Faculty of Engineering

Department of Textile Engineering

REPORT ON
Investigation on causes and remedies of quality problems in knit garments production.

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Approval Sheet

This research entitled ''Investigation on causes and remedies of quality problems in knit garments production' **at Daffodil International University, A. Y. 2015**'' prepared and submitted by **Anup Kumar Mridha, ID: 113-23-2747, Ajit Sutradhar, ID: 113-23-2661; Monoranjan Kha ID: 113-23-2660** in partial fulfillment of the requirement for the degree of BACHELOR OF SCIENCE IN TEXTILE ENGINEERING has been examined and hereby recommended for approval and acceptance.

Abdullah Al Mmamun

Supervisor

DECLARATION

We declare that, this project has been done by me under the supervision Md. Abdullah Al Mamun Assistant Professor, Department of Textile Engineering-Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree.

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We would like to thank our entire course mate in **Daffodil International University**, who took part in this discuss while completing the course work.

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DEDICATION

With the deep sense of or honor to our beloved and dearest parents, Teachers and all other those who devoted their yesterday for our successful and bright today.

Abstract

All this process are one of the most important stages in labor intensive ready-made clothing enterprises. Quality faults occurring during this process adversely affect the product quality and product efficiency, and also increase the production cost. The aim of this study is to investigate whether the woven production process is under control in a knit production enterprise and to detect the processes with highest rates of sewing faults in sewing department and finally to make suggestions for improving the quality control. Among the Statistical Process Control methods; control list, product control chart were used in the study.

Product control chart was used to test whether the production process is controlled in the enterprise. Furthermore, the statistical methods were employed to determine the issues that need to be done in the improvement efforts and to detect the relations between the process groups supposedly effective on faults occurring in knitwear production and the amount of faults. Also, the processes with highest amounts of finish fabric fault, cutting fault, sewing faults, finished garments and the effects of these processes on fault rates were investigated. As a result, it was concluded that the production process was statistically not under control in the ready-made clothing enterprise. In addition, this study demonstrated that the investigation of each process group by drawing their product control charts would make significant contributions to foresee the results and prepare more effective the improvement plans.

Contents

1. INTRODUCTION

Quality is defined as the level of acceptance of a goods or service. It is a very essential requirement for any kind of product. Every product should maintain the standard quality level and find out the major fault. And

Its causes identify and then should remove the fault.

.

It's an indispensable part of study a practically running processing technology of an industrial unit for a student .In our university , processing machines are not in continuous running condition, so it would only provide demonstration of mechanical features & processing technology of the material in accomplishment of the theory there of but not of the situational variables to achieve practical knowledge. Quality has been with us since the dawn of civilization, however, a competitive weapon or competitive advantage. In order to understand this we have only to look at Japan which is textbook case of how a nation used quality to become a world player in trade the industry. Some of the other countries such as South Korea, Taiwan, and Singapore in Asia / Pacific follow this model and became very successful in the world arena. Customers all over the world have become so demanding and expecting good quality that increasingly, quality is no longer a competitive advantage, but it is becoming a sheer necessity to survive in the marketplace. Therefore, quality has to be designed and built into products and not just "inspected" into products

The costs represented by this effort can be a significant proportion of the products sales value

(Do you know what the total is in your Company? In some instances the cost of scrap, rework

and inspection costs alone has been found to be as high as 20% of turnover) and any manufac-

turer should be interested in making sure that he is getting good value for his expenditure. He

cannot feel sure unless he has studied what the costs are, how they are incurred and what they

ought to be. If they are higher than they should be, he must consider ways in which they can

be reduced. Here we describe the nature of the costs incurred in ring product quality and relia-

bility and shows how costs can be reduced whilst quality and reliability are maintained or im-

proved

1.1. Aim of this project:

The aim of project is increasing the production by controlling quality. ofgarments. To fault measurement indifferent process and rating of fault percentage. That's means which fault the more affective in this process. And find out the more effective fault and its causes and remedies. So that production will be high & high quality garments.

1.2, Objective of this project:

- ➢ To increase the production of knit garments
- ➢ To produce the high quality of garments
- ➢ To find out the major fault
- ➢ To find out the cause the fault which reduces the production
- ➢ To remove this major fault.
- ➢ To solution of this fault.

2. Literature Review

Each & every product features some special characteristics for which it is in demand by consumers. History of quality is as old as human civilization itself. Aristotle 2500 years ago defined quality as following:

1. Quality is the difference between products.
2. It is the goodness or badness in a product. This definition holds true till this date. However, in general terms, quality encompasses important characteristics of a product for which, it is in demand. Quality is also referred to as "conformance of goods to buyers' specifications". ISO 9000: 2000 defines quality as "degree to which a set of inherent characteristics fulfill requirements".

2.1 Quality depends on:

Quality depends on two things. Such as given below:

Form: It represents features of a product in terms of shape, size, style, design & measurements.

Content: It represents features expressing internal quality, implying quality of raw materials & the value additions attached to it.

2.2. Importance of quality:

Every product must feature functional characteristics as well as some other aspects related to its shape, size & design. Consumers always demand following expectations of the purchased product:
The product must satisfy the consumer in terms of beauty, attractiveness, taste, shape, design & longevity etc. depending on the type of product.

A product devoid of quality has no demand among consumers & as such, has no salability. Excellent quality characteristics enhances salability of the goods & are the keys to profitability for the manufacturer or the seller. Most importantly, some criteria of customer satisfaction are negotiable but quality is such a factor that it is not at all

2.3.Types of Quality:

As per excellence of satisfaction, quality may be grouped into three categories:

1. Quality of general acceptance;
2. Quality of satisfaction;
3. Quality category of higher delight.

A black & white television now-a-days brings in only quality of general acceptance while a color television provides to the buyer quality of satisfaction. On the other hand color television with a remote control brings forth quality of great delight to buyer.

2.4. Quality characteristics in an apparel:

In a clothing factory, manufactured garments must possess specified quality characteristics. They are giver below: 1.   Measurements specified by the buyers;

2. Specified sewing & stitching quality
3. Raw materials must possess specified quality
4. Garments must possess specified design characteristics.
5. Assortment specified by the buyer
6. Finishing, packing, packaging must be specified by the customers.

So, quality of garments implies whether the specified garment has been produced with specified raw materials, with buyer specified stitching & sewing quality, with specified sizes, shapes, design & assortment.

In clothing industry, demanded quality characteristics of the garments are informed to the manufacturer through work sheet, approved sample & size spec etc.

2.5.Quality Control:

Quality control is the operational techniques and activities that are used to fulfill requirements for quality. On the other words, a system applied to manufacturing operations to monitor & regulate production process continually so that products meet specification.

To control the quality of garments or products two techniques are followed, such a:

- Testing and
- Inspection

.2.5.1.Testing:

To those engaged in the production, distribution and consumption of textiles, testing can be a valuable aid provided tests are made the results must be studied carefully so that the right course of action may be taken. Testing instruments cannot make decisions and in the end some person has to interpret the data and issue the necessary instructions for future action.

2.5.1.Inspection:

The inspections are done to control the quality is means by examining the products without any instrument. To examine the fabric, sewing, button, thread, zipper, garments measurement and so on according to specification or desired standard is called inspection. There are so many facilities for inspection in every section of garments industries. The aim of inspections is to reduce the time and cost by identifying the faults or defects in every step of garments making.

2.6. Quality Assurance:

To carry out all those planned and systematic actions necessary to provide adequate confidence that a product or service will satisfy given requirements for quality is called Quality assurance. On the words, this is a system to assure that product & services meet customer requirements.

2.7. Quality Management System

Quality Management System (QMS) is a set of interrelated techniques, measures and management system designed to prevent defects from occurring or if they occur at all. Counter-measures are adopted immediately so that they do not recur. QMS takes recourse to preventive as well as remedial measures.

2.8. 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 the 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 mixup 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.

2.9. Total quality management:
This is one of the latest concepts of management that can ensure the highest standard of quality and productivity ensuring good for all of the workers, management and society. In this system, quality of management and actions are ensured by assuring quality at all stages from vision, planning, purchase, store, cutting, sewing, inspection, packing, administration, welfare, personnel motivation etc. TQM envisages high work standard, work-environment, managerial standard, motivation etc. Thus comes the concept of production system with minimal or "zero de-fact".

2.10. Job description of Quality Manager:
The quality manager is a very important official in a garment factory. Customer satisfaction, reputation of the company, to a large extent, depends upon him. His job description is given below:

1.   He will install or maintain a right Quality Management System to ensure quality of product;

2.   He will ensure that the QMS is in place & working as envisaged;

3.   He will ensure that the existing QMS satisfies the buyer;

4.   He will look for ways of improving existing QMS so as to exceed expectations of the customer;

5.   He will ensure that buyer's specifications are properly understood;

6.   If there is any ambiguity/ confusion, he will confirm buyer's actual Specifications;

7.   He will ensure that AQL of the company is properly maintained & exceeded.

8.   He will ensure that all incoming, in-process & final goods are properly inspected & documented.

9.   He will ensure that all goods coming in the store are rigorously inspected for quality & quantity;

10.   He will ensure that Traffic Light Chart system of in-line inspection system is installed & working;

11.   He will install both preventive & remedial measures against occurrence of any defect;

12.   He is responsible for failure of quality passed garment;

13.   He will ensure that all of his personnel are trained on their topics;

14.   He will ensure continuous training of personal to enhance their skill;

15.   He will ensure rigorous control of rejects;

16.   He will ensure rigorous control of repairable & washable garments;

17.   He will plan for year-wise improvement of quality;

18.   He will prepare a quality manual for the company so that company's quality policy & procedures are known to all and implemented at all levels;

19.   He will ensure that quality manual includes all policy, procedures, methods & measures so as to unify actions;

20.   He will monitor performance of suppliers of raw-materials;

21. He will have his personnel motivated.

22. He will ensure that supplier-customer chain in maintained in the production process;

23. He will ensure that production commences only when worksheet approved sample & swatch card are at hand.

2.11. ISO:

According to ISO,

Quality is the fulfillment of specified requirements of the product or service' another definition of ISO,

The totality of features & characteristics of product or service that bear on its ability to satisfy stated or implied needs. The term usually combined with a number or name used to identify textile products. A relative term used to indicate the perceived merits of similar products for same end use.

