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Department of Textile Engineering

REPORT ON

“Investigation on the Pre-shipment inspection (PSI) reports in denim garments production”

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DECLARATION

We hereby declare that our project has been done under the supervision Of **Abdullah Al Mamun, Associate Professor, Department of TE, Daffodil International University**. We further declare that this project or any part of this project has not been submitted elsewhere for the award of any degree or diploma. No part of this paper is copied directly from others.

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APPROVAL SHEET

This research entitled ‘ ‘ **Investigation on the Pre-shipment inspection (PSI) reports in denim garments production** " at Daffodil International University, Spring-2024’’ prepared and submitted by **Sukanto Karmaker (212-23-5792) & Md Rahat Hossain Khan, (212-23-5803)** 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.

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Finally, we have to acknowledge the constant support of my parents and patients with due respect.

**DEDICATED
TO
MY BELOVED PARENTS**



ABSTRACT

This project is on **“Investigation on the Pre-shipment inspection (PSI) report in denim garment production”**. The primary focus of this project is final inspection, which is a crucial aspect of the woven industry. This project's inspection method is to test goods on appropriately constructed, well-lit tables in order to identify any flaws in goods or services that a company produces. The product is approved for delivery if there are no faults or if there are defects but they fall within acceptable bounds. The completed product is sent to its intended location. However, many things cannot be transported within the shipment time due to proper knowledge. since it is unable to satisfy customers' needs. The company's reputation is also determined by customer visits. if the business is unable to satisfy a customer's request in the allotted time. Ultimately, the customers do not place any more orders. So if the product is produced in good quality then the buyers will be satisfied.

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1.INTRODUCTION

Bangladesh has started to lead as a key player in the RMG (Readymade Garment) sector. Today, Bangladesh is a well-known name in the global textile trade in terms of export of ready-made garments. About 78% of foreign exchange is earned from this sector. Due to globalization and open marketplaces, competition is growing daily. Therefore, in order to stay competitive, we must improve the quality of our clothing goods by utilizing contemporary machinery and the most recent quality approaches (such as the 4-point system and AQL, among others). The department in question is the quality control department. A high-quality product that meets the expectations of the customer involves all the technical aspects of apparel.

The market is extremely competitive these days. Bangladesh's manufacturers compete fiercely on quality in this cutthroat environment. Consequently, a number of quality testing facilities, including **SGS, TUV, ITS, ATI, SIGNET, HOHENSTEIN**, and others, grow. Another name for them is third parties. Third parties are another term for buyers. These businesses are used by buyers to finish last-minute checks before to shipment. These testing companies take great care to guarantee high-quality products. As a result, clothing firms prioritize product quality above all else in order to please customers and foster positive working relationships.

1.2 Objectives

- To identify and categorize the most common faults
- To understand the underlying reasons behind these faults
- To generate and evaluate a list of corrective actions
- To improve the procedure of the final inspection
- To predict the future faults
- To quantify the financial impact of faults
- To compare the quality to accepted standards in the industry.
- To know the findings and recommendation

1.3 Limitations

- 1) The study focuses solely on faults identified during UFL's final inspection, excluding potential issues in earlier production stages.
- 2) Findings may lack generalizability due to the limited sample size of faults analyzed.
- 3) Insights and recommendations may not extend beyond the denim manufacturing industry.
- 4) The study's findings are time-specific and may not reflect post-data collection changes in UFL's processes.
- 5) Reliability hinges on the completeness and accuracy of quality control data, subject to human error.
- 6) External factors like market trends or raw material prices may not be fully considered.
- 7) Resource limitations may affect the depth and thoroughness of the analysis.
- 8) The study might not fully grasp diverse buyer expectations, impacting corrective actions' effectiveness.

CHAPTER-02

LITERATURE REVIEW

2.1 GARMENTS FINAL INSPECTION AND ITS DEFINITIONS:

Garment Inspection: Inspection is the process of testing a product without using any tools to monitor its quality. Examining materials, stitches, zippers, buttons, threads, measurements of the garment, etc. to make sure they meet requirements or desired standards is called inspection. Every area of the clothing industry has a lot to offer visitors. Finding errors or defects at every level of the clothing production process is the goal of inspection, which also aims to cut costs and time.

The final examination includes assessing the completed item from the consumer's perspective, determining the size, Starting with fitting (wearing the appropriate size garment, checking with a mannequin to make sure the item fits the label size accurately), and if required, live modeling (rechecking that the item fits the labeled size accurately).

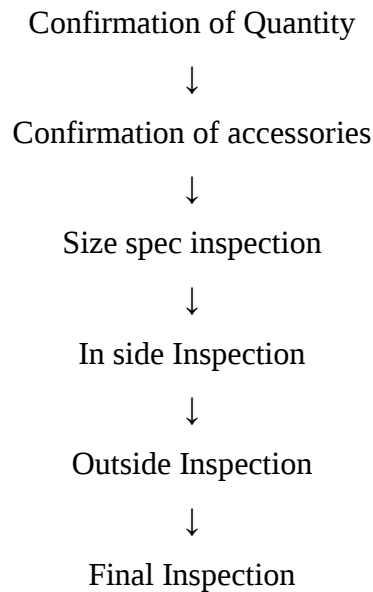
The clothing may be inspected either before or after it is packaged in boxes and poly bags. A list of checked points on a garment with a table of their measurements should be present if this is done after packaging. In any event, the right size and style labeling on the box can also be confirmed.

Generally the garment final inspection process is done by buyer representative or third party authority.

Names of some third party authorities :

- 1. TUV**
- 2. ITS**
- 3. ATI**
- 4. AHL**
- 5. HOHENSTEIN**

2.2. FLOW CHART OF GARMENT INSPECTION



2.3. INSPECTION PROCEDURE OF GARMENTS

1. Confirmation of Quantity:

Counting all of the packs within each box to verify the quantity with the vendor's packing list is the first step in the inspection process for clothing. The seller is notified if the amount differs from what is specified on the box and packing list.

2. Confirmation of accessories:

The next step is accessory confirmation, here we confirm the brand tag, demerit tag, price tag, or other tags, wash care label, woven label or other labels and accessories required by the buyer.

3. Size Special Inspection:

Following accessory confirmation, each PC is examined in accordance with size specifications using the buyer-provided instruction page as a guide. We check the original sample and notify the buyer immediately if any measurement issues are found.

4. On side inspection:

At this stage the garment is checked from the reverse side to ensure that there are no fabric defects, poor stitching and stains etc.

5. Outside inspection:

At this point, the garment is examined from the outside to make sure there are no differences in color, stains, holes, bad stitching, weaving flaws, fabric flaws, printing flaws, or other issues.

6. Final inspection:

The most crucial stage of the inspection process is the final inspection, where defects are detected and placed in the reject pile. The inspection is performed here to make sure that everything is done correctly.

2.3.1 Final Inspection Procedure :

Final Inspection Procedure

It is done to the after pre-final inspection. After pre-final inspection if garment are passed. It will send to final inspection. After final inspection only, the decision of passing or rejecting is made.

- The QA File containing all the information regarding the Style (including all comments from Buyer) has to be kept ready before conducting the Final Inspection. This file has to be kept ready and updated by the Merchandiser.
 - Final Inspection has to be conducted by Buying QC/In-house inspector/Account Responsible Person of the company.
 - The criteria for Final inspection is mentioned below
 - Final inspections must be performed in a Inspection Room.
 - The Inspection Room must have a big table where the controls will take place.
 - The Inspection Room must be lit up by fluorescent tube Daylight = D65, and have TL 83 available. (nearby or over the table, based on different product groups needs according to information from PO.)
 - In this room only concerned people from factory should be present during inspection.
 - Smoking is totally prohibited in the Inspection room
 - The Final Inspection is conducted as per AQL 1.5/25/4.0 level-II, (also as per buyer requirements)
 - Final inspection must take place when a minimum of 80% of the pieces are packed. (80% minimum only for our self-final inspection)
 - The selected cartons are opened and the appearance of the open carton containing garments is observed (garments should not be tightly or loosely packed as it can change the presentation and appearance of the garment when the carton is opened).
 - The carton is checked for ratio as per Contract/ PO Sheet. The garments are checked for Shade (as per the approved Shade Band) hand feel and moisture (as per the wash approved sample & moisture requirement), Quality, Presentation of the product.
 - If the audit is passed, report is filed and preparations are taken for conducted the next Final Inspection.
 - If the audit is failed, the Fail report is prepared and shown to the respective Head of quality, Concern People and The Head of production. The fail pcs are reviewed and necessary corrective action/ decision is taken immediately.
 - The team prepares for next Final Inspection.
 - When all the Final Inspections for a style is passed, then share to final packing list & send mail merchandiser for shipment approval purpose, after get approval then ship all inspected goods.
-

2.4. QUALITY MANAGEMENT

In the global apparel sector, Bangladesh is well-known for its knit and crocheted clothing. However, the market is currently increasing at a considerably faster rate. As a result, competition arises in the market. Bangladeshi manufacturers are highly competitive in this market due to their high quality. A number of quality testing facilities, including SGS, ITS, TUV, SIGNET, HOHEINSTEIN, and others, have emerged recently. We refer to them as third parties. They take quality assurance very seriously. Therefore, in order to please clients and foster positive relationships with them, clothing firms must place a high priority on the quality of their products.

