. They are used to indicate the address or location of a particular facility or department.

CHECK YOUR PROGRESS

1. Describe all types of risks in apparel industries.

_____
_____
_____
_____
_____
_____
_____

2. What safety precautions should Sewing Machine Operators follow while working?

_____
_____
_____
_____
_____
_____
_____

3. Write about Safety measures to prevent accidents with scissors.

_____
_____
_____
_____
_____
_____
_____

MULTIPLE CHOICE QUESTIONS

1. The problem associated with respiratory problems, allergies, skin problem, etc., may be caused due to excessive dust.
(g) Physical risk
(h) Chemical risk
(c) Fire risk
(d) Biological risk

2. The feeling of job insecurity, long working hours, lack of enthusiasm towards work, frustration about not being allowed to deliver a quality product due to pressure of quantitative production, harassment at the workplace, and poor work-life balance.
(d) Fire risk
(b) psycho-social risk
(c) Biological risk
(d) Chemical risk

13.4 LET US SUM UP

In this unit, we learned that there are always risks when using machines. They can be physical, biological, chemical, mechanical, etc. All operators must understand the risks associated with the industry in which they operate. Operators must observe safety regulations when handling tools and machines. Operators must receive special training to avoid these problems causing injury. The operator must take preventive measures to prevent accidents during work. Most production units have similar risks in their processes and operations. Therefore, appropriate equipment and facilities must be equipped in the unit to avoid these risks. appropriate planning, training, and awareness workshops are needed to train operators on how to be aware of the various risks associated with their installations. Y Precautions All production units, whether in commercial or residential areas, must be adequate and equipped with the necessary equipment, such as fire extinguishers, fire hydrants, emergency exits, emergency lights, alarms, first aid kits, etc.

13.5 KEYWORDS

Fire-extinguisher	portable or movable apparatus used to put out a small fire by directing onto it a substance that cools the burning material, deprives the flame of oxygen, or interferes with the chemical reactions occurring in the flame.
Adequate:	sufficient for a specific need or requirement adequate time an amount of money adequate to supply their needs also
Hydrants	a fitting in a street or other public place with a nozzle by which a hose may be attached to the water main.
Prohibit	forbid (something) by law, rule, or other authority.
Penetration	the action or process of penetrating something.
Signage	1. signs collectively, especially commercial or public display signs.

13.6 SOME USEFUL BOOKS

1. The fundamental of quality assurance in textile industry
2. An introduction to quality control in apparel industry

ANSWER

1 = Type of risk

All the risks mentioned in this section may not be common in the manufacturing department, but it is important to understand the various risks so that they can be addressed when they arise. The nature of the operator's health risks, so it is important to identify and eliminate different types of risks with the help of appropriate safety measures, not only for the employer but for everyone's safety and well-being-yes. all the people working in the organization, and the environment. There are always risks to human health and safety in the workplace. These may be chemical problems, physical problems, biological problems, etc.

Physical risks often affects many operators in the workplace, such as work-related hearing loss, poor posture, falls, accidents, etc. seam. Machine tools or milling cutters; posture errors, such as changes in the shape of the cervix and bones, may occur when a person has to sit or stand in an incorrect posture for a long time. Accidents and falls are also common causes of industrial accidents and deaths at work. B. Transportation, construction, mining, sanitation, construction, etc.

Some problems related to the physical environment of the workplace are:

1. Respiratory problems, allergies, skin problems, etc. It may be caused by excessive dust. Adequate ventilation, exhaust fans, etc. will help create a clean and dust-free environment.

2.Working in low light and without protective glasses can cause vision problems.

3. Sitting for a long time and uninterrupted visual work can cause vision problems (eye fatigue) and spine problems for the operator. Working long hours in the workplace can cause repetitive fatigue injury (RSI). Sit down and finish the work. Because of back pain, neck stiffness, neck and wrists when sewing.

the following tips to solve these problems.
1. Always work in the correct posture.
2. Keep the support/training device in a straight position level with the chest and wrists to avoid prolonged bending of the neck and back.
3. Use palm rest to avoid wrist and wrist strain.
4. Take a short break from long activities, maybe an hour or two later, to relieve the tension in the back.
Fire risks:
is common in industries that use a lot of flammable materials such as cotton and chemicals. The fire problems are mainly due to the following reasons.
1 Improper operation of fire and smoke detectors in production
2.Many industries lack fire and smoke alarm systems.
3. Emergency exits or emergency ladders are inadequately maintained.
4. Emergency ladders lack suitable escape routes or safe passages. Every industry must be equipped with a fire extinguisher as a safety measure

Biological risks:
These are related to the risks of bacteria, viruses, and toxins, which may come from dark and humid rooms, suffocation (poor ventilation), unsanitary conditions in bathrooms, animal bites, poisonous plant problems, etc., and animal-borne diseases.