* Quality varies from customer to customer.
* Quality is the reflection of customs.

2.12. Quality Inspection

The inspections are done to control the quality is means by examining the products without any instrument. To examine the fabric, sewing, button, thread, zipper, garments measurement and so on according to specification or desired standard is called inspection. There are so many facilities for inspection in every section of garments industries. The aim of inspections is to reduce the time and cost by identifying the faults or defects in every step of garments making.

To do success in inspection, the process can be run by maintaining following "inspection loop".
   a. Inspection
   b. Identify the defects or faults

c. Knock the appropriate person

d. Identify the reasons of defects or faults

e. Remove the defects or faults.

Mainly inspections are done in three steps in garments industries. The steps are:

1. Raw material inspection

2. In process inspection

3. Final inspection.

2.13. Inspection System:

There are various fabric inspection systems as listed below. However we will discuss only the 4-point system because it is used most widely.

1. 4- Point system   2. 10- Point system

3. Graniteville '78' system 4. Dallas system

5. Textile distributors Institute (National Federation of Textiles-1955) system

6. 4- Point system- Revised.

2.14. 4- Point System:

The 4- Point system also called the American Apparel Manufacturers Association (AAMA).

In this method, defected points are found out in 100 square. Yds. Of fabric must be rejected if the defected points are greater than 40.

Defects length for warp way and weft way	Points
Up to 3"	1
3" ~ 6"	2
6" ~ 9"	3
Above 9"	4

Defects area for holes and openings	Points
1" or less that 1"	2
Above 1"	4

Note: It must be remembered that, defected point must not be more than 4 in each yard.
For example: for 100 square. Yds.Inspection

Defects length	No of faults	No of points
Up to 3"	10	10 X 1 = 10
3" ~ 6"	5	5 X 2 = 10
6" ~ 9"	2	2 X 3 = 6
Above 9"	0	0 X 4 = 4
		Total = 26

2.15. AQL (Acceptable Quality Level):

The AQL is the maximum percent defective that for the purpose of sampling inspection can be considered satisfactory as a process average. When a customer designates some specific value of AQL for a certain defect or group of defects he indicates to the supplier that his (the customer's) acceptance sampling plan will accept the great majority of the lots or batches that the supplier submits, provided the process average level of percent defective in these lots or batches is no greater that the designated value of AQL. Thus, the 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. The AQL is generally expressed in per cent (%). The AQLs most widely used in apparel industry are 2.5, 4.0, 6.5, and 10.0 depending on the price and item. For example, for low price items and children's wear AQLs of 6.5 and 10.0 may be quite appropriate, however, for higher price items AQLs of 2.5 and 4.0 may be appropriate.

2.16.Inspection Zone:

Visual defects are categorized as Major, Minor and Critical defects. In some cases, a major defect can be considered as minor based on the location of the defect in a garment. This location is called as zone. Zoning is done for fair evaluation of the garment during visual audit. A garment can be divided up to 3 zones, like A, B and C. How many zones a garment would have are depends on products and end use of the garment. Following zoning and marking defects accordingly (only major and minor defects are considered) inspector prepares audit report. So it is important to divide garment into sections and mark defects accordingly. For example, poor press at center front (zone - A) of a shirt is considered as major defect but if poor press is detected in back bottom (Zone-B) of the same garment it is considered as minor defect. You should be aware that defects that falls under B and C zones are not always considered as minor defects.

Most of the cases apparel buyers provide garment figures with marking zones in their quality manual. And provide a list of defects that fall under major or minor categories. In the following figure (source: Gap Inc.) a knitted top has been shown with zones A and B. At the front sleeves and upper front is considered as zone 'A' and lower front considered as zone 'B'. On the back of the garment, under arms and back bottom is considered as zone 'B'

2.17. Figure:

FRONT   BACK
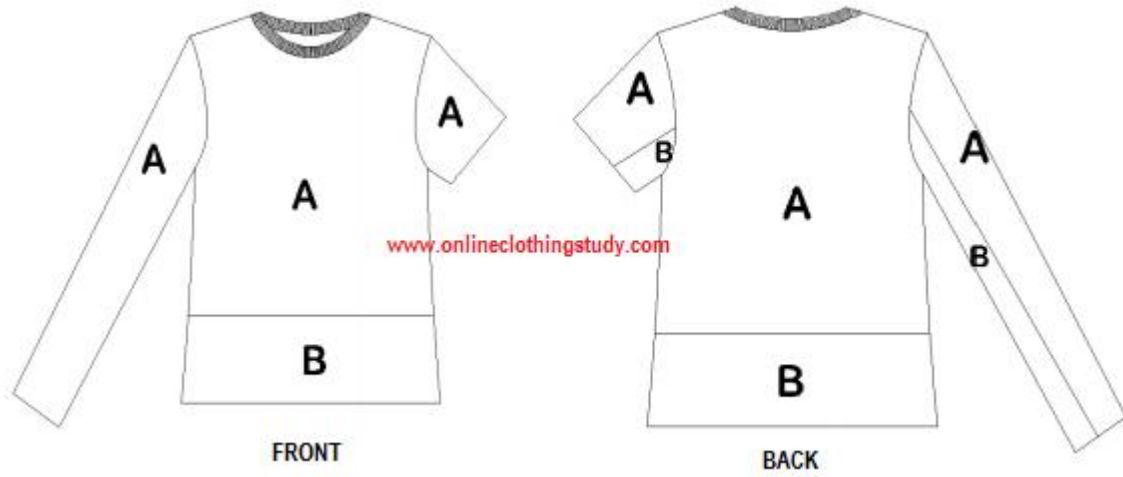
Like the above example, each product can be divided into zones and set standards for defects which all will fall under major and minor defect categories.

3. Data Collection:

3.1. Finished fabric:

A fabric finish is applied to a fabric once it has been made to improve its appearance, feel or other properties.

3.1.1. Intensity problem (%):

Finished fabric Inspection report

Date	Width	Length	GSM	Roll	Fault						Other Fault	PTS	Pts/100 Spyd	Class
					BR	YC	HL	OS	DS	LM				
23/06/15	56	45	233	20	-		5	-			joint	24	36.55	A
	55.5	46	227	12	-		6	2			''	26	36.66	A
	56	48	228	13	-		4	-			''	24	32.14	A
	56	50	236	3	-		5	-			''	28	32.14	A
	55	58	228	5	-		4	-			''	24	27.55	A
	56.6	44	233	6	-		6	2			''	26	37.65	A
Total fault:					0	0	30	4	0	0				
24/06/15	60	55	187	5	-	-	6	-	-	-	''	28	30.54	A
	61	54	183	2	-	-	7	-	-	-	''	28	30.60	A
	62	60	185	1	-	-	6	-	-	-	''	28	27.09	A
	62	65	185	3	-	-	4	-	-	-	''	16	14.29	A
	62	63	186	4	-	-	5	-	-	-	''	20	18.43	A
Total fault:					0	28	0	0	0					
As similar :														
25/06/15														
Total fault							46	09						
26/06/15														
Total fault:						11	22		18					
27/06/15														15
Total fault						7	10	9						
28/06/1														

							57		09	51				
5														
Total fault:							57		09	51				

Total fault of finished fabric inspection in six days: 315

                                                            Express as %

No. of hole= 193   =(193÷315)×1000=61.26

No. of yarn contamination= 18   =(18÷315)×1000=5.71

No. of oil stain=26   =(26÷315)×1000=8.25%

Dye stain: 27   =(27÷315)×1000=8.57%

No. of Lycra missing: 51   =(51÷315)×1000=16.19%

❑ **Faults in the Knitted Fabrics:**

A defect of the knitted fabric is an abnormality which spoils the aesthetics i.e. the clean & uniform appearance of the fabric & effects the performance parameters, like; dimensional stability etc.

There are various types of defects which occur in the Knitted fabrics of all types caused by a variety of reasons. The same type of defects may occur in the fabric due to a variety of different causes e.g. Drop Stitches, Spirality etc.

❑ **Category of Defects:**

Yarn Related Defects:
Almost all the defects appearing in the horizontal direction in the knitted fabric are yarn related. These defects are mainly;

1. Barriness

2. Thick & Thin lines
3. Dark or Light horizontal lines (due to the difference in dye pick up)
4. Imperfections
5. Contaminations
6. Snarling
7. Spirality

❑ **Knitting Elements Related Defects:**
Almost all the defects appearing in the vertical direction in the knitted fabrics are as a cause of bad Knitting Elements.These defects are mainly;

1. Needle & Sinker Lines
2. Drop Stitches etc.

❑ **Machine Settings Related Defects:**
These defects appear randomly in the knitted fabrics due to the wrong knitting machine settings &that of the machine parts. The defects are mainly;

1. Drop Stitches
2. Yarn Streaks
3. Barriness
4. Fabric press off
5. Broken Ends
6. Spirality

❑ **Dyeing Related Defects:**
The Dyeing related defects are as follows;

1. Dyeing patches
2. Softener Marks
3. Shade variation
4. Tonal variation
5. Color fading (Poor Color Fastness)
6. Dull shade
7. Crease or rope Marks

❑ **Finishing Related Defects:**
Defects caused mainly due to the wrong process parameters are;

1. High Shrinkage
2. Skewing
3. Spirality
4. Surface Hairiness & Pilling

5. Tonal variation
6. Snagging (Sharp points in the dyeing machine or trolley etc)
7. Fold Marks
8. Wet Squeezer Marks
9. GSM variation
10. Fabric Width variation
11. Curling of S.J. Fabrics

3.1.2 Definition Drop Stitches (Holes:

Drop Stitches are randomly appearing small or big holes of the same or different size which appear as defects in the Knitted fabrics.