Quality is characterized by various factors. In actuality, it relies on the product and the needs of the buyer. However, one of the typical mines. A product's overall features and attributes, as determined by consumer expectations and product performance, can be referred to as its quality. Both quality and performance differ from person to person.

Every product has a unique quality that makes people want to buy it.

The chronicle of human civilization is replete with gems.

The following was defined by Aristotle 2500 years ago:

1. What distinguishes different products is quality.
2. It refers to a product's goodness or badness. This definition still holds true today. However, in general, a product's quality encompasses the key attributes that make it in demand. 'Conformity of the product to the customer's specifications' is another term for quality. Quality is defined by ISO 9000:2000 as the 'degree' to which a collection of underlying qualities satisfies the standards.

Two factors determine quality:

- 1. Form:** It depicts the features of the product in terms of dimensions, design, and size.
- 2. Content:** It stands for the qualities that convey the inherent quality, which is the caliber of the basic material plus any added value. Qualities types:

Based on perfection, there are three categories into which the degree of satisfaction can be separated:

1. Quality of general acceptability.
2. Level of contentment.
3. Category of high enjoyment quality.

2.5. QUALITY CHECK POINTS FOR THE MAKING OF GARMENTS:

When a consumer or end user purchases a garment, they start by considering the quality. Consequently, retailers must only stock high-quality items in their stores in order to satisfy customers. The buyer has the right to hold the supplier accountable if they provide them with defective items, as stated in the purchase contract. The factory may lose a lot of money and goodwill as a result. As a result, the producers monitor the clothing's quality throughout the whole production process. Before receiving the final product, the buyer typically inspects the shipment at the facility. The flaws discovered during the last inspection represent the culmination of earlier procedures. Therefore, it is crucial to fix any flaws while the work is still being done rather than waiting to finish.

The process of making a garment involves a large number of workers and machinery. A small percentage of substandard clothing may be produced in a batch as a result of malfunctioning

machinery or human error. It is possible to fix faulty parts by either replacing or repairing them. But time and money are needed for repairs. These two things make the business less efficient. In addition, if a fault passes through the first stage of the process without being found and fixed and the process proceeds, the subsequent repair costs will be significantly higher than if the defect had been found earlier.

After the fabric is received, the production process starts, and it concludes when the garment is wrapped and dispatched. To make sure that only high-quality items move on to the next step, the export house often maintains quality checkpoints at the conclusion of each phase. Below are the quality check points broken down by category.

Fabric Store	- 100% fabric inspection
Trim & accessories	- Trims inspection
Cutting Room	- Marker verification - Cut parts inspection or audit - Inspection of the bundle
Sewing Department	- Inline checkpoint (during crucial operation) - Roaming checking, also known as random checking - End of Line verification (100%) - Audit of the components that were checked
Finishing Department	- Initial assessment of the finished product (after washing) - Last completing examination (after pressing) Internal auditing of shipments

1.Fabric Store:

Checking at the fabric store before heading to the cutting section. Not every cloth is checked, usually. 10% of fabrics are typically examined to find reliable fabric suppliers. 100% of the printed and power loom fabric was inspected. Flat tables, light boxes with flat tables, or fabric checking machines are used for fabric checking. The incoming fabric quality is gauged using a 4-point approach for fabric inspection.

2.Trims and Accessories:

A high-grade clothing also greatly depends on the quality of the trimmings. Trims are examined at random in comparison to predetermined criteria, including color matching. However, it is crucial to verify the quantity of accessories and trimmings.

3.Cutting Room: Cutting is regarded as the core of production. Errors in subsequent stages are less likely if the cutting is done correctly. The checkpoints in the cutting room are:

- i) Marker checking,
- ii) Inspection of cut sections
- iii) Bundle checking.

4. Sewing Department: Checkpoints of sewing department are as follows:

***Inline inspection:** On assembly lines, check pints are often reserved for crucial processes. Partially stitched clothing is 100% checked at these checkpoints, and items free of defects move on to the next stage. High-end clothing is subjected to this kind of inspection.

★Roaming Inspection: In this case the checkers roam around the line and check pieces randomly at each operation.

★**Traffic light inspection system:** Very few makers of clothing make use of this checking procedure. Each operator in this system receives a card that tracks their quality performance. The quality checker visits the operator and randomly inspects a few pieces. Based on the findings of the inspection, the quality checker marks a red or green checker on the card using the rating criteria.

★**Table checking:** A checker checks the fully stitched garment at the end of the line. Here 100% checking is done.

★**Audit of checked pieces:** Although very few manufacturers adhere to this audit process, it is an essential hurdle to guarantee that only 100% examined clothing is transported from the sewing department for finishing. Additionally, any flawed parts are fixed before being sent to be finished.

5. finishing department: The final section consists of check points:

★**Primary finishing inspection:** The checking done before the garments are pressed in the finishing room is called primary finishing.

★**Final Finish Inspection:** Garments are checked again after pressing and passed for tagging and packing.

★ **Internal final audit:** After the garments are packed in specified quantities, quality control team, audit the packed garments. This process is done to confirm before the buyer hands over the shipment to QC.

2.5.1. INSPECTION BY 4 POINT SYSTEM:

Defect Length	Points
0" up to 3"	1
3" above to 6"	2
6" above to 9"	3
9" above	4
Fabric damage	4
Hole big knot	4

Equations for 4-point system inspection-

- a) Points per 100sq. yards: $(\text{Total points scored} \times 100 \times 36) / (\text{Width of the role (Inches)} \times \text{Total yards Inspected})$
- b) Points per 100s. meter: $(\text{Total points scored} \times 100 \times 100) / (\text{Width of the role (cm)} \times \text{Total yards Inspected})$.

A fabric's total defect points are determined for every 100 square yards, and the accepted threshold is often 40 penalty points. More than 40 dots on a fabric roll make it 'second'.

The 4-point system is popular. We now provide a quick overview of the 4-point inspection process.

Formula = $(\text{Total points} \times 3600) / (\text{Fabric width in inches} \times \text{Total yards of fabric examined})$.

2.6. DIFFERENT QUALITY CONTROL ARE MAINTAIN DURING INSPECTION:

.Cutting Quality Control: There are two layers of insurance for quality in the cutting area.

A) Diffusion Quality Control: The following criteria are used to check diffusion time:

★ **Table marking.**

★ **The end**

★ **tension**

★ **Leaning**

★ **narrow products**

★ **Calculation**

★ **Ply height**

★ **remains**

★ **Fabric defects**

★ **Market establishment**

2. Quality control after cutting: After each cutting the blocks and bundles are checked at the following points.

- a) Miss cut
- b). Rugged cutting
- c). Check the pattern
- d) Matching plies

3. In process quality control (sewing): Seven pieces of inspection equipment are used for line QC to accomplish "in process quality control" during the swing. Complete process inspection for vital functions. During the stitching process, the following parameters are additionally verified:

- a) Machine check.
- b) Excitement.
- c) SPI check
- d) Needle check.
- e) Cleanliness.
- f) Table inspection.
- g) Inspection before washing.

4. Quality control of finishing Department:

Following inspection/audit is done to achieve AQL (1.5/2.5/4.0etc).

a) Process Inspection: Garments are checked as per the process at the finishing section to detect defects and only passed garments are passed.

b) Two hourly Audit: AQL is done on completion lot every two hourly to achieve required AQ.

c) Final audit of the day: At the end of the day the accumulated bulk of finished garments is statistically audited to achieve the required AQL.

d) Lot Final Audit: When an entire garment has been packed, the QAL Manager performs a statistical audit using the necessary AQL garments. Only after completing this audit do buyers or clients give garments for final examination before shipping. They are additionally examined for the following factors throughout the stitching process:

Garments defects:

Any irregularity in the clothing that conceals its consumer acceptability qualifies as a garment defect. AQL systems are frequently used for the analysis of garment flaws.

2.7. AQL (ACCEPTABLE QUALITY LEVEL):

One of the terms used to describe quality the most frequently in the export clothing business is AQL. Given that AQL-based sampling plans are the primary basis for most acceptance decisions about clothing exports to export markets. Acceptable Quality Level is referred to as AQL. Before the manufacturer receives the completed product from the customer, like with any business procedure, inspect the product. In the export of clothing industry, it is crucial. thus product quality is a bigger issue for overseas consumers. They provide the manufacturer with the product's AQL. Customers examine the merchandise at random. He issues the product shipment certificate if the AQL test results indicate that the products are of an acceptable quality level. The AQL levels differ with products, processes, and even buyers to buyer.

Acceptance Quality Level (AQL) refers to the maximum number of defective items that can be considered accepted during random sampling and inspection. Defects found during inspection are classified into 3 categories:

1. Critical: Must be 100% accurate. There is no range.

2. Major: Normally 2.5%.

3. Minor: Normally 4%.

Sampling Method:

1. Single Sampling method.

2. Double Sampling method.

★AQL Requirements Based on the Products:

Generally speaking, the customer will choose the AQL and sample strategy to adopt. Single, double, and multiple sample plans are the three different categories of sampling plans. Depending on the needs for inspection and the caliber of the final product, each sampling plan can be carried out at three different levels: normal, tightening, and reduction. Single sample programs are the primary method used by the apparel industry to determine acceptance. But some purchasers also employ the technique of double sampling. When using single sampling, which is based on the AQL table, you select a sample at random from a large number of clothes. The maximum number of defective parts that are permitted is also provided in the sample plan. If there are fewer defective pieces than the permitted amount, the lot is approved; if there are more defective pieces than the permitted amount, the lot is rejected. Acceptance sampling can be considered scientific if, in theory, the results are 100% dependable. Stated differently, it should result in the acceptance of lots where the level of defect is less than the acceptable quality limit (AQL) and in the rejection of all lots where the amount of defective product exceeds the AQL. However, this is not feasible because the decision to accept is based solely on a small sample that was picked from the lot, which increases the possibility that the decision will be made incorrectly.