Chemical risks:
Certain chemicals may be a problem in the work area. There are many kinds of chemical problems. Certain chemicals are harmful when mixed with other chemicals. In the textile and clothing industries, chemicals are widely used in dyeing. And printing. Textile workers must be careful when handling chemicals. Workers need to know the specific instructions to follow when handling specific chemicals.

Psycho-social risks:
This means that the mental and emotional health of operators in the organization may be abnormal. This can be attributed to insecurity at work, long hours of work, lack of enthusiasm for work, frustration, inability to provide quality products due to quantitative production pressure, harassment in the workplace, and poor work-life balance. Behavioral therapies, such as continuous consultation, meditation, yoga, participation in entertainment centers, music therapy, or occupational

health care, can effectively reduce sick leave and low productivity in the workplace.
Many types of equipment are used in the clothing industry; however, the operator must be instructed to operate correctly and take all safety precautions before starting to work on the equipment. Every operator.

2 =
1. When sewing, always focus on the machine and the task at hand.
2. When working on exposed moving parts of the machine, guards must be used.
3. When using high-speed sewing equipment, please wear safety glasses and earplugs.
4. Always wear suitable shoes to avoid injuries to the legs and feet. When the machine is running, the shoes used must not slip off your feet.
5. Turn off the sewing machine before oiling or replacing parts.
6. If a cut or other injury occurs, please report it to the team leader immediately. Avoid working in awkward or awkward positions.
7. Don't often place your hands above the shoulders. The hands should be placed lower and closer to the body. The wrists, back, and neck should also avoid frequent bending and twisting.
8. The operator must rest adequately. Give your muscles a break during tea/snack breaks, lunch breaks, and weekends by doing things other than daily activities.
3 = If used improperly, hand scissors can cause accidents. Scissors injuries usually occur when the scissors slip while cutting or trimming. In most cases, the blade will cut the operator's hand and/or finger.
The following safety precautions should be taken.
1.Use appropriate storage systems, such as shelves, drawers, etc., to store used scissors, blades, etc. in a highly convenient place near the work area.
2. Make sure that the position of the light is such that the light shines on the work surface from the left or front for better visibility.
3. It is forbidden to put scissors in your pocket or hand when changing from one job to another.
4. Do not hold the scissors with the sharp side up. If the center screw is loose, do not use it.
5. Designate a recycling location for waste paper.
6. Wear safety shoes with sufficient slip resistance and to penetration by scissors or other sharp objects.
7. Do not leave the scissors in the work area, as this will injure the operator and other walking people.
8.Provide a level, non-slip floor to prevent the operator from slipping.
9. Clean the dirt (pronounced "dibry") and other debris on the work surface and floor to avoid falling and tripping.

MCQ ANSWER
(a) Physical risk
(b) Psycho-social risk

UNIT: 14 FACTORY AUDITS AND MONITORING PROCESS

: STRUCTURE:

14.0 OBJECTIVES

- To learn about factory audits
- To Identify different types of audits
- To understand the monitoring process

14.1 INTRODUCTION

Factory audit is a standardized process used by quality managers to determine whether suppliers meet required business standards when providing high-quality products and services. The implementation of regular factory audits includes evaluating the supplier's quality management system and organization, manufacturing process, and safety implementation of factory audits need to measure performance-reliable suppliers need to deliver on time and meet the order quantity. You need to study all the workflows in the production process and track the time it takes to complete the production. Products and evaluate the efficiency of used production machines and systems. You must also measure the quality control within the supplier's existing QMS to ensure that performance is adjusted to a satisfactory level and that effective monitoring procedures support continuous improvement. Factory audits are required because SS requirements and certifications usually also apply

to suppliers, so non-compliance with supplier requirements may put your own business at risk.