3.1.3. Sample:
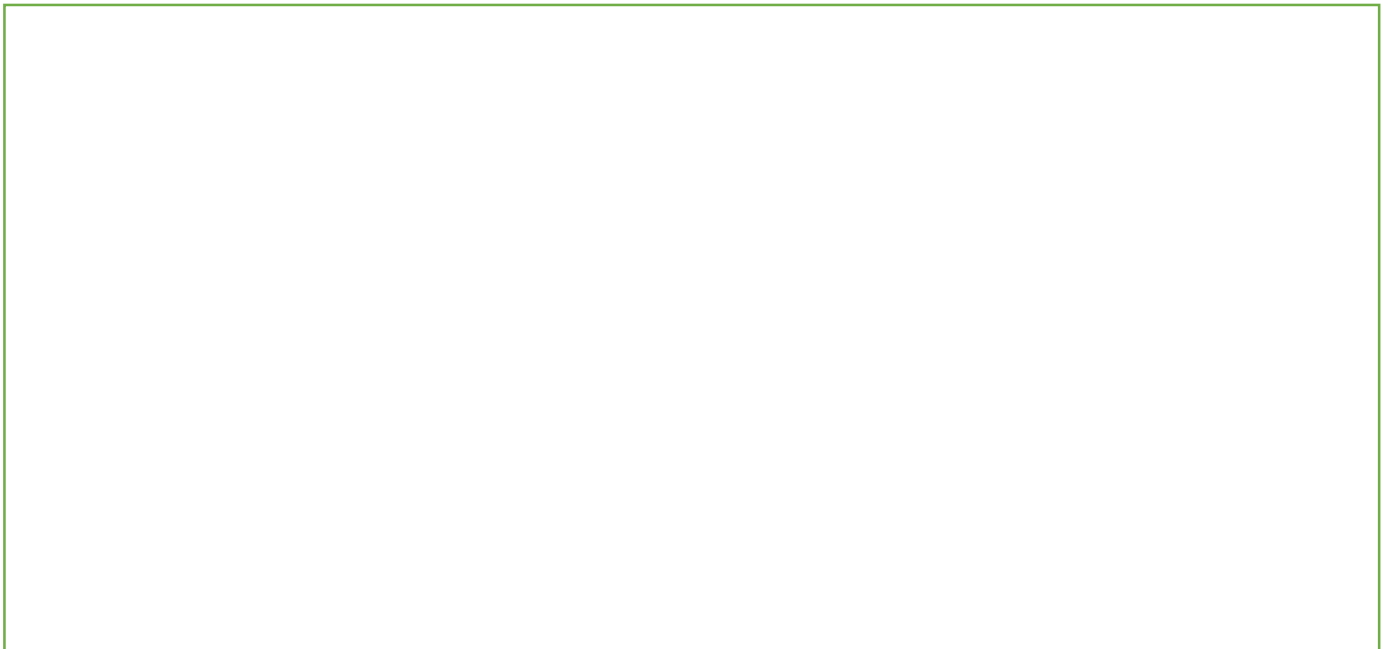
3.1.4 .Causes:

- High Yarn Tension
- Yarn Overfeed or Underfeed
- High Fabric Take Down Tension
- Defects like Slubs, Neps, and Knots etc.
- Incorrect gap between the Dial & Cylinder rings.

3.1.5 .Remedies:

- Ensure uniform yarn tension on all the feeders with a Tension Meter.
- Rate of yarn feed should be strictly regulated as per the required Stitch Length.
- The fabric tube should be just like a fully inflated balloon, not too tight or too slack.
- The yarn being used should have no imperfections like; Slubs, Neps& big knots etc.
- The gap between the Cylinder & the Dial should be correctly adjusted as per the knitted loop size.

3.1.6. Definition of Barriness:

Barriness defect appears in the Knitted fabric in the form of horizontal stripes of uniform or variable width.

3.1.7.Causes:

- High Yarn Tension
- Count Variation
- Mixing of the yarn lots

- Package hardness variation

3.1.8Remedies:

- Ensure uniform Yarn Tension on all the feeders.
- The average Count variation in the lot should not be more than + 0.3
- Ensure that the yarn being used for Knitting is of the same Lot.

- Ensure that the hardness of all the yarn packages is uniform using a hardness tester.

3.1.9. Definition of Streakiness:

Streaks in the Knitted fabrics appear as; irregularly spaced &sized, thin horizontal lines.

3.1.10. Causes:

- ➢ Faulty winding of the yarn packages.
- ➢ Yarn running out of the belt on the Pulley

3.1.11. Remedies:

- ➢ Winding of the yarn package should be proper.
- ➢ The yarn should be running between the belt and around the pulley.

3.1.12. Definition of Imperfections

Imperfections appear on the fabric surface in the form of unevenly placed or randomly appearing Knots, Slubs&Neps, Thick& Thin places in the yarn.

3.1.13.Causes:

- ➢ Big Knots, Slubs&Neps in the yarn, Thick & Thin yarn.

3.1.14. Remedies:

- ➢ Specify the quality parameters of the yarns to be used for production to the yarn supplier.

3.1.15. Definition of Snarls

> Snarls appear on the fabric surface in the form of big loops of yarn getting twisted due to the high twist in the yarn.

3.1.16. Causes:

> High twist in the yarn.

3.1.17. Remedies:

> Twist in the yarn should be in required TPM.

3.1.18. Definition of Contaminations:

Contaminations appear in the form of foreign matter such as; dyed fibers, husk, dead fibers etc. in the staple spun yarn or embedded in the knitted fabric structure.

3.1.19. Causes:

> Presence of dead fibers & other foreign materials, such as; dyed fibers, husk & synthetic fibers etc.
> Dyed & other types of fibers flying from the adjacent Knitting machines cling to the yarn being used for knitting & get embedded in the Grey Fabric.

3.1.20. Remedies:

> Use rich fiber mixing for the yarns to be used for knitting in order to have less dead fibers appearing in the fabric.
> Rigid control measures in the Blow Room to prevent the mixing of foreign matters in the Cotton mixing.
> Segregate the Spinning & Knitting Machines, with Plastic Curtains or Mosquito Nets, to prevent the fibers flying from the neighboring machines, from getting embedded in the yarn / fabric.

3.1.21. DefinitionSpirality :

Spirality appears in the form of a twisted garment after washing. seams on both the sides of the garment

displace from their position & appear on the front & back of the garment.

3.1.21.Causes:

➢ High T.P.I. of the Hosiery Yarn
➢ Uneven Fabric tension on the Knitting machine.
➢ Unequal rate of Fabric feed on the Stenter, Calender& Compactor machines.

3.1.22.Remedies:

➢ Use the Hosiery yarns of the recommended TPM level for Knitting.
➢ Ensure uniform rate of feed of the dyed fabric on both the edges while feeding the fabric to the Calender, Compactor or Stenter machines.

3.1.23.Definition Needle Lines:

Needle lines are prominent vertical lines along the length of the fabric which are easily visible in the grey as well as finished fabric.

3.1.24. Sample:

3.1.25 Causes:

➢ Bent Latches, Needle Hooks & Needle stems
➢ Wrong Needle selection (Wrong sequence of needles, put in the Cylinder or Dial)

3.1.26. Remedies:

➢ Inspect the grey fabric on the knitting machine for any Needle lines.
➢ Check the Needle filling sequence in the Cylinder / Dial grooves (tricks).

3.1.27. Definition of Horizontal lines

3.1.28. Causes:

➢ Fault in bobbin
➢ Irregular tension on cams.

3.1.29. Remedies:

➢ Replace that bobbin.
➢ Check cams positioning

3.1.30. Definition of Broken Needles/ Laddering:

Defects caused by the broken needles show prominently as vertical lines parallel to the Wales. There are no loops formed in the Wale which has a broken needle.

3.1.31Causes:

- ➢ High Yarn Tension
- ➢ Bad Setting of the Yarn Feeders
- ➢ Old & Worn out Needle set
- ➢ Cylinder Grooves are too tight restricting needle movement
- ➢ Breakage of hook or butt in needle.

3.1.32Remedies:

- ➢ Ensure uniform & the right Yarn tension on all the feeders.
- ➢ Keep the recommended gap between the Yarn Feeders & the Needles.
- ➢ Periodically change the complete set of needles.
- ➢ Remove fly or blockage from groove.
- ➢ Replace defective needle.

3.1.33.Definitions of Sinker Lines :

Sinker lines are prominent or feeble vertical lines appearing parallel to the Wales along the length of the knitted fabric tube.

3.1.34. Causes:

- ➢ Bent or Worn out Sinkers
- ➢ Sinkers being tight in the Sinker Ring grooves

3.1.35.Remedies:

- ➢ Replace all the worn out or bent sinkers causing Sinker lines in the fabric.

> Sinker lines are very fine & feeble vertical lines appearing in the fabric.
> Remove the fibers clogging the Sinker tricks (Groove

3.1.36.Definitions of Oil Lines :

Oil lines are prominent vertical lines which appear along the length of the knitted fabric tube. The lines become permanent if the needle oil used is not washable & gets baked due to the heat during the finishing of the fabric.

3.1.37. Causes:

> Fibers & fluff accumulated in the needle tricks which remain soaked with oil.
> Excessive oiling of the needle beds.

3.1.38. Remedies:

> Fibers accumulated in the needle tricks cause the oil to seep into the Fabric.
> Some lubricating oils are not washable & cannot be removed during Scouring.
> Remove all the Needles & the Sinkers of the machine periodically.
> Clean the grooves of the Cylinder & Dial of the machine thoroughly with petrol.

> Blow the grooves of the Cylinder Dial & Sinker ring with dry air after cleaning.

❑ **Broken Ends :**

Definition:
Broken ends appear as equidistant prominent horizontal lines along the width of the fabric tube when a yarn breaks or is exhausted.

 Causes:

> High Yarn Tension
> Yarn exhausted on the Cones.

❑ **Remedies:**

➢ Ensure correct yarn tension on all the feeders.
➢ Ensure that the Yarn detectors on all the feeders are working properly.
➢ Depute a skilled & alert machine operator on the knitting machine.

❑ **Fabric Press Off**

❑ **Definition:**
Fabric press off appears as a big or small hole in the fabric caused due to the interruption of the loop forming process as a result of the yarn breakage or closed needle hooks.

Press off takes place, when the yarn feeding to both the short butt & long butt needles suddenly stops due to the yarn breakage.

At times complete fabric tube can fall off the needles if the needle detectors are not functioning or are not properly set.

Causes:

➢ End breakage on feeders with all needles knitting.
➢ Yarn feeder remaining in lifted up position due to which the yarn doesn't get fed in the hooks of the needles.

❑ **Remedies:**

➢ Needle detectors, should be set precisely to detect the closed needles & prevent the fabric tube from completely pressing off.
➢ Proper yarn tension should be maintained on all the feeders.

