

Studies on the Defects of Legiens: A Study in Asrotex Group of Industries

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**Studies on the Defects of Legiens: A Study in
Asrotex Group of Industries (Sensible Fashion
Ltd.).**

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This report submitted in partial perfection of the requirements for the degree of
Master of Science in Textile Engineering
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DECLARATION

I hereby declare that, this project has been done by us under the supervision of **Tanvir Ahmed Chowdhury**, Assistant Professor, Department of Textile Engineering, Faculty of Engineering, and Daffodil International University. I also declare that, neither this project nor any part of this project has been submitted elsewhere for award of any other degree



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LETTER OF APPROVAL

Title of the thesis **Studies on the Defects of Legiens: A Study in Asrotex Group of Industries (Sensible Fashion Ltd.)**

This thesis report prepared by **Taufik Jamil Buyan (ID: 211-32-433)** is approved in Partial Fulfillment of the Requirement for the Degree of **MASTER'S OF SCIENCE IN TEXTILE ENGINEERING**. The said student has completed his thesis work under my supervision. During the research period I found them sincere, hardworking and enthusiastic.



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ACKNOWLEDGEMENT

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DEDICATION

“This Thesis report is dedicated to my
beloved Parents & Teachers”

ABSTRACT

Garment failure has become a major problem in today's garment industry because it affects the actual productivity of the garment. In this post, we will talk about the different kinds of garment defects, which is a term that is widely used in the industry. In our study, we find that it is very important to know the different kinds of garment defects. In the industry, the kind of garment defect depends on the type of defect classification and the judgment made by the inspector. The main purpose of the study or thesis is to analyze the defects in legines in Asrotex group of industries (Sensible Fashion Ltd). In order to accomplish the main purpose, we need to analyze minor, major and critical defects both in workmanship and in packaging of legines. In the second level inspection, a few samples of the order quantity are taken and inspected to determine the defect. After the detection of the defect, the finished legines is free from the questions of the buyer, and it is the last inspection before delivery.

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Chapter: 1

Introduction

1.1. Background of the study.

The success and reputation of fashion companies hinge significantly on the quality of their final products. Consumers rightly anticipate flawless apparel that matches their expectations in terms of appearance, texture, and durability. However, it's undeniable that errors can occur during clothing production, leading to subpar quality and dissatisfied customers. Such defects not only incur financial losses for manufacturers but also tarnish brand image and erode customer trust. Enhancing quality control procedures and enhancing customer satisfaction necessitate a comprehensive understanding of the nature, causes, and consequences of these defects within the fashion industry.

To achieve this, it's crucial for fashion businesses to thoroughly grasp the types and implications of faults in finished garments, which encompass a range of issues affecting their structure, form, and functionality. These issues can arise at various stages of manufacturing, including cutting, sewing, finishing, and packaging. Common errors encompass sewing mistakes, fabric imperfections, printing or embroidery mishaps, zipper or button malfunctions, irregular seams, discoloration, incorrect labeling, dimensional inaccuracies, and craftsmanship flaws. The root causes of these deficiencies are multifaceted and interconnected, stemming from inadequate quality control protocols, machinery malfunctions, human errors, insufficient training or supervision, substandard materials, and communication breakdowns within the supply chain, among others.

Identifying the underlying reasons for such failures is pivotal for implementing targeted corrective measures and preventing future recurrence. The ramifications of defects in finished garments transcend the production realm, leading to customer disappointment, discontent, and negative word-of-mouth publicity. In today's fiercely competitive market, where consumer feedback and social media presence wield considerable influence over brand perception, even a solitary garment flaw can profoundly impact a company's reputation and bottom line. Moreover, addressing customer complaints, processing defective returns, and issuing refunds impose additional strains on manufacturers and retailers, impinging on operational efficiency and profitability.

To mitigate errors and ensure the quality of finished garments, the fashion industry must institute robust quality control protocols, enhance collaboration and communication with suppliers, and implement training and skill development initiatives for personnel. Establishing robust feedback mechanisms for prevention and continual improvement is imperative. This study endeavors to meticulously analyze the defects in finished garments, delving into their categorization, root causes, and repercussions. Drawing on existing research, empirical evidence, and real-world case studies, this research aims to aid fashion brands in refining their quality control processes, minimizing errors, and offering recommendations. Ultimately, the objective is to empower the fashion industry to deliver flawlessly crafted garments that align with the discerning expectations of consumers.