★Single sampling plan - Normal inspection:

Guarantees AQL of 2.5% and lot size of 1200 garments and sample size 80 garments. If the number of defective clothing available is 5, then the total lot "acceptable" is to say if the faulty clothing is 6, then the total lot is "reject / re-check".

★Double sampling plan - Normal Inspection:

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

2.7.1.AQL CHART:

Footwear Industry Standard Final Inspection Sampling Plan (Normal)*								
Lot Size or Quantity Audited	Acceptable Quality Level (AQL) Level							
	1.5		2.5		4		6.5	
	Inspect	Accept	Inspect	Accept	Inspect	Accept	Inspect	Accept
Less than 150	20	1	20	1	20	2	20	3
151 – 280	32	1	32	2	32	3	32	5
281 – 500	50	2	50	3	50	5	50	7
501 – 1,200	80	3	80	5	80	7	80	10
1,201 – 3,200	125	5	125	7	125	10	125	14
3,201 – 10,000	200	7	200	10	200	14	200	21
10,001 – 35,000	315	10	315	14	315	21	315	21
35,001 – 150,000	500	14	500	21	500	21	500	21
150,001 – 500,000	800	21	800	21	800	21	800	21
500,001&Over	1250	21	1250	21	1250	21	1250	21

Critical Defect:

Because of a significant flaw, the product is hazardous. Anything that practically breaks the law is seen as a major infraction. Any inconsistency that directly makes reference to the "toxic charter" or the "child safety regulations" would therefore be seen as a grave mistake.

Critical Defect:

- A. Noncompliance with legal requirements - The inspection certificate must have copies of all necessary test reports attached.
- b. The buyer's disregard for the specifications on metal detection.
- c. An incomplete, inaccurate, or inconsistent fiber composition.
- d. Wearing poppers, studs, or trim around children is not safe.
- b. Overly long thread ends or floats (greater than 1 cm) on products intended for children's wear.
- f. Parts with sharp edges.
- f. It is not possible to reach the minimum neck stretch.

Major Defect:

A significant flaw is one that buyers find out about during or after the purchase. This may result in fewer sales, client returns, and harm to the buyer's reputation. A severe defect is any flaw that results from the garment's size or placement.

Major defects:

- A. The label has an incorrect or mixed stitch.
- b. An incorrect swing ticket or jumbled bar code.
- c. Rough edges.
- d. needle damage.
- e. The variation in shade between a dress and a two-piece set
- f. Inaccurate measurement.
- g. Good product; certain ingredients are missing.

Minor Defect:

A minor flaw is one that has no bearing on the product's use or selling. Small mistakes are very hard to find.

faults are further divided into big complex faults and minor defects based on the severity of the default.

faults classified as critical defects are the most significant faults that cannot be corrected.

★ Major faults are grave flaws that, at the request of the buyer, are prohibited in a specific percentage (3%) of cases.

★ Minor faults are major flaws that, in accordance with buyer requirements, are not permitted in a specific percentage (5%) of cases.

Minor defect:

- A. light shade variation.
- b. Untidy seams.
- c. Slight smudge of print.
- d. fabric defects.
- e. End untrimmed thread.
- f. The wording on the packaging is unclear.

2.8. SOME COMMON FAULTS OF WOVEN FABRIC:

1. Slub
2. Broken yarn
3. Knot
4. End out
5. Screen out
6. Shade bar
7. Missing yarn
8. Foreign yarn
9. Broken pick
10. Burl mark
11. Coarse end
12. Double end
13. Double pick
14. Hole
15. Jerk in
16. Loom bar
17. Miss pick
18. Reed mark
19. Reed streak
20. Stop mark
21. Thick & Thin place
22. Tight end
23. Scrimp
24. pucker
25. Runner
26. Puckered selvedge
27. Mottled
28. Crease mark

The causes of faults in woven fabric are given below:

Slub:

 A short abnormal thick place in a yarn.

Broken yarn:

 Yarn broken in a woven fabric.

Knot:

 Two or more ends of yarn tied together.

End out:

 A missing warp yarn.

Screen Out:

 The appearance of a colored separation line in a printed design.

Shade bar:

 A change in shade within a short duration across the width of the fabric.

Missing yarn:

 yarn miss from woven fabric during making.

Foreign yarn:

 Another type of yarn mixed with woven fabric.

Broken pick:

 Yarn broken in a weft direction in woven fabric.

Burl mark:

 A slub or knot being removed with a burling tool in a fabric.

Coarse end/pick:

 A yarn having a large diameter than normal to the fabric.

Double end:

 Two ends wrongly weaved as one.

Double pick:

 Two picks wrongly placed in a single shed.

Hole:

 Any broken yarns to form a hole.

Jerk in:

 An additional weft yarn and the proper weft yarn pick were both yanked into the fabric by the shuttle.

Loom Bar:

 A change in shade across the full width of a fabric.

Miss pick:

 Missing a weft yarn.

Reed mark:

- ✚ A defect resulting from a bent reed wire, characterized by a fine-lined thin place in the warp directions.

Reed streak:

- ✚ A warp-wise streak caused by a damaged reed in weaving.

Stop mark:

- ✚ In consistent of yarn tension while a loom is stopped.

Thick place:

- ✚ Where the place of weft yarn greater in diameter than normal to the fabric.

Thin place:

- ✚ Where the place of weft yarn is smaller in diameter than normal to the fabric.

Tight end:

- ✚ A warp yarn in an abnormal restriction than the adjacent normal yarns.

Broken Color Pattern:

- ✚ Usually caused by colored yarn out of place on frame.

Color Out:

- ✚ The result of color running low in reservoir on printing machine.

Color Smear:

- ✚ The result of color being smeared during printing.

Crease Mark:

- ✚ differs from crease streak in that the streak is likely to last the full roll. Where fabric folds during finishing generate creases, a crease mark is visible. Final pressing might not be able to return napped cloth to its natural state. Discoloration is frequently an issue.

Mottled:

- ✚ Color applied unevenly during printing.

Puckered Selvage:

- ✚ Usually caused by selvage being stretched in finishing or by uneven wetting out in process.

Runner:

- ✚ Caused by broken needle. The runner will appear as vertical line. Most machines have a stopping device to stop the machine when a needle breaks.

Pucker:

- ✚ Results from uneven wetting out on usually caused by defective spray heads. Fabric will appear wavy or puckering when spread on cutting table. Difficult to detect while inspecting on inspection machine with fabric under roller tension.

Scrimp:

- ✚ The result of fabric being folded or creased when passing through frames.

CHAPTER-03

EXPERIMENTAL DATA

3.1 Methodology of the Study

3.1.1 Sources of Data

Two sources are consulted in the course of this research:

1. Original Source

2. Adjacent Source

1. **Primary Sources:** Information from **AB Apparels Ltd** quality control records, final inspection reports, and in-person meetings with key persons involved in the production and quality assurance procedures are examples of primary data collection methods.

2. **Secondary Sources:** To acquire background knowledge on typical errors made during the production of clothing and quality control procedures, secondary data sources like industry reports, scholarly publications, and relevant literature are assessed.

3.1.2 Information Evaluation

A. Qualitative Analysis: To understand their nature and forecast future issues, defects found during the garment final inspection are categorized and subjected to qualitative analysis.

flaws and pinpoint the fundamental reasons.

B. Quantitative Analysis: To calculate the financial impact of errors and ascertain their frequency over time, quantitative methods like statistical analysis can be applied.

3.1.3 Information Gathering

We gathered 10 final inspection reports for data gathering over the course of the industry's working days.

