



DAFFODIL INTERNATIONAL UNIVERSITY
Faculty of Engineering

Department of Textile Engineering

STUDY ON QUALITY MANAGEMENT SYSTEM AND TECHNICAL
SOLUTION OF DEFECTS IN LINGERIE UNIT.

Submitted

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This Report Presented in Partial Fulfillment of the Requirements for the
Degree of Bachelor of Science in Textile Engineering

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DECLARATION

I hereby declare that, this project has been done by me under the supervision of Abdullah Al Mamun (Faculty), Department of Textile Engineering, Daffodil International University & Mostainur Raihan (Industry), Operation Manager, SQ Birichina Ltd. I also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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Especially I would like to express my sincere gratitude & appreciation to my official boss Md. Rokonuzzaman, Production Manager, SQ Birichina Ltd. for his enormous support.

Finally, I must acknowledge with due respect the constant support and patients of my Parents.

ABSTRACT

This project is on “Study on Defect analysis and technical solution of defects in lingerie Production”. Lingerie manufacturing is quite different from any other conventional manufacturing even different from another product of garments industry. For lingerie it's needs various types of raw materials. Each style is different product that requires different type of fabric, color, buttons, thread, etc. Hence requirement of product integrity at every stage requires detailed knowledge about the quality parameters, quality problems, their causes and remedies. For quality production it is better to know the complete process of garment making (selection of yarn, fabric production and garment manufacturing) so that quality level can be improved.

Quality product is the best and for better quality it needed to remove defects. In garments industry quality means, Garments are free from all kind of faults and defects. Quality may be defined as the level of acceptance of a goods or services. For the textile and apparel industry, product quality is calculated in terms of quality and standard of fibers, yarns, fabric construction, color fastness, designs and the final finished garments.

Different garments factory follow different quality control and management systems especially different inspection systems for garment inspection (i.e. 4point system, 10 point system, AQL etc.). All the system and technique is for identify faults and defects. If we can ensure the defect and faults free fabric and garments then we will get the quality products. So quality depends on identify and solution of faults and defects.

In this project I will discuss about the superior quality by reducing faults and defects. What types of fault and defect occurred in lingerie production and how it can be remove or reduce in tolerance point by technical and engineering method.

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01

INTRODUCTION

1

1.1 Introduction

The garments manufacturing industry is a large and most export oriented field of Bangladesh in terms of output, export and employment. At present these manufacturing industries are earning foreign currency about three quarters of total exports and the industry is a symbol of the country's dynamism in the world economy. Manufacturing cost of a garments products partially depend on quality inspection cost. The survival competition in term of manufacturing cost versus selling price of these fields is increasing day by day in competitive global market. As knitwear industry is labor incentive field so there is little chance to improve these field by technological change rather there are vast scopes of improvement of these areas by applying various scientific approach. It is noted that in comparative market quality always gets priority. So all most every industry try to ensure maximum quality by using quality control system.

As this Industry is a symbol of the country's economy and there are ample opportunities to improve this field so the authors feel great interest to work this area. By removing faults and defects best quality can achieve.

In knitwear garments lingerie production is increasing day by day in Bangladesh. It has a great opportunity in Bangladesh to reach the world market. In comparative business market if anyone wants to be superior, must have to be superior in quality.

Obviously the core of a successful business is good products. Lingerie has a selection of really lovely top quality products which are made from luxurious silks, chiffons and lace.

1.2 Background of the study

In garments industry quality is a vital issue. Some buyers and consumers requirement is quality first. Quality is like blood of human body. If the product has no required quality normally it will lose market ability. If we want to do global business we have to maintain a standard quality.

Someone thinks that Bangladesh only made low grade product. This is low quality. But now a day we are producing standard quality product. If we want to ensure or secure our position in global business market we have to maintain a standard quality.

Traditional quality management system is not enough for this purpose. By observing this reality I tried to work in this sector for better quality management system and also analysis the defects and it's solution as well as. I specially do this project for lingerie production which has a great scope in our country. So that by proper quality management system we can expand our lingerie unit in Bangladesh.

There are many article thesis and project regarding quality management system. In 1998 LORRAINE MONTFORD write a thesis paper for his master's degree program on quality management system and supplier development. Central to the concept of T.O.M. is the nature of the relationships which organizations develop with their suppliers. As organizations improve their own internal efficiency there becomes a need to look externally to their suppliers in order to seek competitive advantage. Previous work on supplier development has focused mainly on the automotive industry. based primarily quality management systems and supplier relationships which have been developed at J. Barbour and Sons Ltd, an international clothing company whose name is synonymous with Quality. The research indicates that the organizational structure and culture of companies within the U.K. does not readily support all the principles of T.O.M. More evidence needs to be sought regarding the benefits to the organization. Characteristics associated with various types of supplier relationships are defined i.e. traditional and partnership. Dependent upon the type of product supplied and by whom, organizations may wish to develop their suppliers to a greater or lesser degree. As a result of the research, recommendations are then given for organizations implementing T.O.M. or Supplier Development programmers in order to improve the quality of their goods or services.

In this thesis there is discussion about quality management and supplier relationship development. But there was no any kind of direction about any proper quality control or management system and there was no any technical system for reducing defects or how to achieve better quality.

In another article Nurul Zunaidi student of international Islamic university of Malaysia write about the quality management system of H&M buyers. She wrote about the total quality management process of H&M. What kind of quality they want and how they maintain it. But there is no any kind of information about the quality management or development of product.