1.2 Objectives:

Broad objective

To investigate the defects of Legines in Asrotex Group of Industries (Sensible Knit Dyeing Mills Ltd.)

Specific Objectives:

1. Analyze Legines for minor defects in both workmanship and packaging.
2. Analyze Legines for major defects in both workmanship and packaging.
3. Analyze Legines for Critical defects in both workmanship and packaging.

Chapter: 2

Literature Review

2.1. Garments Error Overview

A garment defect, encompassing any deviation or imperfection in the final garment that fails to meet the predetermined quality standards, is a common occurrence in the apparel industry. These defects can arise at various stages of garment production, spanning cutting, sewing, finishing, and packaging. To effectively address quality issues and uphold standards, it's imperative for the apparel sector to grasp the diverse manifestations of garment defects. These defects can manifest in myriad forms, impacting distinct facets of the end product. Here are some typical examples of clothing flaws:

2.2. Sewing Defect

Sewing mistakes are flaws or problems in finished clothing that are solely due to the sewing process used to make the garment. Sewing mistakes can be caused by a variety of factors, such as human error, faulty equipment, poor sewing technique, or inadequate quality control processes. The structural integrity, appearance, and overall quality of the finished garment can all be impacted by sewing mistakes. There are a few stitching flaws present.

2.2.1. Skip Stitch

Gaps or incomplete seams occur when sections of fabric are omitted during the sewing process, a phenomenon commonly referred to as "skipped stitches." Such stitching irregularities can arise from a range of factors, including machinery malfunctions, needle deficiencies, imbalanced thread tension, or characteristics inherent to the fabric itself. Let's delve deeper into the implications of fabric with skipped stitches:



Figure 2.1: Skip Stitch

Causes

Skipped stitches can be caused by:

- A needle that is dull or broken, causing difficulty in effectively piercing the fabric.
- Utilizing an incorrect type or size of needle for the fabric. Incompatible combination of needle and thread, such as using excessively thick thread or thread not suitable for the needle.
- Incorrect thread tension, characterized by uneven or improper tension, which can cause stitches to form irregularly or incorrectly, leading to skipped stitches. Fabric attributes,

like thickness or tight weaving, may hinder the sewing machine from consistently forming stitches, resulting in skipped stitches.

2.2.2. Loose Stitch

Loose stitches make clothing less stable and tight because the stitches are not tightened or fastened properly. Loose stitches can reduce the quality, durability and appearance of the finished garment.



Figure 2.2 : loose Stitch

Root Reasons of problem

- One of the main causes of loose stitches on a sewing machine is thread tension. If the thread tension is too low on the machine, the thread will not tighten enough. This can happen due to incorrect machine settings, incorrect tension dial adjustment, or worn out tension mechanism.
- Another cause of loose stitches is incorrect stitch length. If we use a longer stitch length than we need to, we may end up with loose stitches. Loose seams are caused by longer stitches because they provide less stability and coverage. The length of the stitch should be based on the fabric type, the structure of the seam, and the garment specifications. Stitch tightness can also be affected by the kind and quality of the utilized thread. Loose stitches can be caused by inferior quality threads with poor tensile strength or irregular thickness. To obtain secure and tight stitches, it's crucial to use the right type of thread and to guarantee high thread quality. [3,4]
- Sewing at a high speed without proper direction and control can lead to loose stitches. A faster machine can affect the tension and the formation of stitches, leading to loose stitches. It is important to maintain an accurate rate and have skilled workers control the machine to ensure.