3.2 Acquiring Data Secondary Information Obtained from a Supposed Denim Manufacturing Facility:

Supplier/ Factory: AB Apparels Ltd.		Final Inspection Report		Date: 24/Feb/24																																																													
User Type: Menswear	☒ PASS ☐ FAIL ☐ PENDING	TOD:	Section: Finishing	Unit:	Line:																																																												
Merchandiser: Shyamal Ghosh	Tech: Md. Akhtarul Habib	Pack Qty: 4,761 Pcs	Final Inspection Result.																																																														
Buyer: PRIMARK	Ord Qty: 4,761 Pcs	Ctn Qty: 361 CTN	Critical Major Minor																																																														
Style: DENIM BERMUDA	Cut Qty: 4,761 Pcs	Ctn Pick Qty: 20 CTN	Acceptable	0	10																																																												
Order no: 1135844 (K-83471)	Sewing Qty: 4,761 Pcs	Visual Check Qty: 200 Pcs	Defect Found	0	8																																																												
Style Des: Mens Denim Shorts	Finishing Qty: 4,761 Pcs	Measurement Qty: 32 Pcs	Accommodation		7																																																												
Color: Light Grey	Country: Czech Republic, Germany		Measurement:																																																														
PO: C12105830(NE2-BOR), G12105831(NE1-MGB)			Sample Pick	2	LBL																																																												
Styling Check: OK	PS: ok	WS: ok	Visual Check:	2.5	AQL																																																												
**Check Moisture: Acceptable Range: 60		Found Moisture: 30-50	Measurement	4	AQL																																																												
Notes Of Over Moisture :-																																																																	
Lot or Batch Size	Sample keeping L-1 L-2 L-3	Sample Qty	1.5 AC / REJ	2.5 AC / REJ	4.0 AC / REJ																																																												
2 - 8	2 2 3	2	0/1	0/1	0/1																																																												
9 - 15	2 3 5	3	0/1	0/1	0/1																																																												
16 - 25	3 5 8	5	0/1	0/1	0/1																																																												
26 - 50	5 8 13	8	0/1	0/1	1/2																																																												
51 - 90	5 13 20	13	0/1	1/2	1/2																																																												
91 - 150	8 20 32	20	0/1	1/2	2/3																																																												
151 - 200	13 32 50	32	0/1	2/3	3/4																																																												
201 - 500	20 50 80	50	1/2	3/4	5/6																																																												
501 - 1200	32 80 125	80	2/3	5/6	7/8																																																												
1201 - 3200	50 125 200	125	3/4	7/8	10/11																																																												
3201 - 10000	80 200 315	200	5/6	10/11	14/15																																																												
10001 - 35000	125 315 500	315	8/9	14/15	21/22																																																												
35001 - 150000	200 500 800	500	12/13	21/22	23/22																																																												
<table border="1"> <thead> <tr> <th>Cutting</th> <th>Sewing</th> <th>Finishing</th> <th>Packing</th> <th>Safety & Critical Check</th> </tr> </thead> <tbody> <tr> <td>Woven</td> <td>Thread/Scam</td> <td>Washing</td> <td>Folding Approv</td> <td>Needle Control</td> </tr> <tr> <td>Pattern</td> <td>Stitch / S.P.I.</td> <td>Shade</td> <td>Multi Pack</td> <td>Sharp Tools Control</td> </tr> <tr> <td>Marker</td> <td>Elastic/ Velcrow</td> <td>Thread Cut</td> <td>Solid pack</td> <td>Lockstitch Button</td> </tr> <tr> <td>Seize Match</td> <td>Bm holes/ Key holes</td> <td>Cleaning</td> <td>Hanger</td> <td>Pull Testing</td> </tr> <tr> <td>Cutting Reports</td> <td>EMB/Printing</td> <td>Button/ Rivet</td> <td>Price Ticketing</td> <td>Needle Detector Passing</td> </tr> <tr> <td>Shading</td> <td>Pocketing/ Eyelet</td> <td>Pressing</td> <td>Hangtags/ etc</td> <td>Nickel Testing</td> </tr> <tr> <td>Ply Matching</td> <td>Label & Position</td> <td>Measurement</td> <td>Polybag</td> <td>Garments Testing</td> </tr> <tr> <td>Cutting Accuracy</td> <td>Bottom/ Hiem.</td> <td>Shade Check</td> <td>Carton</td> <td>Fire Warning Label</td> </tr> <tr> <td>Colour</td> <td>Bartacking</td> <td>Sku Checking</td> <td>Poly/ Barc/ Stkr</td> <td>Zipper Check</td> </tr> <tr> <td>Fabric Hand Feel</td> <td>Lining/ Drawcord</td> <td>Others</td> <td>Shipping Mark</td> <td>Others</td> </tr> <tr> <td>Others</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>						Cutting	Sewing	Finishing	Packing	Safety & Critical Check	Woven	Thread/Scam	Washing	Folding Approv	Needle Control	Pattern	Stitch / S.P.I.	Shade	Multi Pack	Sharp Tools Control	Marker	Elastic/ Velcrow	Thread Cut	Solid pack	Lockstitch Button	Seize Match	Bm holes/ Key holes	Cleaning	Hanger	Pull Testing	Cutting Reports	EMB/Printing	Button/ Rivet	Price Ticketing	Needle Detector Passing	Shading	Pocketing/ Eyelet	Pressing	Hangtags/ etc	Nickel Testing	Ply Matching	Label & Position	Measurement	Polybag	Garments Testing	Cutting Accuracy	Bottom/ Hiem.	Shade Check	Carton	Fire Warning Label	Colour	Bartacking	Sku Checking	Poly/ Barc/ Stkr	Zipper Check	Fabric Hand Feel	Lining/ Drawcord	Others	Shipping Mark	Others	Others				
Cutting	Sewing	Finishing	Packing	Safety & Critical Check																																																													
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Fabric Hand Feel	Lining/ Drawcord	Others	Shipping Mark	Others																																																													
Others																																																																	
Workmanship findings & Defects																																																																	
S/N					Critical faults	Major faults	Minor faults																																																										
1	Pull yarn at front and back				0	2	0																																																										
2	Washing spot at front and back				0	3	0																																																										
3	Raw edge out at inside waist				0	1	0																																																										
4	Skip stitch at inseam				0	1	0																																																										
5	Open seam at back pocket bag				0	1	0																																																										
6	Poor repairing at waist				0	0	1																																																										
7	Untrimmed threads at inside and top part				0	0	5																																																										
8	Dirty spot at inside				0	0	1																																																										
Note 1 # Found mixed shade in the same carton 3 ctn out of 20 ctn- 15% (Color-Light Grey)																																																																	
Purchase Order- 1135844, / (Kimball- 83471).																																																																	
CTN WEIGHT FOUND OK.																																																																	
					Total Defects:	0	8																																																										
							7																																																										

Comments:

Goods Are Passed As Per AQL 2.5



Khairul/Habib
Prepared By

PM

QM

AGM / GM (Q.A)

3.2.1 Inspection Report 2:

HOHENSTEIN ●

Preliminary Inspection Report

Order No	442253_2307	Date	29/03/2024
Client	OWIM GmbH & CO.KG	Service Item	100% PSI 1 of 1
HI order no.	24.0.09597	Inspector	Masud & A. Rahman
Order Qty	43,974 Pcs	Lot size	43,912 Pcs
Sample size	500 Pcs	In %	100
A. General			
Supplier	Baycity		
Manufacturer	AB Apparels Ltd.		
Contract person	Mr. Kawser		
Address	225, Singar Road, Hemayetpur, Savar, 1340 Dhaka, Bangladesh.		
Telephone/ fax	+8801912651179	N/A	
Inspection location	AB Apparels Ltd., 225, Singar Road, Hemayetpur, Savar, 1340 Dhaka, Bangladesh.		
Accompanied by	Mr. Hakim & Mr. Masud		
B. Product information			
Product description	H Jeansshorts CO 2fach sort.		
Product item/style	A & B		
Product destination	CB- 1, 4 (CZ,HU), 7 (GR) & 8.		
C. Inspection result			
	Pass	Fail	Not applicable
Product type		✓	
Workmanship	✓		
Measure conformity	✓		
Weight conformity		✓	
EAN-code	✓		
Packing/ labeling of product		✓	
Assortment	✓		
Overall result	Pass.		
	✓ Fail.		
	Subject to client.		
Additional Note:			
- Product type is fail because difference shell fabric shade between approved sample from production garments, style/color- B, rating-3/4 (we have found 25 pcs out of 311 pcs). - We have found defects in workmanship Major 16 Pcs & Minor 19 Pcs. Major defects are- Broken stitch= 06 pcs, Damage fabric= 01 pcs, Skipped stitch=01 pcs, Rawedge visible=01 pcs, Pulled thread=01 pcs, Washing defect=03 pcs, Dirt mark=02 pcs, Pleat at seam=01 pcs. Minor defects are- Untrimmed thread ends=11 pcs, Pleat at seam=04 pcs, Poor joint stitch=03 pcs, Washing defect=01 pcs. - Packing/labeling of product is fail because style/color: All, Lining - (pocketing fabric): 80% polyester, 20% cotton is missing on sales packing & care label. - Packing labeling of product is fail because the sales packaging are out of tolerance.			



Manufacturer signature/Date
Handwritten Report signed by ManufacturerTime_____

Inspector signature/Date
Handwritten Report completed Time_____

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3.2.2 Inspection Report 3:

HOHENSTEIN

Preliminary Inspection Report

Order No.	461014_2310	Date	06 April, 2024.
Client	OWIM GmbH & Co. KG	Service Item	100% PSI 01 of 01
HI order no.	24.0.15529	Inspector	Atik and Moni Sankor
Order Qty	42,792 Pcs	Lot size	42,708 Pcs
Sample size	500 Pcs	In %	100
A. General			
Supplier	Daytex		
Manufacturer	FRM Fashion House Ltd.		
Contract person	Mr. Muazzam		
Address	226, Singair Road, Hemayetpur, Savar, Bangladesh.		
Telephone/ fax	+8801722-594364	N/A	
Inspection location	FRM Fashion House Ltd, 226, Singair Road, Hemayetpur, Savar, Bangladesh.		
Accompanied by	Mr. Nurul Haque and Mr. Masud		
B. Product Information			
Product description	D Jeansshorts High Waist Cargo CO Lidl VA 2fach sort.		
Product item/style	A. B.		
Product destination	Block: 02, 04-SI, 05-OSES & 08.		
C. Inspection result			
	Pass	Fail	Not applicable
Product type		✓	
Workmanship	✓		
Measure conformity	✓		
Weight conformity		✓	
EAN-code	✓		
Packing/ labeling of product		✓	
Assortment	✓		
Overall result	☐ Pass.		
	☒ Fail.		
	☐ Subject to client.		
Additional Note:			
- For style A, different color shading of shell fabric between production and approved sample, rating-3/4 (52 out of 289 pieces). - We have found defect in workmanship checked major 17 pcs and minor 18 pcs out of 21/21. Major: Broken stitch-08 pcs, Open seam-02 pcs, Fabrics damage-01 pcs, Skipped stitch-06 pcs. Minor: Untrimmed thread ends-08 pcs, Poor joint stitch-01 pcs, Pleat at seam-01 pcs, Puckering-03 pcs, Run-off stitch-01 pcs, Raw edge visible-01 pcs, Gathering stitch-01 pcs, Wash defect-02 pcs. - Weight conformity fail because weight is over from maximum allowed style-A & B. - CB-2/Style-A+B/Size-44, the sales packaging dimensions were checked with a tolerance of 1 cm. Instead of 40x30x3 we found 2.5x30x39, which has to be rated as a critical defect according to clients' requirements. - For Style-A, B. As per test order lining fabric composition missing, 80% polyester 20% cotton at waistband rider and care label.			