In International Journal of Arts and Commerce, Santis, Sandra Helena da Silva de, Marcicano, JoãoPaulo Pereira Prof. Doutor, Scopinho, Carlos Eduardo Dezan write about Evaluating the implementation of quality system in a small textile industry of knitting

This study was conducted a small textile industry and aims to assess and investigate the practices used in the implementation of quality management systems and tools to ensure process improvement. The purpose, therefore, is to implement the quality system and also analyze the management practices and tools used to ensure quality, comparing practices and showing the results in productivity and product quality. The research was conducted through a case study; we intend to analyze the reality of the organization in making the visit on-site observation. A case study can thus elucidate a number of issues on the development of quality in the textile industry of small, checking possible kinds of inefficiency or improvement points unexplored. To verify that the controls of the company to support the implementation of quality management system were conducted evaluation, analysis, testing and monitoring in all sectors.

But here also there is no direct indication about product quality or analysis. Here is only given some data how to increase product and productivity.

In 2007 Universitatea “Lucian Blaga” din Sibiu Facultatea de Științe Agricole, Industria Alimentară și Protecția Mediului write an article about quality assurance system and give many mathematical and statistical data. But here also no technical data of quality analysis or how to minimize the defect or about standard quality system.

In a project AFROZA SULTANA PINKY, student of Daffodil International University write about the quality management of knit garments industry. In her thesis she writes about the total conventional management system of quality. The good thing of her thesis is that she directly write about the product quality, how to inspection and maintain quality system. But here also no technical technique or system or any analysis for superior quality.

There are also lots of article about quality and quality management system. But in my thesis I will going to introduce some new technique, technical management system, defect analysis, technical solution of this defect and finally by proper quality management how to produce a superior quality product. This is the main difference of my project from the others.

1.3 Objectives of the study

- To know about proper quality management system.
- To know the types of quality management.
- To know the technical method of quality measurement.
- To create new method of quality control.
- To know about defects of garments.
- How to make solution for defect product.
- Technical solution for remove or reducing defect.
- To know about total quality management process of garments industry.

1.3 Significance of this study

The main significance of this study is to create a new technical, technological, analysis based and solution based quality management system. This is especially for lingerie product. The lingerie unit is growth oriented knit garments in our country. So it has a lot of chance to be the leading position in global garments business.

1.4 Scope of the study

I think this study has a great scope to implement in textile industry. By this system proper quality must be maintained. Here there are many techniques and methods are provided which is so much necessary and different from any other conventional method. Here I will introduce some new technique and method by which a superior quality product can be produced.

1.5 Limitation

Basically this project is done by directly working on textile sectors. So the technique, method and ideas are totally implementable. It may be little limitation on the solution of defects. Because total defect can't be removed. It can reduce in a tolerance value. May be some limitation of proper technology.

02

LITERATURE REVIEW

6

2. Literature review

There are many data and discussion about quality management system. AFROZA SULTANA PINKY gave a discussion on her thesis about quality management system. Which is shortly given bellow quality Management System in the garments industry:

A number of systems, measures & techniques are used so that only quality goods are produced in the first place and defects do not originate at all. If they occur at all, there must be corrective action so that they are eliminated in the preliminary stage and would not reappear. QMS generally employs the following measures, techniques that ensure that only quality good are produced:

- ✓ Inspect all incoming, in process & final goods to ensure quality of goods.
- ✓ Ensure that all patterns & grading of patterns are okay.
- ✓ Inspect marker and check if it is okay and within consumption.
- ✓ Inspect spreading, cutting & numbering.
- ✓ Ensure if relaxation time was given to knit fabric.
- ✓ Install in line inspector in the sewing lines.
- ✓ Install Traffic Light Chart system or other system to monitor quality in production Line.
- ✓ Inspect 100% goods delivered from sewing lines.
- ✓ Inspect the table quality passed garments with Statistical Technique.
- ✓ Control reject goods so that they do not mix-up with quality passed goods.
- ✓ Control repairable goods, washable goods so that they can be double checked to ensure quality.
- ✓ Inspect goods with right equipment's and in right conditions.
- ✓ Inspect ironing, folding.
- ✓ Make repeat inspection of garments prior to poly bagging.
- ✓ Inspect poly bagging & assortment.
- ✓ Final table inspection in conducted prior to shipment of goods.
- ✓ Impart training QA personnel so that they can easily identify defects & understand the causes of defects.
- ✓ Impart training QA personnel on Statistical Methods.
- ✓ Make continuous improvement plans & implement them.

Quality management system by textile learner blogs

1. On- line quality control system
2. Of line quality control system

On Line Quality control System:

This type of quality control is carried out without stopping the production process. During the running of production process a set up is automatically performs and detect the fault and also takes corrective action.

Online quality control comprises with the raw material quality control and the process control.

Raw Material Control :

As the quality product depends on the raw material quality so we must be provided with the best quality raw material with an economical consideration. The fabric must be without fault, with proper absorbency, whiteness as per requirement of the subsequent process. The Grey inspection report gives the condition of the raw fabric.

Process Control :

The method chosen for the process must be provided with the necessary accurate parameters. Here the specific gravity, water level, residual hydrogen per oxide etc. at each stage is checked.

Laboratory :

Lab is the head of the textile industries. Higher precision lab can aid easily to achieve the goal of the organization. Before bulk production a sample for the approval from industry is sent to the buyer. As per the requirement of the buyer the shade is prepared in a lab considering the economical aspects.