❑ **Surface Hairiness & Piling**

❑ **Definition:**
Surface hairiness appears in the form of excess superfluous fibers, on the surface of the knitted fabrics, which have either been reprocessed, or tumble dried.

Pilling appears as, small fiber balls formed on the fabric surface, due to the entanglement of loose surface fibers.

Factors such as, the fiber staple length, low T.P.M. & fabric construction (with long yarn floats) etc. also contribute to pilling.

Causes:

➢ Abrasion due to the contact with rough surfaces
➢ Excessive surface hairiness caused, due to the abrasive tumbling action
➢ Fabric friction in the Tumble Dryer
➢ Rough Dyeing process & abrasive machine surfaces (Soft Flow Machine tubes, Tumble Dryer drum etc.)
➢ Reprocessing of the fabric is, also a major cause of piling.

❑ **Remedies:**

➢ Avoid using the Tumble Dryer.

Control

➢ Shrinkage by maximum fabric relaxation & over feed in the processing.
➢ Regularly inspect the fabric contact points on all the machines, for any rough & sharp surface.
➢ Avoid repeated reprocessing of the fabrics.
➢ Use anti pilling chemical treatments for the fabrics prone to pilling.

❑ **Snagging**

❑ **Definition:**
Snagging appears on the knitted fabric surface as a pulled up yarn float showing up in the form of a large loop.

Causes:

➢ Caused by the pulling or the plucking of yarn from the, fabric surface, by sharp objects.

❑ **Remedies:**
➢ Inspect & rectify the fabric contact points on all the machines (Soft Flow Dyeing, Tumble Dryer & Centrifuge etc), on which snagging is taking place.

❑ **Bowing**

❏ **Definition:**
Bowing appears as rows of courses or yarn dyed stripes forming a bow shape along the fabric width.

Causes:

➢ Uneven distribution of tensions across the fabric width while dyeing or finishing the fabric.

❏ **Remedies:**

➢ Bowing can be corrected by reprocessing the fabric by feeding it from the opposite end.
➢ A special machine (MAHLO) is also available for correcting the bowing in the knitted fabrics.

❏ **Dyeing Patches**

❏ **Definition:**
Dyeing patches appear, as random irregular patches on the surface of dyed fabrics.

Causes:

➢ Inadequate Scouring of the grey fabric is one of the primary causes of the dyeing patches.
➢ Improper leveling agent is also one of the causes of dyeing patches.
➢ Correct pH value not maintained.

➢ Dyeing machine stoppage due to power failure or the fabric entanglement in the dyeing machine are a major cause of the dyeing patches.

❏ **Remedies:**

• Scour the grey fabric thoroughly to remove all the impurities from the fabric before dyeing.
• Use appropriate leveling agents to prevent patchy dyeing.
• Maintain the correct pH value during the course of dyeing.
• Use a power back up (Inverter) for the dyeing operation to be completed uninterrupted.

❏ **Softener Marks**

❑ **Definition:**
Softener marks appear as distinct irregular patches in the dried fabric after the application of softener.

Causes:

➤ Softener not being uniformly dissolved in water

❑ **Remedies:**

➤ Scour the grey fabric thoroughly to remove all the impurities from the fabric before dyeing.
➤ Ensure that the softener is uniformly dissolved in the water & doesn't remain undissolved as lumps or suspension.
➤ Use the right softener & the correct procedure for the application.
➤ Maintain the correct pH value of the softener before application.

❑ **Color Fading (Poor Color Fastness)**

❑ **Definition:**
The color of the garment or the fabric appears lighter & pale in comparison to the original color of the product after a few uses.

Causes:

➤ Dyeing recipe i.e. the poor fixing of the dyes is a major cause of color fading.
➤ Using the wrong combination of colors in a secondary or tertiary shade.
➤ Use of strong detergents & the quality of water are also the common causes for color fading.
➤ Prolonged exposure to strong light will also cause the colors to fade.
➤ High level of acidity or alkalinity in the perspiration of individuals also causes color fading.

❑ **Remedies:**

➤ Use the correct dyeing recipe i.e. the appropriate leveling, fixing agents & the correct combination of dyes.
➤ Follow the wash care instructions rigidly.
➤ Use mild detergents & soft water for washing the garments.

➢ Don't soak the garments for more than 10- 15 minutes in the detergent prior to washing
➢ Turn the wet garments inside out while drying.
➢ Dry in shade & not in direct sunlight.
➢ Protect the garments against prolonged direct exposure to strong lights (show rooms or exhibitions etc.).

❑ **Shade Variation**

Definition:

Sometimes there appears to be a difference in the depth of shade between the roll to roll & from place to place in the same roll. The defect will show up clearly in the garments manufactured from such fabric.

Causes:

➢ Shade variation can be as a result of mixing of the, fabrics of two different lots.
➢ Shade variation is also caused, by the variation in the process parameters i.e. Time, Temperature & Speed etc. from one fabric roll, to the other.
➢ Shade variation can appear to be, in fabrics with GSM variation, caused due to the uneven stretching, unequal fabric overfeed % etc.

Remedies:

➢ Ensure that the grey fabric used for one shade is knitted from the same lot of the yarn.
➢ Ensure that the same process parameters (Width, Overfeed, Temperature & Machine Speed etc.) are used for each roll of a dye lot.

❑ **Tonal Variation**

❑ **Definition:**
   Roll to roll or within the same roll difference in the color perception i.e. Greenish, Bluish, Reddish or Yellowish etc. is attributed as tonal variation in the shade.

   Causes:

➢ Wrong Dyeing recipe
➢ Wrong leveling agent selection or wrong dyes combinations.
➢ Improper fabric Scouring.
➢ Impurities like Oil & Wax etc. not being completely removed in Scouring
➢ Level dyeing not being done due to the inappropriate leveling agents.

➢ Variation in the process parameters, e.g. Temperature, Time & Speed etc .

❑ **Remedies:**

➢ Use appropriate leveling agents to ensure uniform & level dyeing.
➢ Scour the grey fabric thoroughly to ensure the removal of all the impurities.
➢ Ensure that the whole lot of the dyed fabric is processed under uniform process parameters.

❑ **Wet Squeezer Marks**

❑ **Definition:**
The fabric on the edges of the fabric tube gets permanent pressure marks due to the hard pressing by the squeezer rolls. These marks appear as distinct lines along the length of the fabric & can't be corrected.

Causes:

➢ These marks are caused due to the excessive pressure, of the squeezer rolls of the Padding Mangle, on the wet fabric, while rinsing.

❖ **Remedies:**

➢ Use the Padding mangle only for the application of the softener.
➢ Use a hydro extractor (Centrifuge) for the extraction to avoid the squeezer roll marks.
➢ Soon after extraction open the fabric manually to prevent crease marks in the damp fabric.

❑ **Folding Marks**

❑ **Definition:**
Fold marks appear as distinct pressure marks along the length of the fabric.

Causes:

➢ High pressure of the fabric Take Down rollers of the Knitting machine on the grey fabric is one of the main causes.

> Too much pressure of the feeding rolls of the Calander& Compactor is the primary cause of the folding marks in the knitted fabric.

❖ **Remedies:**

> Adjust the gap between the two rolls as per the thickness of the fabric sheet.
> Gap between the two Calander rolls should be just enough to let the rolls remove the wrinkles in the fabric but put no pressure on the fabric sheet especially in the case of Pique & structured fabrics.

Crease Marks

Definition:
Crease marks appear in the knitted fabric, as dark haphazard broken or continuous lines.

Causes:

- Damp fabric moving at high speed in twisted form, in the Hydro extractor (Centrifuge)

Remedies:

- Use anti Crease, during the Scouring & the Dyeing process .
- The use of anti Crease, swells the Cellulose & prevents the formation of Crease mark.
- Spread the fabric in loose & open form & not in the rope form, in the Hydro Extractor.

High GSM Variation

Definition:
The fabric will appear to have a visible variation in the density, from roll to roll or within the same roll of, the same dye lot.

Causes:

- Roll to roll variation in the, process parameters, of the fabric, like; Overfeed & Width wise stretching of the dyed fabric, on the Stenter, Calender& Compactor machines.
- Roll to roll variation in the fabric stitch length.

Remedies:

- Make sure that all the fabric rolls in a lot, are processed under the same process parameters.
- The Knitting Machine settings, like; the Quality Pulley diameter etc. should never be disturbed.

➢ **Fabric Width Variation**

Definition:
Different rolls of the same fabric lot, having difference in the finished width of the fabric.

Causes:

- Grey fabric of the same lot, knitted on different makes of Knitting Machines, having varying number of Needles in the Cylinder.
- Roll to roll difference, in the Dyed Fabric stretched width, while feeding the fabric on the Stenter, Calander& Compactor.

Remedies:

➢ The whole lot of the grey fabric should be knitted on the same make of knitting machines.
➢ For the same gauge & diameter of the knitting machines, there can be a difference of as high as 40 needles, from one makes to the other make of the machine.
➢ This difference, in the number of needles, causes a difference of upto 2"-3" in the finished width of the fabric
➢ The stretched width of the grey fabric should remain constant, during finishing on the stenter.
➢ **Measurement Problems**

Definition:
The measurements of the garments totally change after, a few hours of relaxation & after the first wash. The arm lengths or the front & back lengths of the garments may vary, due to the mix up of the parts.

Causes:

- Shrinkage caused due to the inadequate relaxation of the knitted fabrics, before cutting.
- Mixing of the garment parts cut from, different layers or different rolls of the knitted fabric.

Remedies:

- Use a trolley, for laying the fabric on the table, to facilitate a tension free, laying.
- Let the fabric relax for a few hours, before cutting, especially the Lycra fabrics.
- Ensure the numbering of the different layers of the fabric, to prevent the mix up of the components.

3.2.Cutting Section

Cutting is the first step and very critical step for garments production. The wastage during cutting is an important issue. Cutting faults can be occurred which should be minimized.