Factory Audit Checklist The most important criteria for factory and supplier audits are locations, policies, procedures, and records. Each item must prove that the factory can provide consistent product quality over time or for specific individual products. The most important milestones of the standard factory audit include:

- manufacturer's history
- personnel
- production facilities
- Machinery and equipment
- manufacturing processes and production lines
- internal quality systems such as testing and inspection
- capabilities and Management system
- Environment

Supplier audit is an effective way to check the quality of a particular supplier and the potential risk to the organization before nonconformity becomes a problem. Suppliers maintain product quality and delivery standards at acceptable levels. Supplier's problems may cost the company money or hurt their customers. Effective solutions to supplier quality management, such as supplier audits, are effective methods for the early detection of problems in the production cycle.

Supplier Audit Checklist

The quality of the final product depends in part on the quality of the supplier. The quality audit can identify any non-compliant materials and provide you with an industry-standard compliance plan.

The most important milestones for supplier audits include:

Corporate Law Information

- Banking Information
- Human Resources
- Export Skills
- Order Management

Methods of Supplier Evaluation

Auditing is an important part of the relationship between customers and suppliers. It is used to review and improve the current quality and delivery process and can be used as a core tool for the annual supplier assessment.

You can ensure the creation of an effective QMS, including clear records of optimizing processes, reducing quality-related risks and costs, and customer-supplier interaction, which is beneficial to both suppliers and manufacturers.

First, you need to collect all the information and documents exchanged between you and the provider, and all content needs to be reviewed and evaluated.

14.2 TYPES OF FACTORY AUDITS

1 Production audit
During the audit of the production facility, the auditor determines whether the supplier: can manufacture products according to their company's specifications, eliminate costly failures, and avoid costly (extra) failures after production starts.

Benefits of manufacturing audit
Verify that your supplier’s manufacturing facilities meet the requirements for manufacturing your products Ensure that your company’s procurement guidelines comply with your supplier’s guidelines Identify and reduce risks to quality, operations, and ethical competence Assess management capabilities

2. Ethics audit
Ethics audit helps to redefine social responsibility As all companies are under increasing pressure to assume social responsibility-having a healthy, safe, and ethical working environment and appropriate compensation and work practices -Ethics audit ensures that reasonable working conditions are met. The standards used for ethical factory audits can be customized or based on several different international standards.
Benefits of ethics audits:

- Ensure decent work and human rights in the supply chain
  Help determine compliance with legal requirements
- Prevent unauthorized outsourcing
- Helps to accurately understand ethical compliance
- Establish with suppliers Partnership
- Improve your company’s image and customer loyalty

3. Structural audit
The structural audit is used to analyze the integrity and safety of buildings and structures provided by suppliers. This includes the review of structural integrity, fire protection measures, relevant regulations, and conditions.
Benefits of structured audit

- Provide a safe working environment that helps prevent minor and catastrophic injuries
- Ensure that there is no harm to the health of employees
- Protect your brand image and reputation
- Control legal compliance
- Help accurately understand health

- Prevent supply chain interruption

4. Environmental audit

By monitoring and improving the impact of the supply chain on the environment, industrial environmental auditing helps to assess compliance with local environmental laws and regulations.

Benefits of environmental audit

 Ensure that your company's international principles and requirements are complied with

 Provide the possibility to combine audit results with laboratory tests to fully understand your supplier's environmental performance

 This leads to environmental performance Improve

 Check the compliance environment of local and international security regulations

5. Customs Anti-Terrorism Association (CTPAT) audit

The focus of the CTPAT audit is to improve the security of private companies in the supply chain from the perspective of terrorism. you. C. Customs and Border Protection Agency. Audit procedures are used to evaluate and improve security measures from a physical and virtual perspective.

Benefits of CTPAT

 Improve the security of the supply chain

 Verify compliance and ensure the integrity of the security practices of trading partners in the supply chain

 Improve the security of the U.S. border

6. Food supplier audit

Food supplier audit, Food supplier audits are designed to assess food hygiene and good manufacturing practices, with a focus on food quality and safety, and to ensure that the company complies with appropriate standards.

Benefits of food supplier audits

Demonstrate your commitment to food safety and quality

Increase consumer confidence

Improve operational efficiency

Ensure compliance and market requirements

Why do large companies need manufacturing inspections

Every type of factory inspection is based on Protect your company's image and brand image as the ultimate goal.

They enable independent third-party auditors to objectively evaluate key goals related to safety, ethical operations, compliance with government regulations, compliance with your company's standards, and avoiding costly supply chain disruptions.