Lab Line:

- 1. Standard sample:** The buyer to the industry gives the standard sample. The sample is measured by the CCM to get the recipe.
- 2. Lab trial:** Getting the recipe the lab officer produce lab trial and match with standard according to buyer requirement. Lab trial is made by the AHIBA dyeing machine. There are some programs for dyeing. The programs are given below.

Off line Quality Control System:

Performed in the laboratory and other production area by stopping the production process

consisting of fabric inspection and laboratory and other test. Correction steps are taken according to the test result.

Off-Line Tests: All the Off-Line tests for finished fabrics can be grouped as follows:

A. Physical tests

B. Chemical tests

Physical Tests:

1. GSM test
2. Shrinkage test
3. Spirality test
4. Tensile strength
5. Abrasion resistance
6. Pilling resistance
7. Button Strength Testing
8. Crease resistance
9. Dimensional stability
10. Bursting strength test

Chemical Tests:

1. Color Fastness to washing.
2. Color Fastness to light.
3. Color Fastness to heat.
4. Color Fastness to Chlorinated water.
5. Color Fastness to water spotting.
6. Color Fastness to perspiration.
7. Color Fastness to Seawater.
8. Fibre analysis.
9. PH test.
10. Repellency.

03
METHODOLOGY

Materials & Method:

In a garments industry the quality control is start from store section. I means during the in house time of fabric and accessories.

3.1 Accessories Inspection:

- ✓ Proper inventory
- ✓ Required measurement
- ✓ Required quality
- ✓ Check country, color, safety label
- ✓ Check price tag, hang tag
- ✓ Nickel test
- ✓ etc

Nickel Test



For all Metal Accessories like

- ✓ Zipper
- ✓ Button
- ✓ Fly
- ✓ Rivet
- ✓ etc

Chemical used in nickel test- Ammonia & Dimethyl Glyoxime

Result:

After brushing the accessories by cotton bar with Ammonia & Dimethyl Glyoxime, if the accessories color change to pink. It's indicating the presence of nickel and then it will be rejected. If color doesn't change, then it's ok.

After passing nickel test then 10% of accessories are inspected by QC inspector. If the defectives amounts cross over 1% then the accessories will fail. In the situation according to suggestion of QA & QC manager these accessories send to the merchandiser and buyer representatives finally to work according to their decision.

3.2 Fabric Inspection:

Fabric inspections are three types:

- Such as -
- a) Four point system
 - b) Ten point system
 - c) Graniteville system/78 method

Among them 4 point system is mostly used.

Four point system:

Defects	Point
0 to 3 inch	1
3 to 6 inch	2
6 to 9 inch	3
Over 9 inch	4

- ✓ 10% fabric is inspected. If it's failed then 15% then 30% and then 100% fabric is inspected.
- ✓ If the amount of fabric is less than 1000m then 100% fabric is inspected.

- ✓ Accepted point is different to types of fiber and buyer. Like H&M, Zara, Pull & Bear are accepted up to 20 points.
- ✓ Fabric hole is directly counted as 4 point.
- ❖ For one yard faulty fabric highest point is 4.
- ❖ Slab, Spot, Sundry faults, Foreign yarn, Naps for each 1 point.
- ❖ Weft bar, Shade bar, Hole, Check missing for 4 point.
- ❖ Missing yarn, Thick yarn for each 2/3/4 point.

Fabric Inspection Formula:

$$\text{Per 100 square yards} = \frac{\text{Counted point} \times 36}{\text{Inspectional fabric length} \times \text{Fabric width}} \times 100$$

Less than 28 points/100 square yards	Fabric acceptable
Above 28 points/ 100 square yards	Fabric rejects.

- If any fabric rolls cross over 40 points then the fabric roll directly is rejected

3.3 Cutting Inspection:

- ✓ Check cut pieces body quality
- ✓ Check style
- ✓ Check size
- ✓ Check color
- ✓ Check required measurement
- ✓ etc

3.4 Sewing Line Inspection:

There are three types of quality management system in sewing section. By which combine can ensure the better quality. This are-

- QC (Quality Checker)
- QA (Quality Assurance)
- RQS (Required Quality System)

In this three process combine a quality full garments can produce.

- QC- Check the garments in the end table.
- QA- Check the garments in line may be in specific operation
- RQS - Random quality check before shipment on the basis of AQL.