2.2.3. Broken stitches

An incomplete or interrupted stitch line occurs when a stitch breaks, a sewing defect where the thread used in stitching fractures or snaps. This flaw can compromise the garment's strength, durability, and visual appeal. Broken stitches may stem from various factors, including:

- Thread type and quality significantly influence stitch integrity. Lower-quality or weaker threads may lack the necessary tensile strength to support stitching, resulting in frequent thread breakages. Hence, it's crucial to opt for premium threads appropriate for the fabric type and stitching technique.
- Incorrect sewing machine tension settings can lead to stitch breakage. Excessive tension puts undue pressure on the thread, causing it to break, while inadequate tension results in loose stitches that fail to hold firmly.
- Needle-related issues can contribute to stitch damage. Worn-out or damaged needles can cause thread fraying or breakage. Additionally, using an unsuitable needle size or type for the fabric can result in stitch breakage. Thus, selecting the correct needle type and size for the stitching application is paramount.
- Mechanical malfunctions in the sewing machine may cause stitch breakage. Problems like a misaligned needle, malfunctioning tension mechanism, or rough/damaged needle plate can lead to thread breakage during sewing. Regular machine maintenance and prompt repairs are essential to prevent such issues.
- Fabric handling plays a crucial role; rough handling during sewing can lead to frayed threads. Pulling, tugging, or pressing on the thread can cause stress and breakage. It's imperative to handle the fabric gently and ensure smooth, even machine feeding to mitigate this risk. [5,6]



Figure 2.3: Broken Stitch

2.2.4. Incorrect seam alignment

Incorrect seam alignment is a sewing flaw characterized by uneven or misaligned seams in a garment. This issue can adversely affect the garment's appearance, fit, and overall quality.

Wrong seam alignment may result from several factors, including:

- Design or cutting errors, such as misaligned pattern pieces or fabric layers.
- Misalignment of the presser foot or needle position during sewing.
- Misaligned components within the sewing machine.
- Improper machine calibration.
- Mechanical issues affecting the sewing process.

Incorrect seam alignment is caused by the following:

- ✓ Pattern piece misalignment
- ✓ Fabric layers misaligned or mislabeled
- ✓ Sewing machine components misaligned
- ✓ Seams sewn off-center^{7,8]}



Figure 2.4: Incorrect Seam Line

2.3. Fabric Defect

Fabric defects refer to any imperfections or irregularities present in the fabric used for clothing production. These defects can significantly affect the quality and performance of finished garments at different stages, including fabric production, processing, manipulation, or storage. Some common fabric defects include:

2.3.1. Holes

Holes in fabric are one of the common fabric defects that can significantly affect the quality and usability of the fabric.

Root causes:

- **Manufacturing defects:** Holes may form during the spinning, weaving, or knitting of yarn used for fabric production if these processes are not executed properly. Such defects can create weak points in the fabric's structure, increasing the likelihood of hole formation.
- **Damage during handling:** Holes can result from mishandling fabric rolls during transportation or storage. Additionally, contact with rough surfaces or sharp objects can cause punctures or tears in the fabric.
- **Habitat damage:** Fabric stored in environments where insects or pests like moths or beetles are present may be at risk of developing holes. These insects feed on fabric fibers, potentially leading to hole formation.
- **Wear and tear:** Fabric subjected to regular use or exposure to harsh conditions can weaken over time, becoming more susceptible to hole formation. This can occur when fabric fibers are rubbed, stretched, or come into contact with abrasive surfaces.
- **Chemicals or environmental factors:** Prolonged exposure to harsh chemicals, such as bleach or strong detergents, can weaken fabric fibers, making them more prone to developing holes. Similarly, exposure to environmental factors like sunlight or humidity can contribute to fabric degradation and hole formation...[9]



Figure 2.5: Holes

2.3.2. Snags

What are Snags in Fabric?

Snags are strands of thread or yarn that become displaced, resulting in an irregular and often unattractive appearance of the fabric. These imperfections can be attributed to various factors, including:

- **Friction:** Excessive rubbing or friction against rough surfaces can cause threads or yarns to become caught and pulled out of place, resulting in snags.
- **Exposure to abrasive materials:** Contact with abrasive materials such as rough surfaces or objects with sharp edges can lead to the snagging of fabric fibers.