Manufacturer signature/Date
Handwritten Report signed by Manufacturer Time _____

Moni
06.04
2024

Inspector signature/Date
Handwritten Report completed Time _____

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3.2.3 Inspection Report 4:

HOHENSTEIN

Preliminary Inspection Report

Order No	442253_2307	Date	29/03/2024
Client	OWIM GmbH & CO.KG	Service Item	100% PSI 1 of 1
HI order no.	24.0.09597	Inspector	Masud & A. Rahman
Order Qty	43,974 Pcs	Lot size	43,912 Pcs
Sample size	500 Pcs	In %	100
A. General			
Supplier	Baycity		
Manufacturer	AB Apparels Ltd.		
Contract person	Mr. Kawser		
Address	225, Singar Road, Hemayetpur, Savar, 1340 Dhaka, Bangladesh.		
Telephone/ fax	+8801912651179 N/A		
Inspection location	AB Apparels Ltd., 225, Singar Road, Hemayetpur, Savar, 1340 Dhaka, Bangladesh.		
Accompanied by	Mr. Hakim & Mr. Masud		
B. Product information			
Product description	H Jeansshorts CO 2fach sort.		
Product item/style	A & B		
Product destination	CB- 1, 4 (CZ,HU), 7 (GR) & 8.		
C. Inspection result			
	Pass	Fail	Not applicable
Product type		√	
Workmanship	√		
Measure conformity	√		
Weight conformity		√	
EAN-code	√		
Packing/ labeling of product		√	
Assortment	√		
Overall result	Pass.		
	√ Fail.		
	Subject to client.		
Additional Note:			
1. Product type is fail because difference shell fabric shade between approved sample from production garments, style/color- B, rating-3/4 (we have found 25 pcs out of 311 pcs). 2. We have found defects in workmanship Major 16 Pcs & Minor 19 Pcs. Major defects are- Broken stitch= 06 pcs, Damage fabric= 01 pcs, Skipped stitch=01 pcs, Rawedge visible=01 pcs, Pulled thread=01 pcs, Washing defect=03 pcs, Dirt mark=02 pcs, Pleat at seam=01 pcs. Minor defects are- Untrimmed thread ends=11 pcs, Pleat at seam=04 pcs, Poor joint stitch=03 pcs, Washing defect=01 pcs. 3. Packing/labeling of product is fail because style/color: All, Lining - (pocketing fabric): 80% polyester, 20% cotton is missing on sales packing & care label. 4. Packing labeling of product is fail because the sales packaging are out of tolerance.			



Manufacturer signature/Date
Handwritten Report signed by Manufacturer Time _____

[Handwritten signature]
29.03.24

Inspector signature/Date
Handwritten Report completed Time _____

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3.2.4 Inspection Report 5:

HOHENSTEIN

Preliminary Inspection Report

Order No	444040_2307	Date	17/03/2024
Client	OWIM GmbH & CO.KG	Service Item	100%PSI 1 of 3
HI order no.	23.0.00003	Inspector	Moni Sankar & A. Rahman
Order Qty	64,956 Pcs	Lot size	27,492 Pcs
Sample size	315 Pcs	In %	100
A. General			
Supplier	Baycity		
Manufacturer	AB Apparels Ltd.		
Contract person	Mr. Kawser		
Address	225, Singar Road, Hemayetpur, Savar, 1340 Dhaka, Bangladesh.		
Telephone/ fax	+8801912651179	N/A	
Inspection location	AB Apparels Ltd., 225, Singar Road, Hemayetpur, Savar, 1340 Dhaka, Bangladesh.		
Accompanied by	Mr. Hakim & Mr. Masud		
B. Product information			
Product description	KK/K J Bermuda Web LI/CO Best 2fach sort.		
Product item/style	A & B		
Product destination	CB- 2, 7 (HR, RS).		
C. Inspection result			
	Pass	Fail	Not applicable
Product type		✓	
Workmanship	✓		
Measure conformity	✓		
Weight conformity		✓	
EAN-code	✓		
Packing/ labeling of product		✓	
Assortment	✓		
Overall result	Pass.		
	✓ Fail.		
	Subject to client.		
Additional Note:			
1. Product type is fail because difference shell fabric shade between approved sample from production garments, style/color- B, rating-3/4 (we have found 36 pcs out of 210 pcs). 2. We have found defects in workmanship Major 13 Pcs & Minor 20 Pcs. Major defects are- Broken stitch= 03 pcs, Damage fabric= 06 pcs, Skipped stitch=02 pcs, Flying yarn=01 pcs, Open seam=01 pcs. Minor defects are- Untrimmed thread ends=05 pcs, Dirt mark= 01 pcs, Pleat at seam=04 pcs, Puckering=02 pcs, Flying yarn=05 pcs, Loose stitch=01 pcs, Poor joint stitch=02 pcs. 3. Weight conformity is fail because the weight is over than the maximum tolerance allowed. Style/color: A. 4. Packing labeling of product is fail because the sales packaging & carton dimensions are out of tolerance.			



Manufacturer signature/Date
Handwritten Report signed by Manufacturer Time _____

Inspector signature/Date
Handwritten Report completed Time _____

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3.2.5 Inspection Report 6:

HOHENSTEIN		Preliminary Inspection Report	
Order No.	449166_2307	Date	28 February, 2024.
Client	OWIM GmbH & Co. KG	Service Item	100% PSI 02 of 03
HI order no.	23.0.98419	Inspector	Atik and Tanvir
Order Qty	90,860 Pcs	Lot size	25,438 Pcs
Sample size	315 pcs	In %	100
A. General			
Supplier	Baycity		
Manufacturer	AB Apparels Ltd.		
Contract person	Mr. Pintu and Mr. Rony		
Address	226, Singair Road, Hemayetpur, Savar, Bangladesh.		
Telephone/ fax	+8801301-597064	N/A	
Inspection location	AB Apparels Ltd, 226, Singair Road, Hemayetpur, Savar, Bangladesh.		
Accompanied by	Mr. Hakim and Mr. Masud		
B. Product information			
Product description	H Jeansshorts 2fach sort.		
Product item/style	A. B.		
Product destination	Block: 01-CH, 04-HU, 07-RO, BG, RS.		
C. Inspection result			
	Pass	Fail	Not applicable
Product type		✓	
Workmanship	✓		
Measure conformity	✓		
Weight conformity		✓	
EAN-code	✓		
Packing/ labeling of product		✓	
Assortment	✓		
Overall result	☐ Pass		
	☒ Fail.		
	☐ Subject to client.		
Additional Note:			
- For style A, different colour shading of shell fabric between production and 100% sealed sample, rating-3/4 (22 out of 180 pieces). - We have found defect in workmanship checked major 11 pcs and minor 17 pcs out of 14/21. Major: Skipped stitch-03 pcs, Broken stitch-04 pcs, Fabrics damage-01 pcs, Open seam-01 pcs, Raw edge-01 pcs, Missing yarn-01 pcs. Minor: Untrimmed thread ends-08 pcs, Flying fiber-01 pcs, Poor iron-02 pcs, Wash defect-05 pcs, Dirt mark-01 pcs. - Weight conformity fail because weight are over from maximum allowed style-A (shell and lining) - Packing Labeling of product failed because as per test order 80% Polyester 20% cotton missing on waistband rider and care label.			