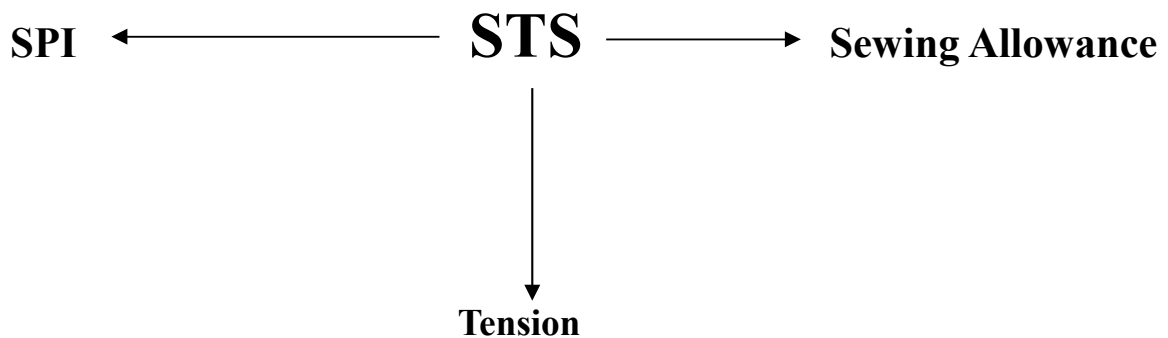
Fig-3.4 End line quality check

3.4.1 Dimension of Quality:



Fig:3.4.1 Quality dimension diagram

3.4.2 The core concept of sewing quality:



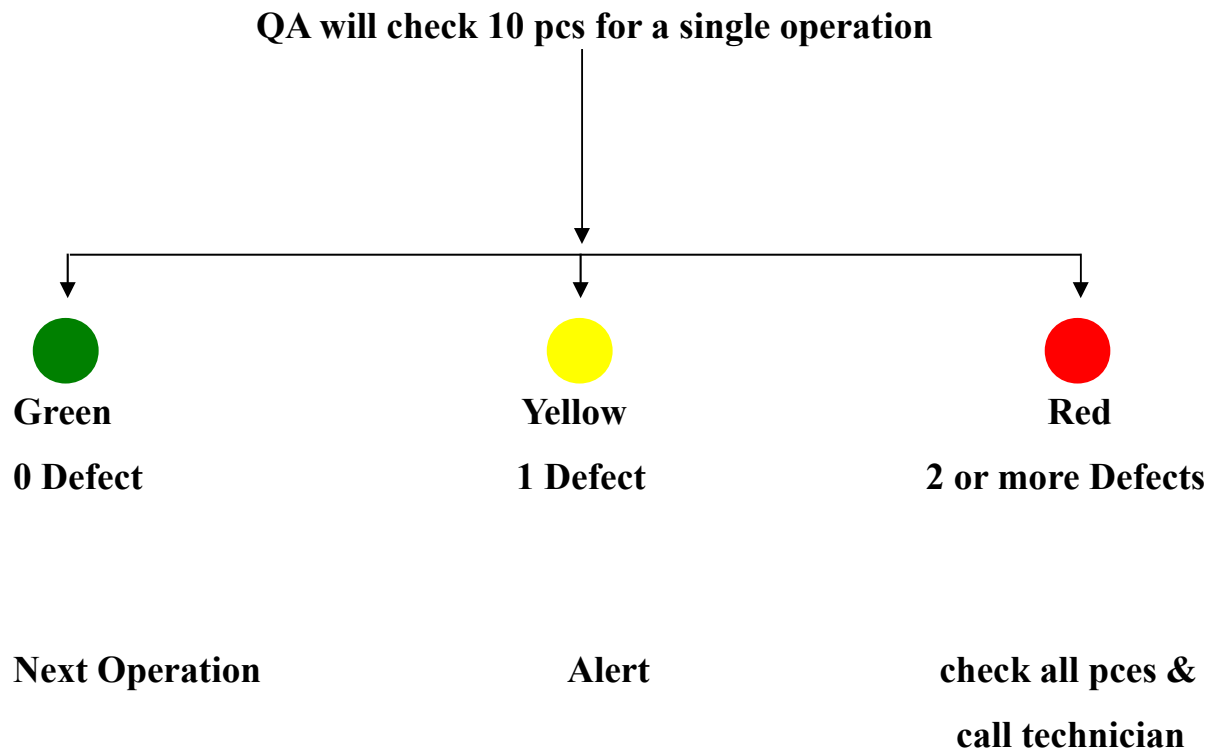
SPI- Stitch per inch (Maintain buyer required stitch per inch)

T- Tension (Check proper machine tension)

S- Sewing Allowance (Seam control)

S+T+S= Best Seam Quality

3.4.3 Traffic Light Guide System:



Yellow:

If found a defect then call & inform the following person respectively

1st Time- Operator/ Line Controller

2nd Time- Line Controller/ Senior Controller/ Operator/ Quality Controller/ Technician

3rd Time- Controller/ Quality Controller/ Technician / Manager/ Department Head

Red:

If found defect 2 or more then call & inform the following person respectively

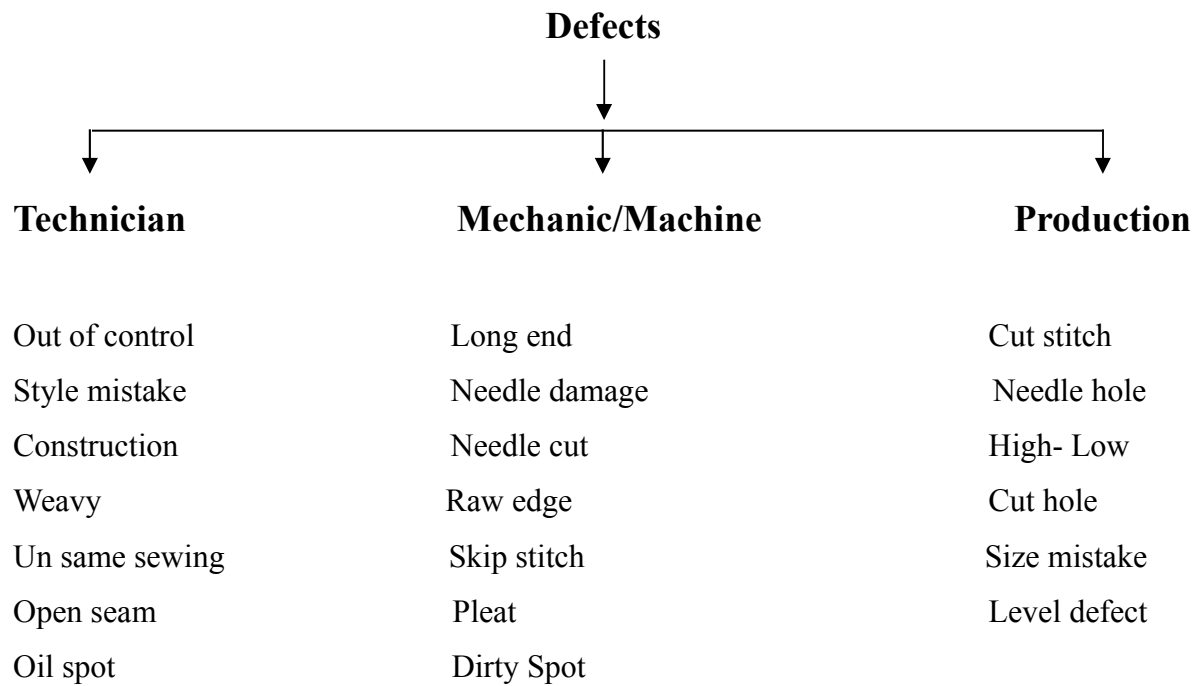
1st Time- Senior Controller/ Technician/ Manager

