APPAREL QUALITY ASSUARANCE

APPAREL – CLOTHING

QUALITY- The standard of something as measured against other things of a similar kind; the degree of excellence of something.

ASSURANCE- A positive declaration intended to give confidence; a promise.

UNIT 1

- Introduction to quality control
- Definition of quality,
- Importance of quality assurance,
- Fabric inspection,
- IPQC
- AQL
- MIL standards and final inspection

INTRODUCTION TO QUALITY CONTROL

WHAT IS QUALITY CONTROL IN APPAREL INDUSTRY?

- Quality is of prime importance in any aspect of business. Customers demand and expect value for money. As producers of apparel there must be a constant endeavour to produce work of good quality.

- The systems required for programming and coordinating the efforts of the various groups in an organization to maintain the requisite quality". As such Quality Control is seen as the agent of Quality Assurance or Total Quality Control.

WHAT IS QUALITY CONTROL IN APPAREL INDUSTRY?

- In the garment industry quality control is practiced right from the initial stage of sourcing raw materials to the stage of final finished garment.

- For textile and apparel industry product quality is calculated in terms of quality and standard of fibres, yarns, fabric construction, colour fastness, surface designs and the final finished garment products.

- However quality expectations for export are related to the type of customer segments and the retail outlets.

INTRODUCTION TO QUALITY CONTROL

- According to quality guru's juran and deming "quality control is the regulatory process through which we measure actual quality performance, compare it with quality goals and act on the differences".

- Quality guru juran is the one who helped and played an important role in rebuilding japan after hiroshima and nagasaki were destroyed were destroyed by nuclear bombing during second world war.

INTRODUCTION TO QUALITY CONTROL

- Quality control requires an understanding of resources like man power, materials, machines and methods.

- When one looks at the definition of quality control one can easily understand that is predominantly a corrective action so quality control will give a temporary solution for a permanent problem.

- So as if one follow only this concept the system will end up doing more often fire fighting exercise.

INTRODUCTION TO QUALITY CONTROL

- Because quality control enables one to inspect the quality of the product. But quality cannot be inspected into a product but has to be built into the product, when the product is being developed into the product.

- But quality control does not facilitates the quality being developed into the product but it does the function of checking whether the product has required specifications or not.

QUALITY

DEFINITION OF QUALITY

- A product or service is said to have quality if it has performance, durability, reliability, reparability etc..

- Quality can also mean the absence of variation in its broadest sense.

- Quality can also mean meeting or exceeding customer expectations all the time, thus quality can also be defined as the ability to exceed a customers expectations while maintaining a cost competitive market position.

- Quality is fitness to use.

IMPORTANCE OF QUALITY ASSUSRANCE

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- The quality assurance is defined as follows "All the planned or systematic actions necessary to provide adequate confidence that a product or service will satisfy given requirements for quality".

- Basically quality assurance is a trouble shooter it arrests and rectifies the problem in the beginning only. In case of quality control the problem may be allowed to happen and then it is corrected, where as with quality assurance is enough.

IMPORTANCE OF QUALITY ASSUSRANCE

- Precautions are taken that the problem is arrested in the beginning only and care is taken to see that the very root cause of the problem is rectified in the beginning only.

- Thus the quality assurance in force there will not be any production of seconds or inferior quality goods where as with quality control in force there are chances that some seconds or inferior quality products may be produced.

ILLUSTRTION OF DIFFRENCE BETWEEN QUALITY CONTROL AND QUALITY ASSURANCE

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PROBLEM:

Dealing with skipped stitches or broken stitches caused due to improper thread tension.

ILLUSTRTION OF DIFFRENCE BETWEEN QUALITY CONTROL AND QUALITY ASSURANCE

QUALITY CONTROL:-

Rip open the seam, adjust the tension on that particular sewing machine and stitch the seam. This is the way how the problem is handled in case of quality control.

ILLUSTRTION OF DIFFRENCE BETWEEN QUALITY CONTROL AND QUALITY ASSURANCE

QUALITY ASSURANCE:-

The same problem is handled in the following way in case of quality assurance. During sampling stage only the correct tension of the thread to make a perfect seam is set and thread tension is measured and same tension is set on all the sewing machines in pilot run and mass production, thus no room is given for any production of seconds goods in the case of quality assurance.

FABRIC INSPECTION

FABRIC INSPECTION

- After the fabric is received, it should be inspected to determine to acceptability from a quality point of view: otherwise extra cost in garment manufacturing may be incurred due to either the loss of material or time, to say nothing of customer returns and dissatisfaction due to poor quality.