Manufacturer signature/Date

Inspector signature/Date

Handwritten report signed by Manufacturer Time _____

Handwritten Report completed Time _____

Only the Official Inspection report with signature issued by Hohenstein Textile Testing GmbH & Co. KG is binding

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3.2.6 Inspection Report 7:

HOHENSTEIN ●

Preliminary Inspection Report

Order No.	453469_2307	Date	06 February 2024
Client	OWIM GmbH & Co. KG	Service Item	100% PSI 1 of 3
HI order no.	23.0.99263	Inspector	Moni Sonkhor & Mahiuddim
Order Qty	17,796 Pcs	Lot size	12,696 Pcs
Sample size	315 Pcs	In %	100
A. General			
Supplier	Baycity Textilhandels GmbH & Co. KG.		
Manufacturer	AB Apparels Ltd.		
Contract person	Mr. Pintu		
Address	225, Singair Road, Hemayetpur, Savar, Dhaka, Bangladesh.		
Telephone/ fax	(01301597064)	N/A	
Inspection location	AB Apparels Ltd. 225, Singair Road, Hemayetpur, Savar, Dhaka-1340, Bangladesh.		
Accompanied by	Mr. Hakim & Mr. Masud.		
B. Product information			
Product description	KK M Paperbagshorts Denim CO 3fach sort.		
Product item/style	A ,B & C		
Product destination	CB: 4 (SI), 7 (BG, HR) & 08		
C. Inspection result			
	Pass	Fail	Not applicable
Product type		✓	
Workmanship	✓		
Measure conformity	✓		
Weight conformity		✓	
EAN-code	✓		
Packing/ labeling of product		✓	
Assortment	✓		
Overall result	Pass		
	✓ Fail		
	Subject to Client		
Additional Note:			
01. Product type is failed because, difference shell fabric shade between Approved sample to production garments, style/color- A & C, rating ¾ (style/color-A, we found 14 pcs out of 106 pcs & style/color- B, we found 12 pcs out of 105 pcs).			
02. We have found defects in workmanship Major=13 pcs & Minor=16 pcs. Major defect are, Broken stitch=07 pcs, Skipped stitch=03 pcs, Damaged fabric=03 pcs & Minor defect are, Untrimmed thread ends=06 pcs, Dirt mark=06, Poor joint stitch=01 pcs, Washing defect=02 pcs, Fly yarn=01 pcs			
03. Weight conformity is fail because the weight is over than the maximum tolerance allowed, style/color- A & B			
04. Packing/ labeling of product is failed due to carton & sales packaging dimension are out of tolerance.			



Manufacturer signature/Date
Handwritten Report signed by Manufacturer Time _____

Inspector signature/Date
Handwritten Report completed
Time _____

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3.2.8 Inspection Report 8:

HOHENSTEIN ●

Preliminary Inspection Report

Order No.	453469_2307	Date	06 February 2024
Client	OWIM GmbH & Co. KG	Service Item	100% PSI 1 of 3
HI order no.	23.0.99263	Inspector	Moni Sonkhor & Mahiuddim
Order Qty	17,796 Pcs	Lot size	12,696 Pcs
Sample size	315 Pcs	In %	100
A. General			
Supplier	Baycity Textilhandels GmbH & Co. KG.		
Manufacturer	AB Apparels Ltd.		
Contract person	Mr. Pintu		
Address	225, Singair Road, Hemayetpur, Savar, Dhaka, Bangladesh.		
Telephone/ fax	(01301597064)	N/A	
Inspection location	AB Apparels Ltd. 225, Singair Road, Hemayetpur, Savar, Dhaka-1340, Bangladesh.		
Accompanied by	Mr. Hakim & Mr. Masud.		
B. Product information			
Product description	KK M Paperbagshorts Denim CO 3fach sort.		
Product item/style	A ,B & C		
Product destination	CB: 4 (SI), 7 (BG, HR) & 08		
C. Inspection result			
	Pass	Fail	Not applicable
Product type		✓	
Workmanship	✓		
Measure conformity	✓		
Weight conformity		✓	
EAN-code	✓		
Packing/ labeling of product		✓	
Assortment	✓		
Overall result	Pass		
	✓ Fail		
	Subject to Client		
Additional Note:			
01. Product type is failed because, difference shell fabric shade between Approved sample to production garments, style/color- A & C, rating % (style/color-A, we found 14 pcs out of 106 pcs & style/color- B, we found 12 pcs out of 105 pcs).			
02. We have found defects in workmanship Major=13 pcs & Minor=16 pcs. Major defect are, Broken stitch=07 pcs, Skipped stitch=03 pcs, Damaged fabric=03 pcs & Minor defect are, Untrimmed thread ends=06 pcs, Dirt mark=06, Poor joint stitch=01 pcs, Washing defect=02 pcs, Fly yarn=01 pcs			
03. Weight conformity is fail because the weight is over than the maximum tolerance allowed, style/color- A & B			
04. Packing/ labeling of product is failed due to carton & sales packaging dimension are out of tolerance.			

Manufacturer signature/Date
Handwritten Report signed by Manufacturer Time _____

Inspector signature/Date
Handwritten Report completed Time _____

Hohenstein Textile Testing Institute
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3.2.10 Inspection Report 10:

		SGS Bangladesh Limited Connectivity & Products- Inspection DRAFT REPORT ON INSPECTION		Format No.: INSPDOC/07 Issue: 01, Rev: 00 Effect. Date: 01.02.2022			
Report Date: 30-04-2024				SGS Report Ref. No.: GLNWT000			
To : Norma (Bay City Textilhandels GmbH)		E-mail : meuer.bc@fashioncenter.net					
Attn : Ms. Nicolin							
Cc : Global Apparel GmbH		E-mail : nuruzzaman@global-apparel.co					
Attn : Mr.Nuruzzaman							
From : SGS-Dhaka / Hashinur Rahman		E-mail: Hashinur.rahman@sgs.com					
SGS BOSS No.: 401102085		BOSS Creation Date: 29.04.2024		SGS Reg. No. Nil			
Buyer: Norma/Georg Roth Stiftung & Co. Lebensmittelbetrieb KG. Agent: N/A Supplier: Global Apparel GmbH/ Bay City Textilehandels GmbH Manufacturer: AB Apparel Ltd. Product Description: Men's Bermuda Shorts, Regular Fit. P.O no. 4275 (KFB No: 2024-1181632) L/C no. N/A Total Pages: ##					Product view		
Style/Item/Article	Order No.	Ordered Q'ty Pcs	Declared Q'ty Pcs	Unit packed in carton	Units Finished Not Packed	Colour	Carton
KFB No: 2024-1181632 (97291)	4275	13,616 Pcs	13,616 Pcs	13,616 Pcs	100 %	Black Beauty+ Black Iris + Ebony	1,702
Total:		13,616 Pcs	13,616 Pcs	13,616 Pcs	-	-	1,702
Inspection Type Performer: FRI					Inspection Date: 29-April- 2024		
Inspection Location: 226 Singair Road,Hemayetpur,Savar,Dhaka, Bangladesh.							
OVERALL INSPECTION CONCLUSION Not Conform for GSM Subject to client's evaluation for Measurement.							
INSPECTION CONCLUSION DETAILS (in comparison to principal's instructions and reference sample, as available)							
1.Inspection Quantities Submitted:		Conform					
2.Style, Material , Colour:		Not Conform (Please see 1.2 for GSM)					
3.Workmanship Appearance /Functioning		Conform					
4.Packing:		Conform					
5.Marking/ Label:		Conform					
6.Data Measurement /Field Tests:		Subject to client's Please see the attached Measurement sheet.					
Remarks:	01.	Inspection was carried out based on PO sheet, size spec, technical sheets, approved sample (PP received from client & after completing inspection this sample kept in factory premises.					
	02.	Factory did not have any dummy to wear garments.					
	03	We checked carton drop test and found ok.					
	04.	We scanned barcode & found OK according to barcode information sheet.					
	05.	12 pcs Major defect sealed by SGS printed gummed tape & handed over to supplier for send to your kind evaluation.					
	06.	We checked OEKO TEX certificate with Price tag and found ok valid till : 31-01-2025					

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3.2.11 Inspection Report 11:

HOHENSTEIN ●

Preliminary Inspection Report

Order No.	453469_2307	Date	06 February 2024
Client	OWIM GmbH & Co. KG	Service Item	100% PSI 1 of 3
HI order no.	23.0.99263	Inspector	Moni Sonkhor & Mahiuddim
Order Qty	17,796 Pcs	Lot size	12,696 Pcs
Sample size	315 Pcs	In %	100
A. General			
Supplier	Baycity Textilhandels GmbH & Co. KG.		
Manufacturer	AB Apparels Ltd.		
Contract person	Mr. Pintu		
Address	225, Singair Road, Hemayetpur, Savar, Dhaka, Bangladesh.		
Telephone/ fax	(01301597064)	N/A	
Inspection location	AB Apparels Ltd. 225, Singair Road, Hemayetpur, Savar, Dhaka-1340, Bangladesh.		
Accompanied by	Mr. Hakim & Mr. Masud.		
B. Product information			
Product description	KK M Paperbagshorts Denim CO 3fach sort.		
Product item/style	A, B & C		
Product destination	CB: 4 (SI), 7 (BG, HR) & O8		
C. Inspection result			
	Pass	Fail	Not applicable
Product type		✓	
Workmanship	✓		
Measure conformity	✓		
Weight conformity		✓	
EAN-code	✓		
Packing/ labeling of product		✓	
Assortment	✓		
Overall result	Pass		
	✓ Fail		
	Subject to Client		
Additional Note:			
01. Product type is failed because, difference shell fabric shade between Approved sample to production garments, style/color- A & C, rating % (style/color-A, we found 14 pcs out of 106 pcs & style/color- B, we found 12 pcs out of 105 pcs).			
02. We have found defects in workmanship Major=13 pcs & Minor=16 pcs. Major defect are, Broken stitch=07 pcs, Skipped stitch=03 pcs, Damaged fabric=03 pcs & Minor defect are, Untrimmed thread ends=06 pcs, Dirt mark=06, Poor joint stitch=01 pcs, Washing defect=02 pcs, Fly yarn=01 pcs			
03. Weight conformity is fail because the weight is over than the maximum tolerance allowed, style/color- A & B			
04. Packing/ labeling of product is failed due to carton & sales packaging dimension are out of tolerance.			