3.2.1. Intensity problem (%):

❑ **Daily cutting part inspection report:**

Date	Total qty	Checked qty	Fault							Total fault	q.c pass	Reject %	Re-place
			SL	HL	NL	CR	CS	OS	YC				
07/02/15	12033	12033	52	326	83	46	50	-	-	557	11476	4.6%	557
08/02/15	11274	11274	44	303	118	64	18	-	14	561	10713	4.9%	561

10/02/15	16184	16184	54	371	191	50	25	-	-	691	15493	4.27%	691
11/02/15	24292	24292	35	733	160	73	68	-	-	1069	23223	4.40%	1069
12/02/15	10392	10392	19	280	59	20	156	-	-	542	9850	5.22%	542
13/02/15	153666	15366	51	255	72	62	132	-	-	663	14703	4.31%	663
Total			255	2268	683	315	449		14	4083			

❑ Among this six days the total no. of fault is=4083

The total no. of hole is, 2268

The total no. of slub is,255

The total no. of crease mark is, 315

The total no. of needle line is,683

The total no. of yarn contamination is,14

The total no. of color spot is,449

❑ <u>Expressed in percentage:</u>

Hole = 55.55%

Slub=6.25%

Crease mark=7.71%

Needle line=16.73%

Yarn contamination=.34%

Color spot=11%

3.2.2 Figure :

Photo of report

UNIT-0...

Buyer	Style No	Fabric name	Total Qty	Checked Qty	YC	SL	HL	NL	OS	LM	CR	DS	US	CS	Total faults	Q.C pass	% of Reject	Types of cut pcs	Replace
									Fabric faults										
BGEX	MABOT	S.J	5622	5622	r	3	189	32	-	r	18	-	-	.	242	5380	4.30%	F+B	242
KEMIA	2002153	TERRY	1440	1440	r	-	22	12	-	.	8	-	r	9	51	1389	3.54%	F.B	51
BRU	355544	Inter	800	800	-	.	11	8	-	r	2	-	r	.	21	779	2.63%	u	21
"	355546	"	2200	2200	-	8	18	24	-	.	9	.	.	8	67	2135	3.05%	u	67
"	355545	"	4455	4455	-	13	19	82	r	-	15	.	.	15	144	4311	3.23%	F	144
	TOTAL=		14517	14517	r	24	259	158	.	-	52	-	r	32	525	13992	3.62%		525

UNIT-02

Buyer	Style No	Fabric name	Total Qty	Checked Qty	YC	SL	HL	NL	OS	LM	CR	DS	US	CS	Total faults	Q.C pass	% of Reject	Types of cut pcs	Replace
BGEX	MAB02	S.J	12576	12576	r	11	421	68	-	-	28	-	.	-	528	12048	4.20%	F.S	528
"	MCA15	"	2128	2128	r	-	59	19	-	-	8	-	r	-	86	2042	4.04%	F.B	86
u	LCA51	"	7788	7788	-	24	204	59	-	-	32	.	.	68	387	7401	4.97%	u	387
KEMIA	2005854	TERRY	1800	1800	r	-	49	14	-	-	5	-	.	-	68	1732	3.78%	B+E	68
	TOTAL=		24292	24292	-	35	733	160	-	-	73	r	-	68	1069	23223	4.40%		1069

Name of fabric faults

YC-yarn contamination	LM-Lycra missing	HL-Hole
SL-Slub	CR-Crease mark	NL-Needle line
US-Uneven shading	DS-Dye stain	OS-Oil stain
CS-Color spot		

Jul 29, 2015

❖ <u>Sequence of cutting:</u>

- ➢ Work order sheet.
- ➢ Certification of assortment.
- ➢ Pattern receiving from pattern section
- ➢ Pattern checking.
- ➢ Marker making (According to assortment or order sheet).
- ➢ Marker checking.
- ➢ Determine the quality of spreading cloth
- ➢ Calculate the number of layer per cutting.
- ➢ Number of cutting per order.
- ➢ Receiving fabric from store or dyeing finishing
- ➢ Fabric spreading putting marker paper
- ➢ Cutting

❖ Cutting faults are:

- ➢ Faulty pattern pieces
- ➢ Faulty marker paper
- ➢ Faulty machine
- ➢ Faulty table
- ➢ Ends of ply losses
- ➢ Selvedge losses
- ➢ Loss of fabric ends
- ➢ Purchase loss.
- ➢ Uneven cutting.

3.2.3. Definition of Faulty pattern pieces:

Fault pattern pieces is an incorrect pattern which is made. It isdefined as wrong pattern. When the measurement will be incorrect then we can call faulty pattern pieces.

3.2.4. Causes:

- ➢ It can be wrong measurement.
- ➢ Unskilled designer.
- ➢ Pattern paper can be damaged.

3.2.5. Remedies:

➤ We can must be used right measurement.
➤ Skilled designer.
➤ Well marker paper should be used.

3.2.6. Definition of Faulty marker paper:

Fault marker paper is an incorrect marker which is made. It is defined as wrong marker. When the measurement will be incorrect then we can call faulty marker paper.

3.2.7.Causes:

➤ If faulty pattern uses then marker will faulty.
➤ Damaged used can be marker.

3.2.8.Remedies:

➤ We have usedproper marker paper.
➤ Sketch should be proper.
➤ Fresh marker should be used.

3.2.9. Definition of Faulty machine:

There are the important problem in cutting section. For the faulty cutting machine, cutting will be incorrect and uneven.

3.2.10. Causes:

➢ Old machine cannot be run properly.
➢ Blade should be sharp.
➢ Strength will be high.

3.2.11Remedies:

➢ New machine should be used.

3.2.12. Definition of Faulty table:

Faulty tables also an important problem. When the table will be unsmooth, then cutting will be uneven.

3.2.13. Causes:

➢ Unsmooth table use.

3.2.14. Remedies:

➢ Smooth table use. Proper size of table.

3.3. Sewing Section:

The basic process of sewing involves fastening of fabrics, leather, furs or similar other flexible materials with the help of needle and threads. Sewing is mainly used to manufacture clothing and home furnishings. In fact, sewing is one of the important processes in apparel making. Most of

such industrial sewing is done by industrial sewing machines. The cut pieces of a garment are generally tacked, or temporarily stitched at the initial stage. The complex parts of the machine then pierces thread through the layers of the cloth and interlocks the thread.

❑ Objective:

This project paper defines frequently occurs the sewing defects and way to prevent breakage thread.

- To know causes of thread defects and its remedies.
- To implement technical solution toward thread defects.
- To prepare a guideline which will assists the technical person in the relevant field.
- To show how technical know-how can increase production efficiency.

3.3.1. Intensity problem (%):

Quality checking for sewing per hour in six days:

Date: 20/06/15

Check qty.	Ok qty.	Defect qty.	Rectify RCVD qty.	Reject qty.
107	100	07	05	-
190	180	10	12	-
129	120	08	07	01
202	190	12	13	-
159	150	09	08	-
167	160	06	06	01
296	180	15	16	01

340	320	20	17	-
262	250	12	14	-
265	259	14	15	01

Total Daily checked:

2117	2000	113	113	04
Check qty.	Ok qty.	Defect qty.	Rectify RCVD qty.	Reject qty.
19/06/15				
1264	1200	61	61	03
18/06/15				
547	500	45	45	02
17/06/15				
764	700	60	60	04
16/06/15				
667	600	64	64	03
15/06/15				
2449	2300	146	146	03

Fault name	**No. of fault**		**%**
Skip stitch (C):	99	=(99÷509)×100	=19.44%
Leg opening up down (T):	13	=(13÷509)×100	=2.55%
Oil spot(Y):	74	=(74÷509)×100	=14.53%
Reject (AB):	21	=(21÷509)×100	=4.12%
Label slanted (AG):	78	=(78÷509)×100	=15.32%
Neck binding lob un-even (A	48	=(48÷509)×100	=9.43%
Print spot(AA)	20	=(20÷509)×100	=3.92%
Hem skips (F)	43	=(43÷509)×100	=8.44%

Dirty spot (Z)	53	=(53÷509)×100	=10.41%
Arm hole up-down(N)	19	=(19÷509)×100	=3.73%
Neck top stitch un-even(B)	21	=(21÷509)×100	=4.12%
Back front I	20	=(20÷509)×100	=3.92%
Total fault	**509**		

3.3.2. Photo:

❖ Sequence of sewing section a basic knitted T-Shirt:

1. Shoulder joint: Overlock Machine

2. Rib making: Overlock 3 thread.

3. Rib joint /Neck joint: Overlock Machine.

4. Back Tape Seam: Flat lock machine.

5. Neck Tape Seam: Flat Lock Machine.

6. Back Tape Joint: Flat lock Machine.

7. Back Tape Top Seam: Plain stitch Machine.

8. Sleeve Joint: Over Lock Machine.

9. Side Seam: Over Lock Machine.

10. Sleeve Hem: Flat lock Machine.

11. Bottom Hem: Flat Lock Machine.

❖ Sewing fault:

➢ Open seam at sleeve joint
➢ Staggered stitch
➢ Skip stitch at button hem
➢ Neck joint open fault
➢ Joint stitch uneven
➢ Sleeve joint royest
➢ Main level side slanked
➢ Body hem single stitch
➢ Without neck top stitch
➢ Uncut thread
➢ Care level up down (10 cm)
➢ Care level wrong side
➢ Loop opening
➢ Open seam at side.
➢ Machine tension problem

- ➤ Size mistake.
- ➤ Neck joint uneven
- ➤ Sleeve joint puckering
- ➤ Puckering at button hem
- ➤ Feed cut.

3.3.3. Definition of Open seam at sleeve joint:

When the sleeve will open from the body for faulty seam, then its called Open seam at sleeve joint.

3.3.4. Causes:

- ➤ It is the sewing faultofa sewing machine.
- ➤ When the part of sleeve will be opened by some mistake.
- ➤ Wrong tension of sewing thread.
- ➤ Uneven edges.

3.3.5. Remedies:

- ➤ Setting of proper tension to the sewing thread
- ➤ Use of right thread path.

3.3.6. Figure:

3.3.7. Definition of Staggered stitch:

The stagger stitch reduces the thread build up along the book spine by alternating the thread position.

3.3.8. Causes:

- ➢ Needle deflection
- ➢ Due to wrong or blunt needle point
- ➢ Wrong adjustment of needle and thread size
- ➢ Defected motion of feed dog

3.3.9. Remedies:

- ➢ Increase the needle size
- ➢ Needle to be changed
- ➢ Needle size and thread size to be changed
- ➢ Motion of feed dog to be adjusted

3.3.10. Definition of Unbalance stitch:

It is unbalancing stitch when sewing.