- Some garment manufacturer rely on their fabric suppliers to perform fabric inspection and mark fabric defects either way, fabric inspection prior too spreading will remove the burden of quality responsibilty from those performing the spreading and cutting operation.

FABRIC INSPECTION

- A spreader and cutter can concentrate onto their work if fabric is already inspected and their productivity will increase.

- Regardless of what practice is followed the important point is that the fabric should be inspected before cutting, the defects are marked and the patterns cut around the defects so as not to include them in the finished garment.

FABRIC INSPECTION

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

- Defects in the fabric can be seen readily with these machines as the inspector has a very good view of the fabric and the fabric does not need to be reversed to detect defects.

FABRIC INSPECTION

- These inspection machines are power driven. The defects are located, marked and recorded in an inspection form. Such machines are also equipped to accurately measure the length of each roll of fabric as well as monitor the width of the fabric.

- The width of the faric is very critical to the cost of manufacturing but it is even more critical to the manufacturer of basic garments which are produced in bulk and consume a lot of material.

FABRIC INSPECTION

There are various fabric inspection systems are listed below:-

- 4 point system

- 10 point system

- Graniteville 78 system

- Dallas system

4- point system

- The 4 point system is also called as American apparel manufacturers association (AAMA) point grading system for determining the fabric quality, is widely used for the producers of apparel fabrics & by the department of defence in US.

- Maximum defect points allocated per linear yard length are 4 irrespective of the number of defects.

4- point system

Size of Defect	**PenaltyPoints**
Length of defects in fabric (either length or width)	
Defects up to 3 inches	1
Defects > 3 inches ≤ 6 inches	2
Defects > 6 inches ≤ 9 inches	3
Defects > 9 inches	4
Holes and openings(largest dimension)	
1 inch or less	2
Over 1 inch	4

CALCULATION OF TOTAL POINTS PER YARDS

- In 4 point system fabric quality is evaluated by unit **points/100 sq. yds**.

- Points / 100 sq. yd. = (Total points in roll * 36 * 100)/ (Fabric length in yards * Fabric width in inches)
Normally fabric roll containing 40 points per 100 square yard are acceptable.

EXAMPLE

- A fabric roll 120 yards long and 46 inch wide contains following defects.

4 defects up to 3 inch length 3 defects from 3 to 6 inch length 2 defects from 6 to 9 inch length 1 defect over 9 inch length 1 hole over 1 inch	4 x 1 3 X 2 2 X 3 1 X 4 1 X 4	4 points 6 points 6 points 4 points 4 points
Total defect points		24 Points
Therefore, Points/ 100 sq. yards	= (24 X 3600)/(120 X 46) = 15.652 points	

ACCEPTANCE CRITERIA

So if the acceptance criteria are 40 points/100 yard square then the roll is acceptable.

CHECK SHEET OR INSPECTION FORMAT

- To record or to collects defects during inspection you must use a simple check sheet.

- A check sheet includes general details, details of fabric lot, fabric defects according their sizes, summary of fabric defects, quantity inspected and total penalty points and result of the fabric lot after inspection.

- Use tally marking for recording of number of defects. A sample 4 point system fabric inspection format has been attached at the bottom.

INSPECTION FORMAT

Sample 4 Point System Inspection Format

Fabric Description		Supplier Name		Fabric Received Date		Checker:	
Colour		Process Type		Total Fabric Rcvd.		Date:	

S.No.	Lot No.	Length (yds)		Width (in inches)		Defect Categories																		Total Points Found	Points per hundred sq. yards	Status & Remarks
						Defect-1				Defect -2				Defect -2				Hole		Others						
		On Tag	Actual	On Tag	Actual	0-3"	3"-6"	6"-9"	> 9"	0-3"	3"-6"	6"-9"	> 9"	0-3"	3"-6"	6"-9"	> 9"	0-1"	Above 1"	0-3"	3"-6"	6"-9"	> 9"			
						1	2	3	4	1	2	3	4	1	2	3	4	2	4	1	2	3	4			
	Total																									

Signature of the Quality Manager

Signature of the Checker

10 POINT SYSTEM

- For production of high quality garments, need high quality piece goods. It is an universal truth. When a sewing factory receives fabric from the mill, it is difficult to conduct a full 100% inspection of the fabric. So then minimum 10% inspection of all piece goods prior to spreading the fabric.

- There are several methods of fabric inspection in garments industry. Ten Points system is one of them.

10 POINT SYSTEM

- The 10 point method is a point per fault system, which gives a measurable guide to quality grading per roll. In 1955s "Ten Points" piece goods evaluation was adapted by the Textile Distributors and National Federation of Textiles.