Manufacturer signature/Date
Handwritten Report signed by Manufacturer Time _____

Inspector signature/Date
Handwritten Report completed Time _____

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www.hohenstein.de

3.3 Summary of inspection report:

date	buver	Pieces	Broken stitch	puckering	Uneven at bottom hem	Uneven leg length	Uneven leg opening	Dirty spot	Un cut thread at waist	Hi-low at back pocket	Uneven at mouth closing	Roping at front pocket	Poor join stitch	Pleat at waist	Skip stitch	Missing yarn	Open seam	Looseness at back pocket	Wash mark	Fabric damage	Looseness at front/back slightly	Uncut thread at inside /front	Untrimmed thread at seam/back	Shade variation both part	Poor shape	Washing spot	Uneven wash effect	other	total
14 . 08 . . 22	B I G W	3 1 5	1	2	2		2			1					1	1		2	2		1		1			3		2	21
30 05 21	B I G W	2 0 0	2		1			2			3	1	1		1		1	1		3			2		1			1	19
27 12 21	B I G W	2 0 0	3	1				2		1				2		1		1		1		1	2		1			0	19
21 04 22	B I G W	3 1 5	3		1	1		1	2				1	1	1		1	2	2			3		1	2		2	2	26
16 03 22	B I G W	2 0 0	1		1			1	1	1	2	1	2		1				4		2		1		2		1	3	17
22 05 22	B I G W	3 1 5	4	1		1	1		1		1			2		2	2		6	1			1			1	1	2	26
22 05 22	B I G W	2 0 0	3	1			1		1			2			1	1		1		1	2		2		1			1	17

17 05 22	B I G W	2 0 0	2		1			2		1	1	1		1	2		1	2		1				2	0	16	
28 02 22	B I G W	1 2 5	2	1		1			1		1		1	2			2			1			1		4	17	
24 04 22	B I G W	2 0 0		1		3	1		1	2	1					1		1	1				2	3	16		
26 05 22	B I G W	2 0 0	1		1	5		1	1			1		1	1			2		1		1	2		1	19	
17 05 22	B I G W	2 0 0	1	1			1		1	1			1	1	1		2			1	1			2	4	17	
08 01 22	B I G W	8 0	1		1			1			2				1	2			1		2	3		1	4	19	
05 05 21	B I G W	5 0 0	1	1					3			1		2	1			2		1	1					5	17
21 06 22	B I G W	2 0 0	2				2				2					1	8			1		2		1	4	20	
02 06 21	B I G W	3 1 5	1		1		2		3			2			3	2		3		1		1		1		4	25
08 01 22	B I G W	1 2 5		1					2	1			2			1			1						03	11	

Total	3890 Pieces																									
		28 (8.69%)																								
		08 (2.48%)																								
		09 (2.79%)																								
		09 (2.79%)																								
		10 (3.10%)																								
		09 (2.79%)																								
		18 (5.59%)																								
		10 (3.10%)																								
		11 (3.41%)																								
		09 (2.79%)																								
		08 (2.48%)																								
		09 (2.79%)																								
		12 (3.72%)																								
		10 (3.10%)																								
		08 (2.48%)																								
		13 (4.03%)																								
		30 (9.31%)																								
		08 (2.48%)																								
		10 (3.10%)																								
		11 (3.41%)																								
		09 (2.79%)																								
		07 (2.17%)																								
		08 (2.48%)																								
		12 (3.72%)																								
		04 (1.24%)																								
		42 (13.04%)																								
		322																								

CHAPTER-04

RESULT & DISCUSSION

4.1 Results:

Buyer name : BIG W

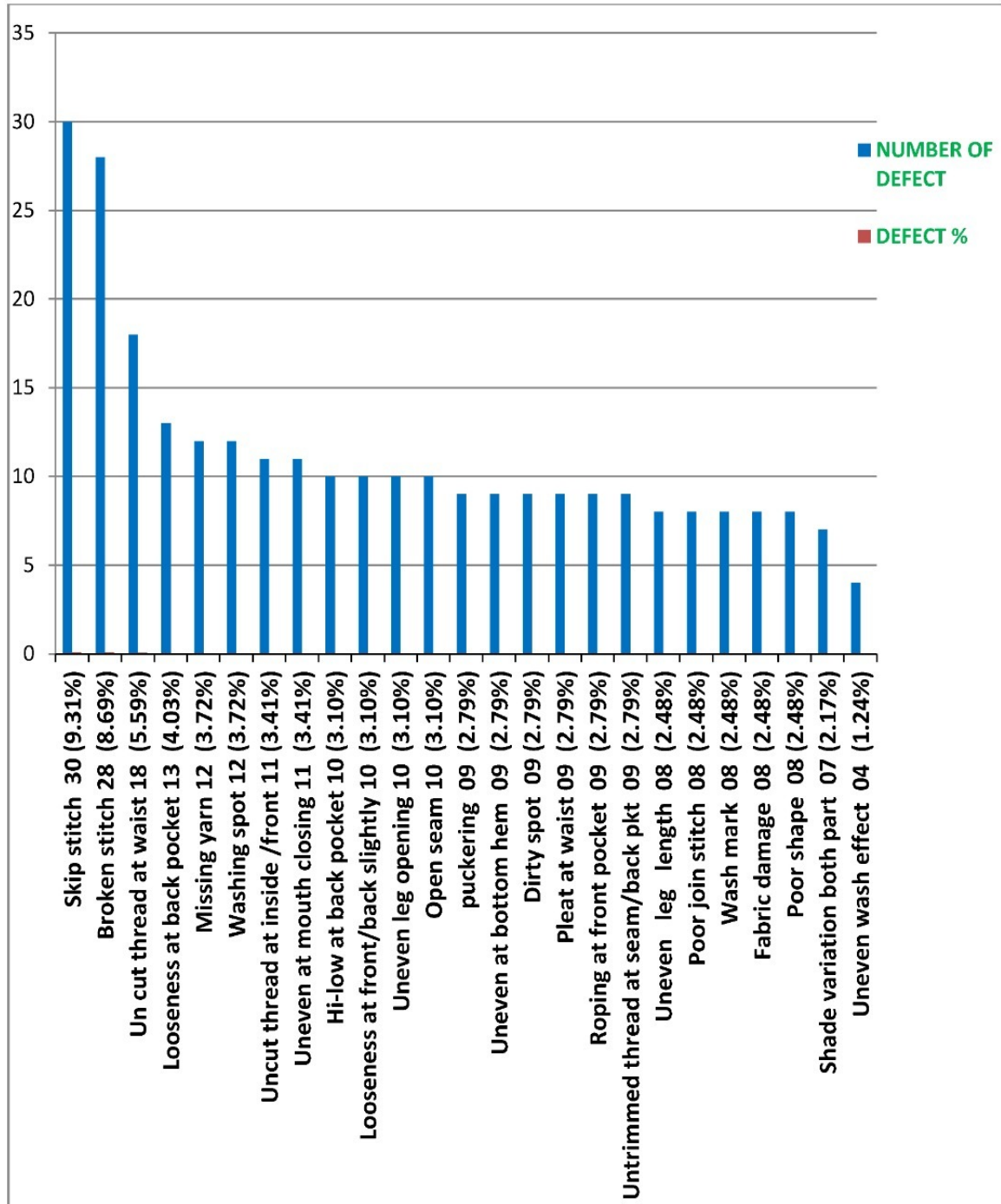
Third party inspection agent name : HOHENSTEIN

Total inspection sample : 2850pieces

Defect Description :-

 Skip stitch	: 30 (9.31%)
 Broken stitch	: 28 (8.69%)
 Un cut thread at waist	: 18 (5.59%)
 Looseness at back pocket	: 13 (4.03%)
 Missing yarn	: 12 (3.72%)
 Washing spot	: 12 (3.72%)
 Uncut thread at inside /front	: 11(3.41%)
 Uneven at mouth closing	: 11 (3.41%)
 Hi-low at back pocket	: 10 (3.10%)
 Uneven leg opening	: 10 (3.10%)

 Open seam	: 10 (3.10%)
 puckering	: 09 (2.79%)
 Uneven at bottom hem	: 09 (2.79%)
 Roping at front pocket	: 09 (2.79%)
 Untrimmed thread at seam/back pkt	: 09 (2.79%)
 Uneven leg length	: 08 (2.48%)
 Poor join stitch	: 08 (2.48%)
 Wash mark	: 08 (2.48%)
 Fabric damage	: 08 (2.48%)
 Shade variation both part	: 07 (2.17%)
 Uneven wash effect	: 04 (1.24%)
Other defect	: 42 (13.04%)
Total defect	: 322



4.2. DISCUSSION OF DEFECTS FROM FINAL INSPECTION REPORT AND THEIR REMEDIES:

We can observe that the majority of the flaws are in the stitching area of the inspection report mentioned above. Our quality will increase and the percentage of garments rejected at final inspection will decrease if we can get rid of such flaws.

1. **Skip stitches (9.31%):** where the needle loop is missed by the needle looper or the stitch producing mechanism. Skips typically appear just before or right after considerable thickness and are typically observed where one seam crosses another seam.