14.3 MONITORING PROCESS IN APPAREL INDUSTRIES

Monitoring means observing or controlling. In the context of the workplace, surveillance is the observation of work practices by a person (or people) who work in the workplace during a specified period or frequently according to a set of labor standards. Work and easy access management. And personal. In this case, "frequently" means that deviations from standard behavior are often found at work. The practice supervision referred to in the "Labor Code" refers to observing the workplace under the jurisdiction of the "Labor Code" to determine whether the provisions of the "Labor Code" have been and are being complied with. This can be compared with the terms "inspection" or "audit", which can describe activities that are not continuous or necessarily repetitive.

Examples of workplace supervision include supervision by

(1) a manager with a specific supervisory role often or often in the workplace;
(2) an employee (such as a salesperson) who is assigned a supervisory role in the job;
(3) Government or local government officials assigned to specific workstations for supervision and frequently or frequently appearing at workstations;
(4) Company/brand seller representatives, not necessarily direct employees of the company; but including those who have been appointed (maybe at Personnel performing supervisory functions on behalf of the company on-site or through an accounting firm; o
(5) civil society organizations, such as follow-up non-governmental organizations in Central America.

Also uses terms such as "first time", "second time" and "third-time surveillance", but they often cause confusion. Usually, the company regards itself as the first, the supplier as the second, and the responsible person as the third.

Internal or operational monitoring:

The general term refers to the procedures and practices followed by the company itself (or its employees) to verify that the work always complies with labor standards Including employee training, buyer guidance, and taking appropriate measures in case of violation of the code.

Independent monitoring:

The term independent monitoring is used for many things. It was originally used in the cleaning of clothes movement to describe the process of supervision and implementation by an external or independent organization. This external body will include various participants and ensure the participation of workers and workers' organizations. In Central

America, organizations that claim to be independent of all other parties (companies, trade unions) use the term "independent supervision", for example, B. Specialized NGOs describe their job supervision functions. In the United States, the Fair Labor Association (FLA) currently uses the term "independent external oversight" to refer to the process of reviewing code compliance and evaluating working conditions. This monitoring of the FLA system, procedures, and effectiveness also led to a corrective action plan; CCC and other organizations are very clear that monitoring as a continuous process can never be independent, and the company is increasingly seen as a responsibility. To monitor compliance with its labor standards, today it is more inclined to use the term "review" to describe the (discontinuous) process of monitoring the implementation and inspection of the monitoring process.

CHECK YOUR PROGRESS

3. Describe independent monitoring.

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_____
_____
_____
_____
_____
_____

4. What is a factory audit?

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_____
_____
_____
_____
_____
_____

3. Write about any 2 types of factory audits.

_____
_____
_____
_____
_____
_____
_____

MULTIPLE CHOICE QUESTIONS

1. _____ audits help to ensure social accountability is being reviewed.

(a) Food
(b) Environmental

(c) Ethical
(d) Structural

2. _____ means to watch or check on.
(e) Monitoring
(b) Food supplier audits
(c) Structural audits
(d) Environmental audits

3. Which Terms are often used to refer to the procedures and practices a company itself carries out to check that labor standards have been implemented and are continuously observed in the workplace?
(a) Food supplier audits
(b) Environmental audits
(c) Independent monitoring
(d) Internal monitoring

14.4 LET US SUM UP

In this unit, we learned about the definition of factory audit and monitoring process, we also studied factory audit, which is the general concept of how factories operate and how to guarantee the production of quality products you can see their capabilities on many goods. This test only affects specific batches. In addition, audits can ensure that the factory meets established health and safety, child labor, working hours, and management standards. Professional visits to factories to conduct these audits can help you make more informed purchasing decisions. However, the inspection is usually carried out with the factory with which you have established a relationship. In short, an audit can help you make long-term decisions and decide which suppliers to work with to get the best results. It is also important to combine inspections and audits in your quality control plan.