2nd Time- Manager/ department Head



Fig-3.4.3 Traffic guide line for operator

3.4.4 Kind of Defect & Responsible Person:



This three people or section is liable for the above defects. They are responsible to solve this problem.

3.4.5 Classification of defects

- Critical Defect
- Major Defect
- Mainor Defect

❖ **Critical Defect:** Critical defect are considered the following areas

1. Information
2. Safety issue
3. Cartons found with insect
4. Strong Oder
5. Moist product
6. Chemical issue

Description: Any metal contaminant in a product including needles, pins, metal splinters, tag, gun needle, thread trimmers, insecure studs, rivets, poppers, buttons & eyelets, & hooks,& eyes, missing fire warnings (where requested), insecure moist including badges, plastisol placement, prints, welded, plastic badges, bows, thread ends in any area of garments for children aged 36 month & under. Floats behind embroidery longer than 1 cm on garments for children 36 month & under. Any type of animal or insect infestation or evidence of insecure pile on faux fur used on any garments for children 36 month & under. Use of monofilament thread. Open ended zips without top- kop for all garments or children 14 years & under.

❖ **Major Defect:**

Major defects are those which is visible easily. Like-

1. Impression mark
2. Incorrect size/level/packing/barcode
3. Chipped enamel component
4. Insecure button
5. Incorrectly positioned button/ hook

6. Cut stitches
7. Creases
8. Needle damage
9. Insufficient seam bite
10. Cut stitch
11. Insecure linking & hem felling
12. Skipped stitch
13. Misplacing
14. Uneven hems
15. Incorrect registration of print
16. Stripes not matching
17. Twisted straps
18. Dirty marks
19. Dropped stitch
20. Holes & cuts
21. Twisted seam
22. Insecure seam
23. Oil satin
24. Out of tolerance
25. Needle hole
26. Rae edge
27. Incorrect stitch count
28. Shine mark
29. Bobbling
30. Pleats
31. Roping
32. Unevenness
33. Iron mark
34. Puckered seam
35. Long end
36. Over pressing
37. Impression mark

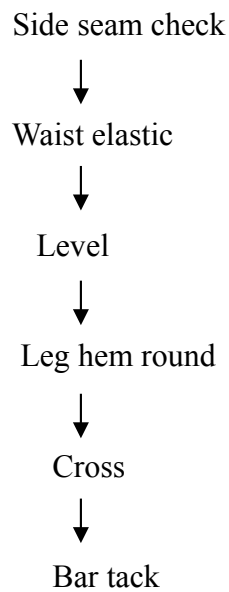


Fig-3.4.5 Measurement check of a brief

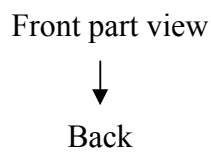
Minor defect: Minor defects are those which is not visible easily. As we want to ensure super quality, so we are not considered any kind of defect as a minor.

3.4.6 How to check a panty:

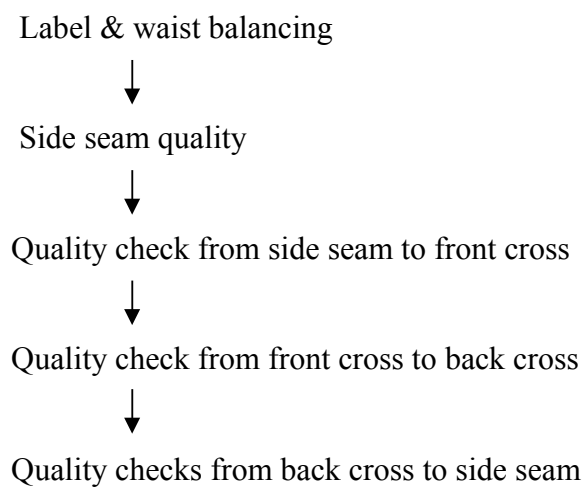
Steps-1:



Step-2:



Steps-3:



Steps-4:

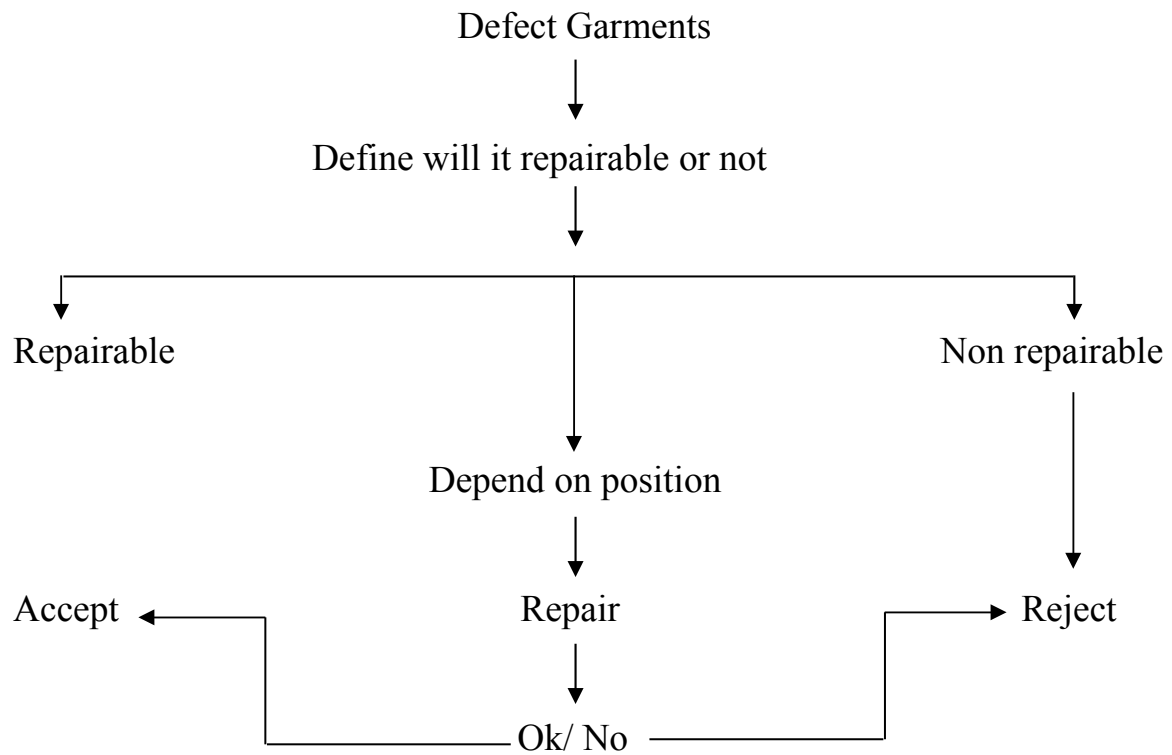
Leg measurement

Waist measurement



Fig -3.4.6 - Checking body as per standard method.

3.4.7 How to handle the defect garmets



3.4.8 Factor considers for checking a garment:

For a Panty:

- Twisted leg.
- Weavy leg/waist.
- High-low side seam.
- Off shape crotch.

For a string & Thong

- Off shape back string.
- Waist point bar tack.
- Weavy

For Finishing:

- Unbalance hanging.
- Pair mismatch.
- Loose paper top stitch.
- Wrong attach of country information tag.



Fig- 3.4.8 Finish garments hanging

04

EXPERIMENTAL DETAILS

27

4.1 Basic Parts of a bra:

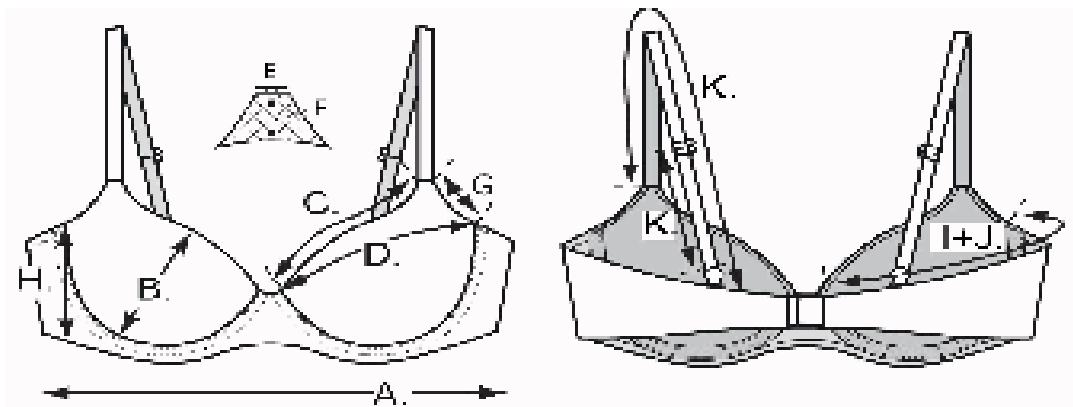


Fig: 4.1 Classical Bra

- A- BOTTOM
- B- CUP HEIGHT ON PADDING
- C- FRONT LENGTH ON PADDING
- D- CUP WIDTH
- E- GORE WIDTH ON LINING
- F- GORE HEIGHT ON LINING
- G- CUP SIDE ON PADDING
- H- SIDE HEIGHT
- I- TOP WING
- J- TOP WING MINIMUM EXTENDED
- K- STRAP LENGTH