Causes:

- The hook, looper, or needle not entering the loop at the proper moment.
- As a result of needle deflection.
- Caused by uneven thread tension on the upper or lower loop.

Remedies:

- Check the distance and time between the hook or looper and the needle.
- The thread's tension has to be changed.
- It is time to change the needle.

2. **Broken stitch (8.69%):** Re-stitching must be done on top of the broken stitches in cases when the stitch line threads break during stone cleaning, sandblasting, hand sanding, etc.



Causes:

- If not skilled operator
- threads are broken during stone washing, sand blasting, hand sanding etc.

Remedies:

- For operations where there is a lot of friction, use threads with a bigger diameter.
- Be careful you use a high-quality sewing machine that is free of UT.
- Needs to collaborate with knowledgeable operators.

3. Washing spot (3.72%): Creating a spot in washing is called a washing spot defect.



Causes:

Laundry stains are typically the result of too many chemicals in the washing machine. The operator of the washing machine may make these mistakes. Furthermore, washing stains result from a weak component of the washing machine breaking and falling into the washing system. The following are a few more common reasons why wash stains occur: High pH levels, prolonged washing, overheating, etc., might all be the cause.

Remedies:

Prior beginning the washing system, it is crucial to choose the ideal quantity (%) of the necessary chemicals. It is important to check whether the right amount of chemicals are being utilized throughout the washing process before beginning. The operator can begin the washing process if the chemical concentration is at its ideal level; if not, denim clothing will show up as a washing spot. In order to lessen the washing spot, operators should keep an eye on every component of the washing machine and replace any potentially weak parts first. It could be able to reduce washing spots by managing the aforementioned sources.

4. pleat (2.79%) : When the fabric is creased during sewing and stitched in that position, it is called a pleat.



Causes:

- If the amount of elastic in the fabric is high.
- If not skilled operator.
- If the fabric does not swing properly and move forward.

Remedies:

- Such highly elastic fabric requires skilled operators.
- To arrange the fabric so that it can easily move forward after swinging.

5. Open seam (3.10%) : This is what happens when the cross stitch on denim jeans pants is not stitched correctly.



Causes:

- If not swing well at the cross point.
- If not done carefully.
- If an inefficient swing operator.

Remedies:

- Use a high-quality sewing machine and proceed with extreme caution when sewing.
- This issue arises when the stitch tension is not at the proper level when sewing two pieces of an article of clothing together. must cooperate with a highly effective offensive.

6. missing yarn (3.72%) : When the warp or weft yarn is absent from the loom or is torn as a result of the friction of the reed during the fabric-making process, the cloth has this fault.



Causes:

- In the event that the warp yarn is overlooked when being fed through the loom machine's reed.
- Tearing may result from the warp yarn's friction with the reed.
- When the tension is pulled, the warp yarn will tear if its strength is poor.
- This issue arises on the cloth if the waft's yarn skips the pick.

Remedies:

1. It is important to make sure that the loom machine does not overlook any warp or weft yarn.
2. Warp yarn needs to be correctly sized in order to maximize its strength.
3. care must be given to ensure that the waft yarn pick in the loom is not missed.

4.3. ANALYSIS OF SOME REJECTED GARMENTS.

Denim Jeans:

Location	Inspect for	Remedies
1.size	Size label is in correct place, and every parts size is correct or not	Proper labeling & bundling
2.Button & button hole	positioned properly or not, the evenness of the space between buttons, the accuracy of the stitching, and whether any buttons are damaged or not.	Accurate marking (measurement) and expert stitching
3.Pocket	Does the pocket's upper edge lie flat or horizontally? How big is the pocket? How well-matched are the stitch, stripe, and check	Proper marking for placement & skilled stitch
4. Hem	Stitch: is the edge free from the stitch, is there any puckering that occurs.	Proper tension & skill during stitch
5.. Side seam	Pattern matching, stitch, free from raw edge	Utilize expert craftsmanship to prevent excessive force or tension.
6. Finished Appearance	The appearance of the thread edge, the presence of oil stains, fabric flaws, color and strip matching.	Can be avoided during inspection.

4.3.1. CONTROL OF GARMENT REJECTION RATE IN GARMENT MANUFACTURING:

It won't be shocking in the clothing manufacturing industry to discover some returned clothing after shipping. Because the majority of manufacturers consider clothing to be a soft product with repairable faults that could arise from subpar raw materials, flawed manufacturing procedures, or careless staff behavior. But in order to manage this issue, the manufacturer needs checkpoints.

There isn't a prefabricated solution that can instantly lower the rejection rate. Every order is distinct. However, we can offer suggestions for handling this issue and lowering the rejection rate. We describe how to determine an order's rejection percentage.

It is equal to Total rejected garments *100/ Total cut quantity.

4.3.2. SOME INSTRUCTION TO REDUCE REJECTION RATE:

1. Gather every rejected piece. The total meaning is the amount that was shipped less the total amount that was cut from the pieces that were not shipped.

2. Call your garment checkers who can understand what is wrong and find out why the garments were rejected.

3. Ask them to list every item of clothing that was returned or that had a flaw. problems can be analyzed in two ways: first, through a quality system wherein garments are checked and reports are made during the checking process; second, through the final checker who detects problems in the rejected pieces (those that did not make the report). Rejected clothes.

4. From your diagnosis, choose the highest occurring errors (top 5 errors) and practice finding the root causes of generation of those errors. Bring your quality staff, production and technical staff to this exercise.

5. The next step is to eliminate the underlying reasons of each error and figure out how to avoid making the same mistakes again after you have determined what caused it. Since you work in this industry and are aware of mistakes that can happen, I don't think you will have too much trouble with this task. Seek assistance from peers or specialists if you are unable to address the underlying problems.

6. You discovered a few fixes. Fantastic! Create standard operating procedures to ensure that similar mistakes are not made in the future. Put it into practice. Check the outcomes with your subsequent shipment.

7. It is a means of lowering the rejection percentage rate and increasing the cut to ship ratio. Corrective action, in my opinion, is the only way to prevent more mistakes.

4.3.3. BEST PRACTICES TO CONTROL DEFECT GENERATION IN GARMENTS INDUSTRY:

Clean workplace - from cloth shop to cutting to sewing to washing and finishing.

1. Install quality control mechanisms. Not enough, that is. Checker, skilled checker, creates reports during the checking process, evaluates reports, and acts upon the findings of quality check reports.
2. Provide checkers with training programs that cover proper piece inspection in order to identify defective pieces and teach them how to create garment checking reports.
3. Run quality awareness programs for your employees.
4. Quality standards must be understood by every employee and everyone must work to meet quality goals.
5. No inferior work should be accepted by the following departments.
6. It will help you track the missing pieces. In my experience, operators tend to throw pieces under the table when they make a mistake or receive a defective (incomplete) garment from a previous operator. No one keeps track of these missing pieces until you find the garment lacking in completion. The sewing line does not allow operators to leave bundles open, and each bundle must be completed before being forwarded to the next.
7. Set standard operating procedures (SOP) for each task performed by your staff. SOP for quality control system for each department.
8. Set audit team to audit your quality system at regular intervals.
9. Implement 5S in your factory.

5.CONCLUSION

We achieved the goal of identifying common faults and their hidden causes through the analysis of final inspection reports taken from the denim industry, named AB Apparel Limited. Denim's casual charm is what makes it so attractive, but poor manufacturing, dyeing, or finishing can ruin a brand's reputation and dissatisfy consumers. Following analysis, from four separate sections, we were able to identify a total of 322 faults. We can now explain the reasons behind these faults. At this point, we have some understanding of how to minimize the chances that these mistakes are going to happen. Based on the findings from our study, we discover that the Other defect & Skip stitch has the highest percentage of faults. (13.04%), and (9.31%) . From our project work, we can say that all the processing steps, from fabric receiving and cutting to finishing, are responsible for different kinds of fabric defects. The following are the percentages of each: Broken stitch (8.69%), Un cut thread at waist (5.59%), Looseness at back pocket (4.03%), Missing yarn (3.72%), Washing spot (3.72%), Uncut thread at inside /front (3.41%), Uneven at mouth closing (3.41%), Hi-low at back pocket (3.10%), Uneven leg opening (3.10%), Open seam (3.10%), puckering (2.79%), Uneven at bottom hem (2.79%), Roping at front pocket (2.79%), Untrimmed thread at seam/back pkt (2.79%), Uneven leg length (2.48%), Poor join stitch (2.48%), Wash mark (2.48%), Fabric damage (2.48%), Shade variation both part (2.17%), Uneven wash effect (1.24%).To make sure all the parts are operating properly, all industrial machinery must go through regular checkups. More appropriate instruction and training needs to be required for all industry workers.

In conclusion, we can say that this project will be highly beneficial to our careers.

REFERENCE:

- **Industrial survey :**

AB Apparels Ltd.

- **Books and Web Survey:**

1. Garment Manufacturing Technology... .. Md. Saiful Azam, Md. Abu Saleh–

[2] <https://www.onlineclothingstudy.com/2019/04/148-garment-defects-found-in-readymade.html>

[3] <https://www.fibre2fashion.com/industry-article/3092/defects-in-garments>

[4] <https://medium.com/@testcoo/how-to-prevent-garment-defects-in-apparel-and-textile-industry-9e012e8f73c>

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