- Varied handling conditions: Differences in how the fabric is handled or used over time can contribute to snag formation. For instance, improper storage or handling during transportation can increase the likelihood of snags developing..[10,11]

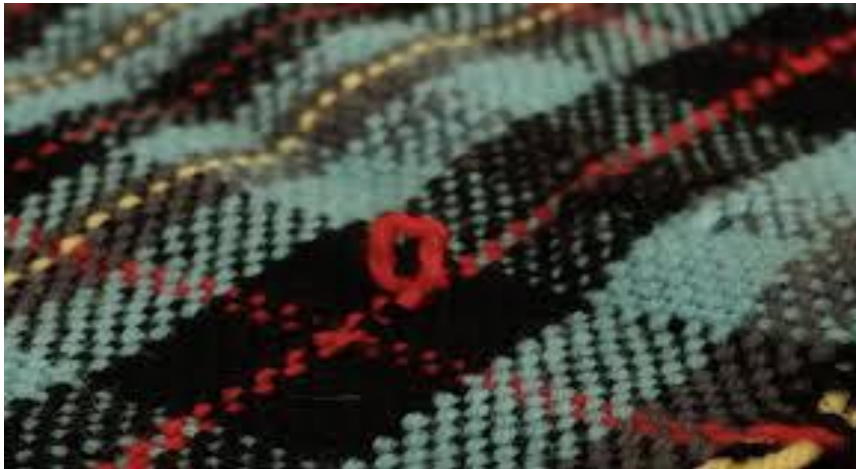


Figure 2.6: Snags

2.3.3. Stains

Fabric stains are discolorations or marks that mar the surface of the fabric, detracting from its appearance and quality. These stains can result from various factors, including

Stains can be caused by a variety of factors, including:

- Spills from liquids or substances (e.g., food, drinks, oil, ink, etc.) inadvertently spilled or coming into contact with fabric. Such spills can occur during the manufacturing process, handling, transportation, or regular use of the fabric.
- Improper handling of the fabric (e.g., touching the fabric with greasy or dirty hands, placing it on dirty or contaminated surfaces, or improper storage) can also result in stains.
- Chemical Processing: Various chemicals are utilized during fabric manufacturing for dyeing, printing, or finishing processes. Incorrect washing, inadequate removal of processing chemicals, or reactions between different chemicals may contribute to fabric stains.
- Environmental Factors: Exposure to sunlight, humidity, air pollutants, or other environmental elements can lead to discoloration. For instance, prolonged exposure to sunlight may cause certain fabrics to yellow or become discolored over time.



Figure 2.7: Stains

2.3.4. Pilling

Fabric deterioration manifests as the emergence of small, fuzzy, or fiber-like particles on the fabric surface. This common issue occurs when fabric threads loosen and intertwine, leading to pilling.

Reasons for the faults:

- **Fabric Quality:** Wrinkles are more likely to appear on garments made of short staple fibers that have loose or loose threads.
- **Friction:** Wrinkles can be caused by friction. Wrinkles are caused by regular wear and tear. Wrinkles can also be caused by rubbing against rough surfaces and abrasive materials.
- **Aggressive Washing and Drying:** Washing with abrasive brushes, using machines with rough internal surfaces or using fast spin cycles can create excessive friction on the fabric's surface and speed up adhesion.
- **Drying at high temperatures** can weaken fabric fibers and heighten the risk of pilling.
- **Garment Design and Construction:** Wrinkles are more likely to occur in garments featuring seams, collars, cuffs, or areas subjected to repeated stretching or friction.
- Wrinkles may also result from inadequate tension on garments or improper sewing techniques during manufacturing.
- **Fiber Properties:** Certain types of fibers are more prone to damage than others. For example, wool possesses natural scales that can interlock and contribute to pilling. Additionally, blends of different fiber types may result in differential wear, with one fiber pilling more than another. [13]

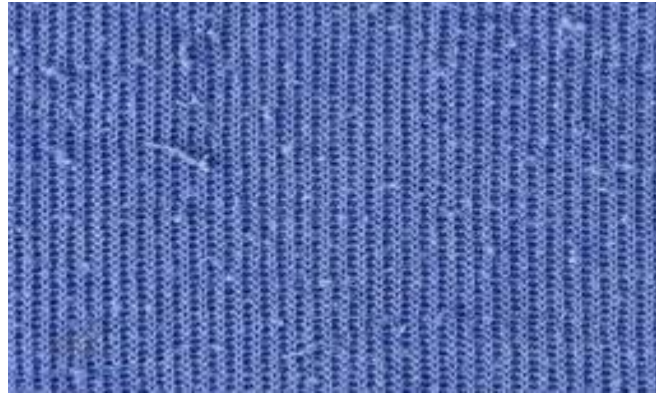


Figure 2.8: Pilling

2.3.5. Crease Mark

Crease marks on clothing are the visible lines or folds that form when fabric is folded or compressed in a particular manner and maintains this shape. Wrinkles can appear at different stages of clothing production, processing, storage, or usage. Here's some information about wrinkles in clothes:

Causes of wrinkles:

- **Folding and Packaging:** Wrinkles may develop during the folding and packing process, especially when the folding is done in a tight or pressure-sensitive manner. This can occur during production, transportation, or even retail.
- **Pressing and Ironing:** Creases can be caused by improper ironing techniques or excessive heat or pressure during pressing. Holding the iron in a specific area for an extended time or applying the iron unevenly can cause the fabric to develop wrinkles.
- **Storage:** Wrinkles and snags can develop in clothes that have been stored folded or hung on hangers for extended periods of time.
- **Sitting or Sleeping in a Wrinkles-prone garment** can occur when the wearer sits or sleeps in an area where the fabric has been pressed or folded. Wrinkles are more visible on fabrics with less bounce or elasticity. [14]



Figure 2.9: Crease Mark

2.3.6. Color bleeding

Color bleeding on clothing occurs when the color transfers from one fabric to another or from one area of the dyed fabric to another. This phenomenon typically arises due to inadequately set dyes or pigments in the fabric, or when the fabric is exposed to conditions that cause the colors to separate and transfer. Here's what you need to know about color bleeding in clothing:

Causes of colored bleeding:

- **Poor colorfastness:** The color may not set properly in the fabric if the fabric has not been dyed properly or if poor quality dyes are used. This can cause the color to bleed through the washing process, moisture, or contact with other fabric.
- **Inappropriate dyeing techniques:** If the dye is not washed or set properly, excess dye may remain on the fabric surface. [15] This excess dye residue can easily be transferred to other fabrics or other areas during the use or washing process.
- **Water temperature and pH levels:** Hot water or high pH can cause the dye to seep out of the fabric, resulting in color bleeding.
- **Contact with alkali substances:** Certain cleaning or detergent products can also cause color transfer.
- **Friction or mechanical action:** During washing or use, strong friction or mechanical action can cause color separation.
- **Abrasion:** The removal of loose dye particles can allow the dye to transfer to other areas of the garment.
- **Moisture and moisture:** Long-term exposure to moisture (excessive sweating or high humidity environment) can reactivate the dyes and cause bleeding.



Figure 2.10: Color Bleeding

2.3.7. Nep

Naps are tiny, densely entangled fibers resembling small twigs or messy clusters, typically shaped like a pinhead. These branches commonly comprise dead or immature fibers

Neps can be divided into three types:

1. Grandchildren are comprised of extraneous materials present in the raw material, such as seed coat, leaf, or stem fragments. Manufacturers typically eliminate these foreign substances through wet processing of the raw material.
2. White spots represent the prevalent type of grandchildren, appearing in wool during carding, in yarns, and on fabrics.
3. White spots consist of immature fibrous clusters that are not initially visible until they manifest as spots. They are primarily attributed to mechanical processing.

Causes and prevention of neps

1. Tie the threads together to form knots. Knots can be caused by the accumulation of flies and threads in the machine, poor fluff cleaning, poor carding, and incomplete knitting before processing.
2. Maintaining and cleaning the machine and scraper is the best way to prevent scratches and knots.
3. We can remove pins by combing prior to processing. It is important to detect pins early to avoid them in the finished fabric.