- The system assigns penalty points to each defect as per following guideline.

10 POINT SYSTEM

a) Warp defects

Upto 1"= 1 point

1"to 5" length defect = 3 points

5"to 10" length defect = 5 points

10"to 36" length defect = 10 points

10 POINT SYSTEM

b) For filling or weft way defects

Holes upto 1"= 1 points

From 1"to 5" = 3 points

From 5" upto ½ width of the fabric = 5 points

From ½ width upto ¾ width of the fabric = 10 points

10 POINT SYSTEM

Note: Maximum number of defect points allocated per linear yard length are 10 points.

WORKING PROCEDURE

- Under the 10 Points system, a piece is graded as "First", if the total penalty points do not exceed the total yardage of the piece.

- In case of a fabric wider than 50 inches; "First" quality is considered if the total defect points do not exceed the total yardage of the fabric.

- A piece is graded as "Second" if the total penalty points exceed the total yardage of the piece.

ACCEPTANCE CRITERIA

- ACCEPT if the number of defects are less than number of yards square inspected.

- REJECT if the number of defects points are more than no of yards square inspected.

IN PROCESS QUALITY CONTROL (IPQC)

IN PROCESS QUALITY CONTROL

- In process quality control done by employing in process inspection.

- In process inspection means the inspection of parts before they are reassembled into a complete product and any defect found in the garment parts is rectified and then they are assembled into a complete product.

- In apparel manufacturing, this means inspection at various points in the entire manufacturing process from spreading fabric to pressing/finishing.

IN PROCESS QUALITY CONTROL

- The idea behind in process inspection is to inspect or check the quality of component parts are done to manufacturing as possible and thereby identify the source of quality problems are early in the manufacturing process as possible.

- Thus in process quality control is achieved by employing in process quality control and it is designed to uncover deficiencies in workmanship as well as equipment malfunction.

- In process inspection can be performed by either the quality control inspectors or individual operators themselves after they perform respective operations, but it is usual to employ checking stations in between and the quality control inspectors, check the parts at these stations.

- They may check each operators sewn product at random also. Also quality checkers do checking at checking stations each and every part done.

- This will result in minimising the need for later repairs and rework. Each production operation performed correctly makes for a smooth running plant with low operating costs. Poor quality at any stage in production compounds itself and can be expected to increase total cost.
- A well run in process quality control programme will result in the following two advantages
- Reduction of major "seconds "from the customers due to bad quality.
- Decrease in labour cost due to a decrease in repair rates.

ACCEPTABLE QUALITY LEVEL (AQL)

ACCEPTANCE QUALITY LEVEL (AQL)

- AQL is a statistical sampling which also known as acceptance sampling.

- This inspection alternatively also provides a compromise between 100% inspection and no inspection at all.

- AQL is defined as the maximum per cent defective that for the purpose of sampling inspection can be considered satisfactory as a process average.

ACCEPTANCE QUALITY LEVEL (AQL)

- The advantage with statistical sampling is that shipments or lots are not over inspected; small shipments or lots are not under inspected and most important the risks of making a wrong decision (such as accepting a defective lot or rejecting a good lot) are known and controllable.

- This is usually the most practical and economical means of determining the product quality.

ACCEPTANCE QUALITY LEVEL (AQL)

- When the customer designates some specific value of AQL for a certain defect or group of defects, he indicates to the supplier that his (the customers) acceptance sampling plan will accept the great majority of the lots or batches that the supplier submits, provided the process average level of per cents defective is there lots or batches is no greater than the designated value of AQL.

ACCEPTANCE QUALITY LEVEL (AQL)

- Thus AQL is a designated value of per cent defective that the customer indicates will be accepted most of the time by the acceptance sampling procedures to be used.

% defective = $\dfrac{\text{Number of defective units}}{\text{Number of units inspected}}$ x 100

ACCEPTANCE QUALITY LEVEL (AQL)

- AQL is generally expressed in %.

- The AQL's most widely used in apparel industry are 2.5, 4.0, 6.5 & 10.0 depending on the price and item.

- For example, the low price items and childrens wear AQL's of 6.5 and 10.0 maybe quite appropriate, however for higher price items AQL of 2.5 and 4 may be appropriate.

MIL STANDARDS (MILITARY STANDARD 105E)

- These standards are used by various military organizations.

- The Indian military organizations and American military organizations use this.

- This is also called a statistical sampling method.

- With the sampling method large shipments or lots are not over inspected