3.3.11. Causes:

- ➢ Wrong tension of sewing thread
- ➢ Used wrong thread path
- ➢ Wrong adjustment of needle thread path
- ➢ If the thread is not lubricated

3.3.12. Remedies:

- ➢ Setting of proper tension to the sewing thread
- ➢ Use of right thread path
- ➢ Better qualities threads must be used

3.3.13. Figure:

3.3.14. Definition of Variable stitch density:

During sewing improper unwinding of thread from package and for high tension become stitch will uneven and its uneven density.

3.3.15. Causes:

➤ Twisting of thread in the thread guide
➤ More tension to the thread
➤ Improper unwinding of thread from package during sewing
➤ Fraying of thread in the needle

3.3.16. Remedies:

➤ Proper threading of sewing thread during sewing

- The tension of thread should be less or use of higher strength threads
- The position of thread guide must be 2.5 times higher than the position of thread package.
- Finer threads must be used or to be used heavy needle.

3.3.17 Figure:

3.3.18. Definition of Skipped Stitches:

Skipped stitch means that one stitch will be missed by tension or faulty needle it's called Skipped Stitches

3.3.19 Causes:

- Hook, looped or needle failing to enter thread loops at the correct time.
- Needle deflections or bent needle.
- Incorrect sewing tension in the needle or under threads.

3.3.20. Remedies:

- Check machine clearances and timings. Check if the needle is inserted and aligned correctly. Use a needle with a deeper scarf.
- Use a reinforced needle, reset the needle guard and replace the needle.
- Re-adjust the tensions.

3.3.21. Definition of Seam Pucker:

3.3.22. Causes:

- Variable differential fabric feed.
- High thread tension.
- Incorrect thread balance.
- Improper thread type.

3.3.23. Remedies:

- Improve the fabric feed mechanism. Replace worn out feed dogs. Reduce the maximum sewing speed.
- Keep the bobbin tension as low as possible and set the needle thread tension accordingly.
- Ensure proper balance between the top and bottom thread.
- Use threads with controlled elongation. Properly maintain tension guides.

3.3.23. Figure:

3.4.Finishing section:

3.4.1.Intensity problem %

Quality check report per hour in six days:

For finishing unit:

Date:24/05/15

Check qty.	Ok qty.	Defect qty.	Rectify RCVD qty.	Reject qty.
127	120	07	6	-
116	111	5	4	-
118	112	06	05	-
130	122	8	11	-
132	125	07	06	-
123	115	8	7	-
140	130	10	12	-
142	133	9	7	-
132	126	8	6	1
145	135	10	12	1
Daily checked:				
1307	1229	78	76	02
23/05/15				
1304	1232	72	70	02
22/05/15				
1320	1246	74	70	02
21/05/15				
1485	1400	85	81	04
20/05/15				
1293	1218	75	72	03
19/05/15				
1233	1159	74	72	02

Total		458		

Express as percentage

Fault name	No. of fault		% of fault
Skip stitch (C):	67	=(67÷458)×100	=14.62
Oil spot(Y):	44	=(44÷458)×100	=9.60%
Reject (AB):	35	=(35÷458)×100	=7.64%
Drawcord up-down (AD):	23	=(23÷458)×100	=5.02%
Bottom hem uneven D	14	=(14÷458)×100	=3.05%
Print spot(AA)	62	=(62÷458)×100	=13.53%
Hem skips (F)	17	=(17÷458)×100	=3.71%
Dirty spot (Z)	94		=20.52%
Bottom rib shade W	17	=(17÷458)×100	=3.71%
Embroidery problem H	21	=(21÷458)×100	=4.58%
Both sleeve up down R	14	=(14÷458)×100	=3.05%
Hem puckering E	25	=(25÷458)×100	5.45%
Side seam uneven G	25	=(25÷458)×100	5.45%
Total fault	**458**		

3.4.2.Figure:

Photo on daily report:

Finishing flow chart:

Fabric receive
↓
Quality checking
↓
Counting
↓
Measurement check
↓
Get up check
↓
Needle check
↓
Price sticker
↓
Quality check (label)
↓
Pound sticker
↓
Folding
↓
Poly
↓
Transit label
↓
Packaging
↓
Final check
↓
Carton

❑ Object of finishing:

➢ Improve the dimensional stability of the garments.
➢ Modify the handle of garments.
➢ Improve the appearance of the garments.
➢ Modify the service ability of the garments.
➢ Improve the durability of the garments.

❑ **Quality inspection point during finishing:**

1. Broken stitch.
2. Skip stitch
3. Side seam open
4. Down stitch
5. Point up down
6. Joint up down
7. Bottom length up down
8. Label mistake.
9. Size mistake
10. Tuck mistake
11. Without tuck
12. Puckering
13. Shoulder up down
14. Sleeve up down
15. Wrong side label joint
16. Without barteck
17. Shading
18. Needle mark
19. Oil spot
20. Dirty spot
21. Fabric fault

3.4.3. Definition of Fabric Hole:

Drop Stitches are randomly appearing small or big holes of the same or different size which appear as defects in the Knitted fabrics.

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3.4.4. Causes:

➢ Broken needle.
➢ Improper cleaning.
➢ Yarn breakage at knot.
➢ Very high yarn twist.

3.4.5. Remedies:

- ➢ Properly machine cleaning.
- ➢ Dust removes by air gun.
- ➢ Needle broken check.

3.4.6. Figure:

3.4.7. Definition on Needle line:

Needle lines are prominent vertical lines along the length of the fabric which are easily visible in the grey as well as finished fabric.

3.4.8. Figure:

3.4.9. Causes:

➢ Bent Latches, Needle Hooks & Needle stems
➢ Wrong Needle selection (Wrong sequence of needles, put in the Cylinder or Dial)

3.4.10. Remedies:

➢ Inspect the grey fabric on the knitting machine for any Needle lines.
➢ Check the Needle filling sequence in the Cylinder / Dial grooves (tricks)

3.4.11. Definition of loop:

This may take the form of a shadow (several courses involved) or a discreet line (one course involved). It will normally show up as a dark or dense line or shadow

3.4.12. Causes:

- ➢ Missing feeder of the yarn.
- ➢ Fly or Dust contains.

3.4.13. Remedies:

- ➢ Properly yarn is passing to the feeder.
- ➢ Removed dust from the air gun.

3.4.14. Definition Softener Marks :

Softener marks appear as distinct irregular patches in the dried fabric after the application of softener.

3.4.15. Causes:

- ➢ Softener not being uniformly dissolved in water

3.4.16. Remedies:

- ➢ Scour the grey fabric thoroughly to remove all the impurities from the fabric before dying.
- ➢ Ensure that the softener is uniformly dissolved in the water & doesn't remain undissolved as lumps or suspension.
- ➢ Use the right softener & the correct procedure for the application.
- ➢ Maintain the correct pH value of the softener before application.

3.4.17. Definition of Stains:

Stains appear as spots or patches of grease oil or dyes of different color, in a neat & clean finished fabric surface.

3.4.18. Figure:

3.4.19. Causes:

➢ Dyeing Machine not cleaned thoroughly after dyeing a lot.

➢ Grease & Oil stains from the unguarded moving machine parts like; Gears Shafts Driving Pulleys & Trolley wheels etc.
➢ Fabric touching the floors & other soiled places during transportation, in the trolleys.
➢ Handling of the fabric with soiled hands & stepping onto the stored fabric with dirty feet or shoes on.

3.4.20. Remedies:

➢ Wash & clean the dyeing machine thoroughly after dyeing every dye lot.

- Follow the dyeing cycle of Light- Medium- Dark shades & then the reverse the cycle while dyeing the fabric.
- All the lubricated moving machine parts should be protected with safety guards.
- Make sure that the fabric is neatly packed in or covered with Polythene sheets while transporting or in storage.
- Handle the fabric carefully with clean hands & do not let anyone step onto the stored fabric.

3.4.21. Definition of Shade variation:

- Its means that the variation of shade of dyeing machine.

3.4.22. Causes:

- Dyeing Machine not cleaned thoroughly after dyeing a lot.

- Grease & Oil stains from the unguarded moving machine parts like; Gears Shafts Driving Pulleys & Trolley wheels etc.
- Fabric touching the floors & other soiled places during transportation, in the trolleys.

- Causes uneven to batch missing shade.
- Different batch mixing for same garments.

3.4.23. Remedies:

- One batch fabric shade is used for same garment in every part.
- Shade is marking each part due to fabric cutting.

3.4.24. Figure:

3.4.25. Definition of Seam tears:

➢ When the seam will tear then we can say that seam tear.

3.4.26. Causes:

➢ Frequently caused by the turning equipment used tore verse garments in finishing.

3.4.27. Remedies:

➢ Seam stitch is again where place seam tears.

3.4.28. Figure:

3.4.29. Definition of Shrinkage:

Shrinkage is the subject of many customer complaints. Some customers may complain because they believe the cleaner will find it difficult either to dispute the claim that the garment has shrunk or to disown responsibility because the garment has shrunk while in the business's care.

3.4.30. Causes:

➢ Short fiber yarn create shrinkage problem on to the fabric.
➢ High twisted yarn or thread is the reason of shrinkage.

3.4.31. Remedies:

➢ Steam is used in dryer.
➢ Batter quality yarn shrinkage problem reduce.

3.4.32. Definition Oil Stains:

Stains appear as spots or patches of grease oil or dyes of different color, in a neat & clean finished fabric surface.

3.4.33. Causes:

➢ Dyeing Machine not cleaned thoroughly after dyeing a lot.

➢ Grease & Oil stains from the unguarded moving machine parts like; Gears Shafts Driving Pulleys & Trolley wheels etc.
➢ Fabric touching the floors & other soiled places during transportation, in the trolleys.
➢ Handling of the fabric with soiled hands & stepping onto the stored fabric with dirty feet or shoes on.

3.4.34. Remedies:

➢ Wash & clean the dyeing machine thoroughly after dyeing every dye lot.
➢ Follow the dyeing cycle of Light- Medium- Dark shades & then the reverse the cycle while dyeing the fabric.
➢ All the lubricated moving machine parts should be protected with safety guards.
➢ Make sure that the fabric is neatly packed in or covered with Polythene sheets while transporting or in storage.
➢ Handle the fabric carefully with clean hands & do not let anyone step onto the stored fabric.