14.5 KEYWORDS

Disruption	disturbance or problems which interrupt an event, activity, or process.
Integrity	the quality of being honest and having strong moral principles.
Catastrophic	involving or causing sudden great damage or suffering
Demonstrate	give a practical exhibition and explanation of (how a machine, skill, or craftwork or is performed
Unobstructed	clear or free from obstructions or obstacles

14.6 SOME USEFUL BOOKS

5. The fundamental of quality assurance in textile industry
6. An introduction to quality control in apparel industry

https://www.textilestudent.com/safety-in-garments-industry/

ANSWER

1 = Independent monitoring:

The term independent monitoring is used for many things. It was originally used in the cleaning of clothes movement to describe the process by which an external or independent organization is responsible for monitoring and implementing it. This external body will include various participants and ensure the participation of workers and workers' organizations. In Central America, organizations that claim to be independent of all other parties (companies, labor unions) use the term "independent oversight", for example, B. Specialized NGOs describe the existing job oversight functions in the United States: Fair Labor Association (FLA) currently The term "independent third-party monitoring" is used to refer to the process of verifying compliance with this Code and assessing working conditions. The effectiveness of FLA also facilitates the development of corrective action plans. CCC and other organizations generally recognize that monitoring as a continuous process can never be independent, and as companies are increasingly seen as responsible for monitoring compliance with labor standards.

2 Factory audit is a standardized process used by quality managers to determine whether suppliers meet required business standards when providing high-quality products and services. Including the evaluation of the supplier's quality management system and QMS, its organization, production process, and safety measures compliance. Factory audits need to measure performance: reliable suppliers need to deliver products on time and delivery time, and you need to review everything in the production process Workflow, tracking time spent. Manufacture the finished product and evaluate the efficiency of the production machinery and equipment used. You must also measure the quality control within the supplier's existing QMS to ensure that performance is adjusted to a satisfactory level and that effective monitoring procedures support continuous improvement. delivery. The failure of a supplier puts your own business at risk.

3 =

1. Production audit

During the audit of the production facility, the auditor determines whether the supplier can manufacture products that meet their company specifications, correct costly failures, and avoid costly (additional) failures after the start of production

Benefits of manufacturing audits

 Verify that your supplier’s manufacturing facilities meet the requirements for manufacturing your products
 Ensure that your company’s procurement guidelines are consistent with your supplier’s guidelines
 Identify and reduce quality, operations, and ethics Risks incompetence
 Assess competence

2 Ethics audit
Ethics audit helps to redefine social responsibility. As all companies assume social responsibility to provide a healthy, safe, and ethical working environment, as well as reliable work practices and remuneration, the pressure on Coming bigger-ethical audits ensures that the correct working conditions are met... The standards of ethical factory audits can be customer-specific or based on various international standards.
Benefits of ethics audits:
 Ensure decent work and human rights in the supply chain
 Help comply with legal requirements
 Prevent unauthorized outsourcing
 Contribute to an accurate understanding of ethical compliance
 Establish partnerships with suppliers
Improve your company's brand image and customer loyalty

MCQ ANSWER
(C) Ethical
(a) Monitoring
(e) Internal monitoring

યુનિવર્સિટી ગીત

સ્વાધ્યાયઃ પરમં તપઃ
સ્વાધ્યાયઃ પરમં તપઃ
સ્વાધ્યાયઃ પરમં તપઃ

શિક્ષણ, સંસ્કૃતિ, સદ્ભાવ, દિવ્યબોધનું ધામ,
ડૉ. બાબાસાહેબ આંબેડકર ઓપન યુનિવર્સિટી નામ;
સૌને સૌની પાંખ મળે ને સૌને સૌનું આભ,
દશે દિશામાં સ્મિત વહે, હો દશે દિશે શુભ-લાભ.

અભણ રહી અજ્ઞાનના શાને, અંધકારને પીવો ?
કહે બુદ્ધ આંબેડકર કહે, તું થા તારો દીવો;
શારદીય અજવાળાં પહોંચ્યાં ગુર્જર ગામે ગામ
ધ્રુવતારકની જેમ ઝળહળે એકલવ્યની શાન.

સરસ્વતીના મયુર તમારે ફળિયે આવી ગહેકે
અંધકારને હડસેલીને ઉજાસનાં ફૂલ મહેંકે;
બંધન નહીં કો' સ્થાન સમયનાં જવું ન ઘરથી દૂર,
ઘર આવી મા હરે શારદા દૈન્યતિમિરનાં પૂર.

સંસ્કારોની સુગંધ મહેંકે,મન મંદિરને ધામે
સુખની ટપાલ પહોંચે સૌને પોતાને સરનામે;
સમાજ કેરે દરિયે હાંકી શિક્ષણ કેરું વહાણ,
આવો કરીએ આપણ સૌ
ભવ્ય રાષ્ટ્રનિર્માણ...
દિવ્ય રાષ્ટ્રનિર્માણ...
ભવ્ય રાષ્ટ્રનિર્માણ

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