4.2. Basic part of a panty :

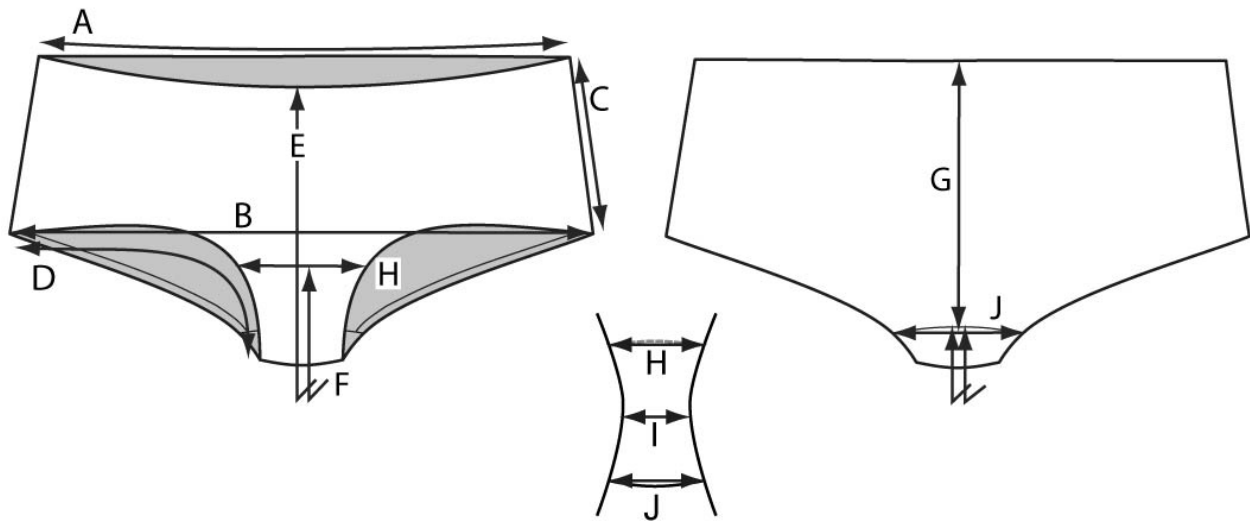


Fig: 4.2- Boy's shorts

- A. 1/2 WAIST*
- B. 1/2 SEAT AT BTM OF SIDE
- C. SIDE SEAM
- D. 1/2 LEGOPENING
- E-FRONT RISE
- F. CROTCH LENGTH
- G. BACK RISE
- H. CROTCH FRONT
- I. CROTCH WIDTH AT 1/2 CRTCH
- J. CROTCH BACK

4.3 Data

I have collected data of defective products . In bellow the total data is given

Line no- 1

Style: Classical Bra

Buyer: Charlott

Table- 01

Defect name	Defect area	Defect no
Long ends	All over	11
Bow side	Middle	3
Without bar tack	-	3

Line no: 2

Style: Girls Shorts

Buyer: H & M

Table no-2

Defect name	Defect area	No. of defects
Open seam	Waist, leg	13
Raw edge	Leg	1
Cut stitch	Leg	4
Pleat	Leg	2
Skip stitch	Leg	3
Roping	-	26
Puckering	Leg opening	1
Chalriveres	Side seam	6

Line no: 3

Style: Push-up Bra

Buyer: Charlotte

Table no-3

Defect name	Defect area	No.of defects
Long ends	All over	10
Skip stitches	-	10
Spot	-	4
Raw edge	Cup	1

Line no-4

Style: Sally Boys shots

Buyer: H&M

Table no-4

Defect name	Defect area	No. of defects
Long ends	All over	33
Open seam	Leg	14
Raw edge	Leg	12
Cut and skip stitch	Leg	11(3+8)
Spot	-	20
Charerivers	-	1
Uneven join	-	6

Line no: 5

Style: Greta String

Buyer: H&M

Table no-5

Defect name	Defect area	No of defects
Long ends	All over	14
Open seam	Leg	3
Raw edge	Waist	8
Uneven gathering	Leg	9
Pleat	Leg	8
Spot	-	13

SQ BIRICHINA LIMITED
Hourly Feed Off Inspection Report (Lingerie)

		Hours									
		9.00	10.00	11.00	12.00	2.00	3.00	4.00	5.00	6.00	7.00
Fabric & Stains	Contamination										
	Knitting										
	Hole										
	Spot										
	Stains										
	Handling Stains										
Rejections											
DEFECT NAME	DEFECT AREA										
Out of Tolerance	Waist										
Long Ends	All Over										
Non Inclusion	Elastic Waist										
	Elastic leg										
Needle Damage	Gusset										
	Waist								III		I
	Leg		I								
Open Seam	Side Seam							II			
	Waist		II	I	III		II				
	Leg								II		
Raw Edge	Side Seam									III	
	Gusset										
	Waist						II				
Miss Stitcs	Side Seam				II		I				
	Leg										
	Gusset										
Uneven Gathering	Waist	II		III							
	Leg										
	Side Seam										I
Pleat	Waist								II		
	Gusset										I
	Leg	II	I								
Steps	Waist										
	Leg										
Bobbling	Side Seam										
Track Missing	Side Seam										
Label Defects	Label Open										
	Label Missing	III	III	III	III	III	III	III	III	III	III
Checked Qty		343	340	335	313	258	270	272	313	290	
Defect Qty		07	08	07	08	09	06	08	10	08	
Pass Qty		336	332	328	305	249	264	264	303	282	
Controller Sign		<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
Sign		<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
Sign		<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	

Defect (More than 5%)	Root Cause	Corrective

QA Sign _____ Controller Sign _____ DQM _____

Fig: 4.3 Defect check list

Line no: 06

Style: Boy short

Buyer: H & M

Table no-6

Defect name	Defect area	No. of defects
Long ends	All over	28
Open seam	Leg	13
Raw edge	Leg	12
Cut and skip	Leg	20
Uneven join	-	8
Spot	-	10
Pleat	Leg	3
Roping	-	8
Without bar tack	-	2

Line no: 7

Style: Liza string

Buyer: H&M

Table no-7

Defect name	Defect area	No of defects
Long ends	All over	39
Raw edge	Side seam	5
Pleat	Leg, waist	4
Spot	-	10
Without bar tack	-	6