4. Result and Discussion:

Total fault of finished fabric inspection in six days: 315

Express as %

No. of hole= 193   =(193÷315)×1000=61.26%

No. of yarn contamination= 18   =(18÷315)×1000=5.71%

No. of oil stain=26   =(26÷315)×1000=8.25%

Dye stain: 27   =(27÷315)×1000=8.57%

No. of lycra missing: 51   =(51÷315)×1000=16.19%
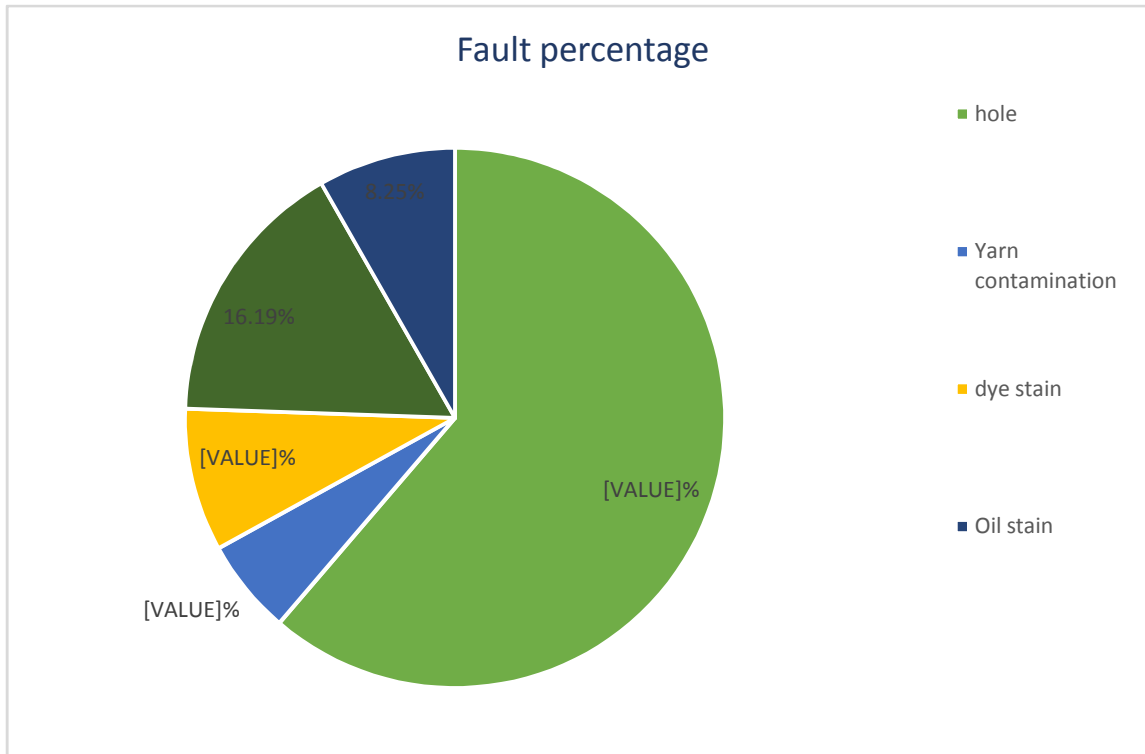
Pie Chart of Faults:

Fig- Graphical representation of faults per day

In this graph, pie chart indicate the "Name of finished fabric faults" and indicates the percentage of fault". Here we can see 4 types of finished fabric faults. Among them, the maximum no. of finished fabric faultholethe minimum no. of finished fabric fault is mechanical damage.

So, this fault should check in the industry to increase the production.

Result of Cutting section:

❑ Daily cutting part inspection report:

Date	Total qty	Checked qty	Fault							Total fault	q.c pass	Reject %	Re-place
			SL	HL	NL	CR	CS	OS	YC				
07/02/15	12033	12033	52	326	83	46	50	-	-	557	11476	4.6%	557
08/02/15	11274	11274	44	303	118	64	18	-	14	561	10713	4.9%	561
10/02/15	16184	16184	54	371	191	50	25	-	-	691	15493	4.27 %	691
11/02/15	24292	24292	35	733	160	73	68	-	-	1069	23223	4.40 %	1069
12/02/15	10392	10392	19	280	59	20	156	-	-	542	9850	5.22 %	542
13/02/15	153666	15366	51	255	72	62	132	-	-	663	14703	4.31 %	663
Total			255	2268	683	315	449		14	4083			

❑ Among this six days the total no. of fault is=4083

The total no. of hole is, 2268

The total no. of slub is, 255

The total no. of crease mark is, 315

The total no. of needle line is, 683

The total no. of yarn contamination is, 14

The total no. of color spot is, 449

❑ Expressed in percentage:

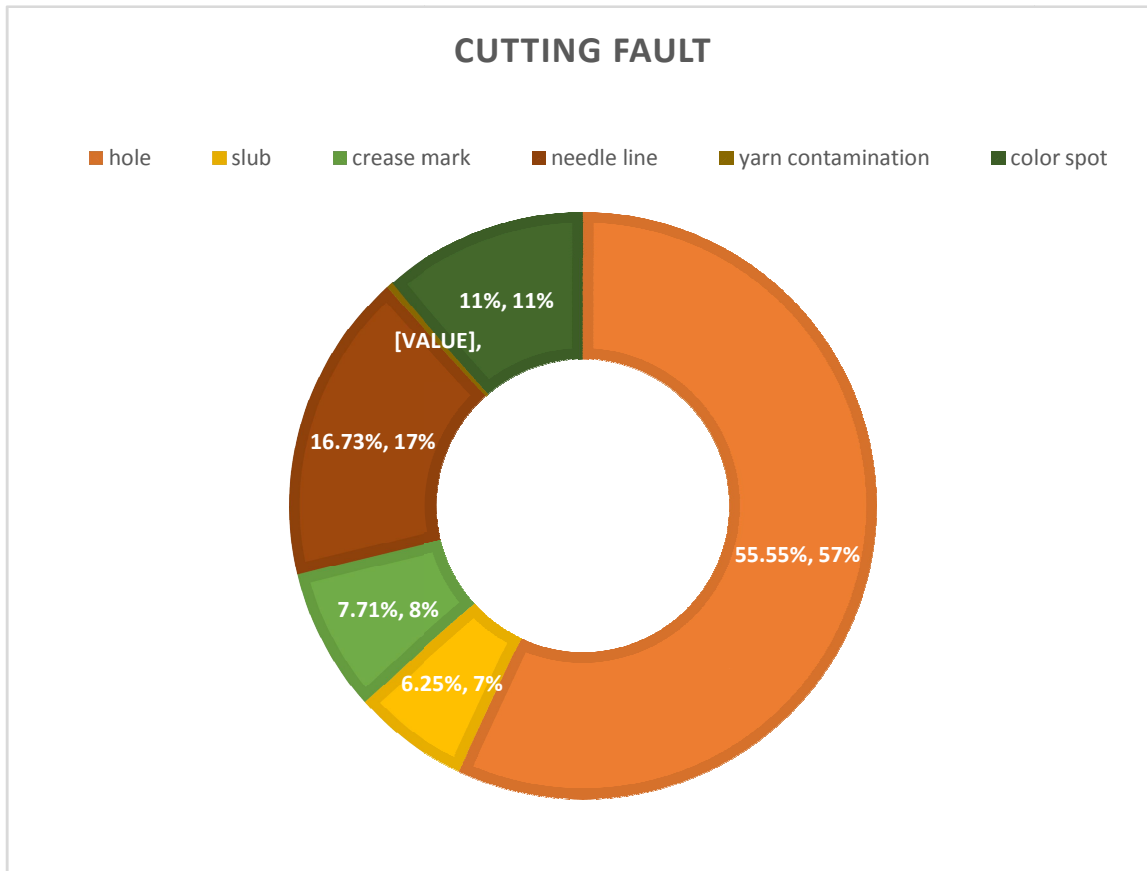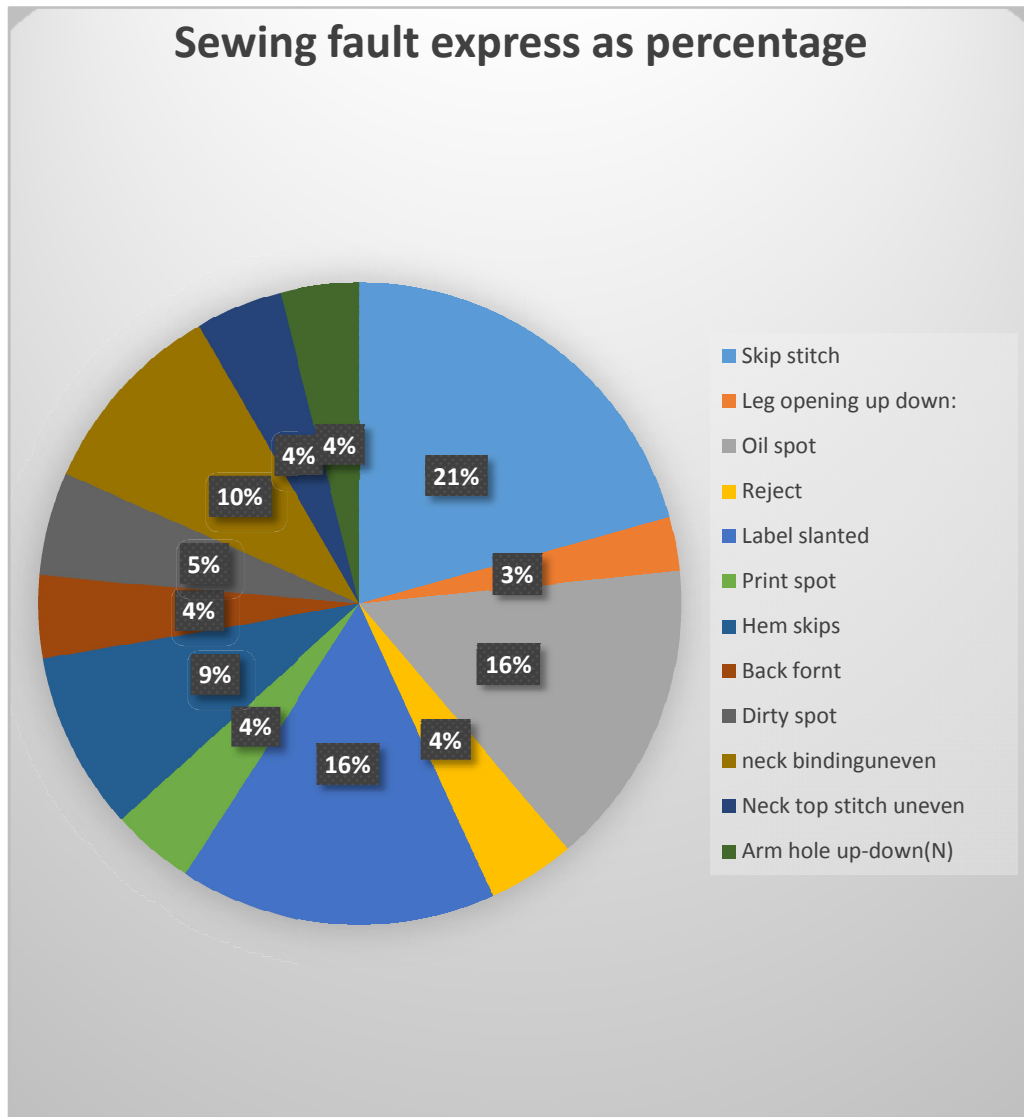| Fault name	Fault Percentage
Hole	55.55%
Slub	6.25%
Crease marl	7.71%
Needle line	16.73%
Yarn contamination	.34%
Color spot	11%

Pie Chart of cutting faults:

Fig- Graphical representation of faults per day

In this graph, pie chart indicate the "Name of Cuttinginspection faults" and indicates the percentage of fault". Here we can see 5 types of cutting inspection faults. Among them, the maximum no. of cutting inspection faulthole the minimum no. of cutting inspection fault is mechanical damage.

Sewing fault measurement:

Fault name	No. of fault		Fault %
Skip stitch (C):	99	=(99÷509)×100	=19.44%
Leg opening up down (T):	13	=(13÷509)×100	=2.55%
Oil spot(Y):	74	=(74÷509)×100	=14.53%
Reject (AB):	21	=(21÷509)×100	=4.12%
Label slanted (AG):	78	=(78÷509)×100	=15.32%
1.Neck binding lob uneven (A	48	=(48÷509)×100	=9.43%
Print spot(AA)	20	=(20÷509)×100	=3.92%
Hem skips (F)	43	=(43÷509)×100	=8.44%
Dirty spot (Z)	53	=(53÷509)×100	=10.41%
Arm hole up-down(N)	19	=(19÷509)×100	=3.73%
Neck top stitch un-even(B)	21	=(21÷509)×100	=4.12%
Back front I	20	=(20÷509)×100	=3.92%
Total fault	**509**		

Chart of sewing section:

Sewing fault express as percentage

■ Skip stitch	
■ Leg opening up down:	
■ Oil spot	
■ Reject	
■ Label slanted	
■ Print spot	
■ Hem skips	
■ Back fornt	
■ Dirty spot	
■ neck bindinguneven	
■ Neck top stitch uneven	
■ Arm hole up-down(N)	

21% 3% 16% 4% 16% 4% 9% 4% 5% 4% 10% 4% 4%

Graphical representation of faults per day

In this graph, the indicates the "Name of sewing faults" and indicates the percentage of fault". Here we can see 9 types of sewing faults. Among them, the maximum no. of sewing fault skip stitch & the minimum no. of sewing fault is mechanical damage.

Quality check report per hour:

For finishing unit:

Express as percentage

Fault name	No. of fault		% of fault
Skip stitch (C):	67	=(67÷458)×100	=14.62
Oil spot(Y):	44	=(44÷458)×100	=9.60%
Reject (AB):	35	=(35÷458)×100	=7.64%
Drawcord up-down (AD):	23	=(23÷458)×100	=5.02%
Bottom hem uneven D	14	=(14÷458)×100	=3.05%
Print spot(AA)	62	=(62÷458)×100	=13.53%
Hem skips (F)	17	=(17÷458)×100	=3.71%
Dirty spot (Z)	94		=20.52%
Bottom rib shade W	17	=(17÷458)×100	=3.71%
Embroidery problem H	21	=(21÷458)×100	=4.58%
Both sleeve up down R	14	=(14÷458)×100	=3.05%
Hem puckering E	25	=(25÷458)×100	5.45%
Side seam uneven G	25	=(25÷458)×100	5.45%
Total fault	**458**		

Chart of finishing section:

Finishing fault

- 17.10%
- 5.26%
- 13.15%
- 2.63%
- 2.63%
- 2.63%
- 2.63%
- 1.31%
- 2.63%
- 6.57%
- 19.73%
- 3.94%
- 19.73%

Legend:
- Skip stitch
- side seam uneven
- oil spot
- Reject
- both sleeve up-down
- bottom rib shade
- arm hole up-down
- Hem Puckering
- label slanted
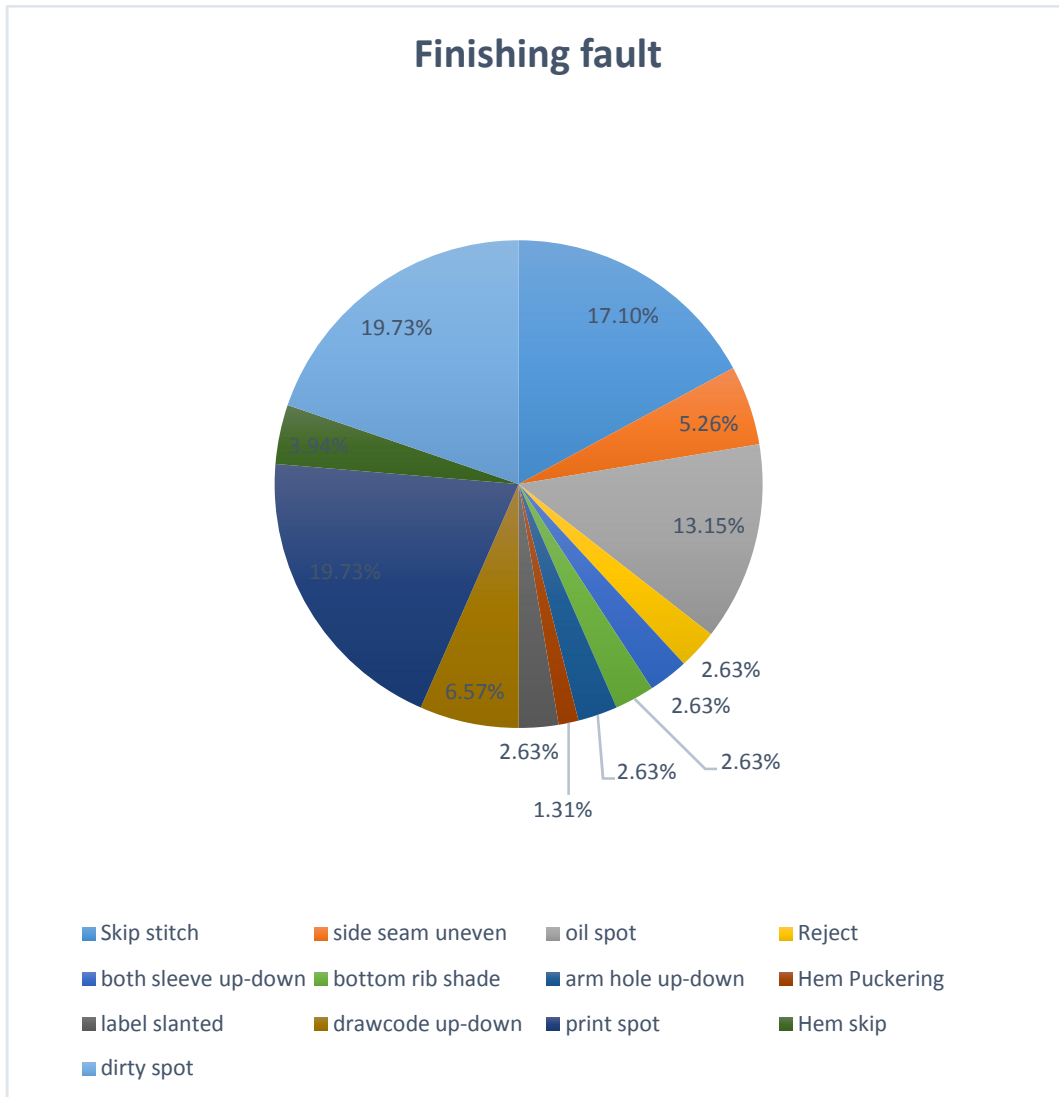- drawcode up-down
- print spot
- Hem skip
- dirty spot

Fig- Graphical representation of faults per day

In this graph, pie chart indicate the "Name of finishing faults" and indicates the percentage of fault". Here we can see 13 types of finishing faults. Among them, the maximum no. of finishing-fault print spot and dirtyspot the minimum no. of finishing fault is mechanical damage.

5. Conclusion:

The project has come to a termination finally after lots of thinking, discussion and our continuous trying. We really have worked hard to complete this project well ahead. We wished to make it as a replica of changes on knit garments quality by removing fault. When the development of the country was at a standstill position due to the legacy of shattered economy and industrialization was stagnant, the export oriented textile and RMG sector had shown the ray of hope by its all-pervasive position impact on the national economy. At the far end of the eighty, this sector started expanding and within a short period of its existence, this nascent industry became the largest foreign exchange earner.

Standing at the verge of a new millennium, Textile and RMG sector is now the heart of the national economy. Even after all this achievement, this industry faces the major challenge of global adjustment in the coming years when it has to respond the new trading arrangement after 2000.

Now a days Textile field become very competitive and the buyer wants 100 % export quality product. For this reason, it is very important to know about the latest technologies in textile sector. To produce a quality Product, as a Textile engineer I must have a vast knowledge about the production Parameters and how to produce high quality product & Techniques of productions and the management system. So that it provides a complete knowledge about investigation on changes on knit garments quality problem for the production Though there were some limitations like shortage of time that compelled us to complete the thesis as soon as possible, even then we have tried to give our best. . In this paper, we can see thatmaximumno.of fault is hole ,skip stitch.dirt spot .oil spot etc are mostly effect on quality on the garments production.

Therefore, we think this project will help us in future.