Line no: 08

Style: Boys short

Buyer: H & M

Table no-8

Defect name	Area	Defect no
Long ends	All over	30
Raw edge	Hem	5
Cut stitch	Hem	1
Uneven joint	Hem	6

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Line no: 9

Style: High leg

Buyer: Charlotte

Table no-9

Defect	Defect area	No. of defects
Long ends	All over	2
Open seam	Waist, leg, gusset	26
Pleat	Side seam, leg	8
Bobbling	Side seam, leg	6
Bow side	Side seam	5



Fig: 4.4 Quality check

Line no: 10

Style; Boy's short

Buyer: H&M

Defect	Area	No. of defects
Out of tolerance	Waist	13
Long ends	All over	21
Cut stitch	Leg	07
Weavy label	Waist	25
Uneven hem join	Hem	4
Spot	-	2

4.4 Statistic of defects or faulty garments in 5 November, 2014:

Table no-11

Line no	Quality checked	Defects	Percentage
1	517	17	3.29%
2	766	56	7.31%
3	625	25	4%
4	1574	97	6.16%
5	3714	54	1.45%
6	2068	104	5.02%
7	3747	63	1.68%
8	1550	42	2.71%
9	2063	47	2.28%
10	984	72	7.32%
Total	17608	577	3.2%

4.5 Major defects found in 10 lines:

Total defects in a day

Table no-12

Types of defect	Checked	Defects	Percentage
Long ends	17608	188	1.06%
Open seam	17608	68	.39%
Raw edge	17608	44	.25%
Cut stitch	17608	23	.13%
Skip stitch	17608	33	.18%
Pleat	17608	25	.14%
Bow side	17608	8	.045%
Roping	17608	34	.19%
Spot	17608	59	.34%
Uneven joint	17608	24	.13%
Puckering	17608	1	.005%
Chalervers	17608	7	.04%
Without bar tuck	17608	11	.06%
Uneven gathering	17608	9	.05%
Bobbling	17608	6	.03%
Out of tolerance	17608	13	.07%
Wavy label	17608	25	.14%
Total	17608		3.2%

Total defects 3.2 % (average)

4.6 Rote cause analysis:

Table no-13

Defect	Causes
Long ends	Mechanical/ machine problem
Open seam	Operator/ handling
Raw edge	Operator or machine problem
Skip stitches	Mechanical or machine problems
Pleat	Operator or handling problem/ machine
Spot	For oil spot machine is liable but may also have other issue.
Uneven joint	operator handling issue
Cut stitch	Operator problem
Needle damage out of tolerance	Machine problem
Weavy	Technician/ machine problem

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4.7 Fish bone diagram:

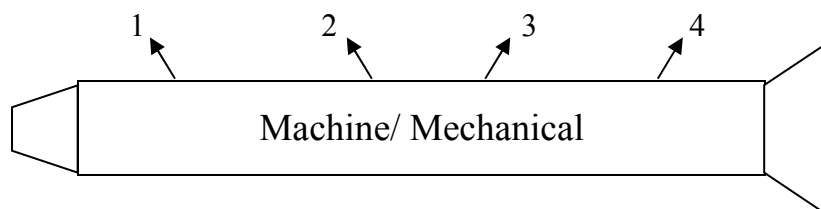




Fig: 4.7 Fish Bone diagram

Here 1, 2, 3..... Is the various defect problem which is created by machine or mechanical problem. These defects are responsible for mechanical problem directly or indirectly.

05

DISCUSSION & RESULT

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5.1 DISCUSSION & RESULT

Finally the total average defect is 3.2%.

Among these defects more than 1.5% defects are responsible for mechanical or machine problems.

Other problems or defects are occurred by sewing, operators and others. But anyhow all the problems are related to mechanical problems. Because the other sewing defects which is occurred due to improper handling by operator are responsible for two causes.

1. Unskilled operator
2. Machine create problem during operation.

So, mechanical/ maintenance/machine is a big issue for creating defects.

So by taking some technical method like STS, Traffic light, checking system quality management system can improve and by fish bone diagram method defect percentage can be reduced.

5.2 FINDINGS

- In Bangladesh most of the garment factories use different tools for quality management but not in organized way. When needs, they use these tools haphazardly.
- In Bangladesh most of the garments factories use 4-point system for inspecting fabrics of garments.
- Most of the buyers are importing garments from Bangladesh with AQL (acceptable level) 2.5.
- Most of the garments manufacturers are doing inspection during the manufacturing process of garments.
- Other tests such as shrinkage tests, color fastness

Tests, azo free tests are done according to the buyers' requirements.

5.3 RECOMMENDATION

- Every garment factory should implement different tools rote cause analysis, 80-20 rules, and fish bone diagram for perfect quality management.
- As inspection is always visual, sometimes machine can be used for inspection of garments.
- The 4-point system has some limitations so that this system should be used with proper care.
- Every garment should implement some technical method like, traffic light system, garments checking system, defect analysis etc.

5.4 CONCLUSION

In Bangladesh every garments manufacturer should give first preference to its valued customers. Now-a-days buyers are very much quality conscious. If it becomes possible to maintain a high Quality system of inspection policy, the buyers shall be motivated to place more orders in Bangladesh. So, it is possible to set different modern quality procedures and quality management techniques in Bangladesh for the betterment of its RMG sector and specially to lingerie unit. As this unit has a great scope in our country, so we should maintain standard quality to being the leading position in this unit.

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