Figure 2.11: Nep

2.3.8. Barre

Barre refers to a recurring pattern observed along the course direction of a knitted fabric. It can stem from color discrepancies in the yarn or geometric irregularities during fabric manufacturing, resulting in the distinctive barre pattern. Additionally, variations in stitch length in knits may also contribute to barre formation. Improper blending of fibers can also be a cause of barre in some instances. For fabrics like polyester or cotton, barre may result from dyeing processes:

Reasons for Barre:

- Wrinkles can result from irregularities in knitting or weaving, such as uneven tension or disparate thread feed, leading to variations in fabric density. Moreover, uneven tension in warp or weft threads (lengthwise or widthwise) during fabric production can contribute to wrinkling and potential tearing.
- Inconsistent tension may arise from stretching or tightening one set of threads more than the other. Additionally, wrinkles may stem from irregular dyeing or printing processes, resulting in uneven color intensity and visible streaks or blotches on the fabric's surface.
- Yarn or fiber discrepancies may arise from differences in thickness, dye absorption, or fiber composition. These variations can cause the yarn or fiber to appear different on the fabric's surface.

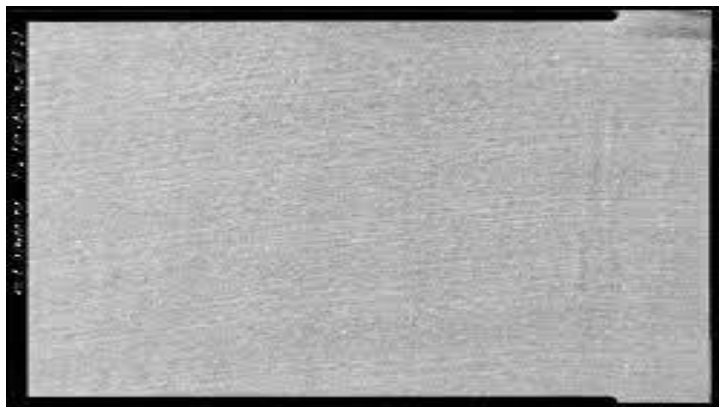


Figure 2.12: Barre

2.3.9. Coarse end

The rough end of a warp thread becoming visible on the fabric can be considered a fabric defect. It includes:

- ✓ Heavy head, also known as a "heavy head," denotes a warp thread head larger than the normal diameter, sometimes even double the size.
- ✓ Good end, also referred to as a "good end" or "good end," signifies a warp end smaller than the normal diameter.

When the warp thread's diameter is irregularly large or contains foreign matter, it can hinder the fabric from achieving a smooth and uniform appearance.

Causes and Prevention of Roughness of the Head:

Rough ends occur when two yarn spools, passing through the mill on the carding machine, encounter each other during the spinning process. This collision of yarn coils, termed duplication, eradicates differences in thickness. To prevent rough ends, it's crucial to inspect the hay before doubling to ensure there are no knots, bumps, or foreign objects. [19]



Figure 2.13: coarse end

2.4. Finishing Defect

The term "final defects" encompasses issues or imperfections that arise towards the conclusion of the manufacturing process, during which garments undergo various stages aimed at enhancing their appearance and quality. These defects can stem from human errors, machine malfunctions, or other contributing factors.

2.4.1. Trimming defect

Garment fit errors encompass issues or flaws with the embellishments utilized in the garment, such as buttons, zippers, ribbons, laces, tags, etc. These defects may arise during the manufacturing process and can impact the garment's overall quality and appearance. Here are some common fitting errors and their potential causes:

- ✓ **Missing Trims:** Occurs when the necessary embellishments are not attached to the garment.

Cause:

- Human error during sewing leads to skipping steps when attaching decorative details.
- Supply chain problems when toppings are not available or are not delivered on time.

- Deviated trims: Overlays are placed incorrectly or evenly spaced.

Cause:

- Inaccurate measurements or markings during the cutting and sewing stages.
- Lack of adequate training or attention to detail among workers..
- Loose or unsafe accessories: The pads are not securely attached to the garment, which can lead to the possibility of loosening during use.

Cause:

- Insufficient or incorrect sewing technique. Poor quality thread or adhesive is used to attach the trim.
- Inadequate quality control during production.
- Damaged details: Upholstery shows signs of wear, tear or breakage.

Cause:

- Rough handling during manufacturing, packaging or shipping.
- Use poor quality trim that cannot withstand the wear and tear over the life of the garment.
- Material and color deviation: Decorative details differing in color or material from specified requirements.

Cause:

- Supplier error or confusion when sourcing the topcoat.
- Lack of communication between design and production teams on finishing specifications.
- Frayed or unfinished edges: The hems are rough or frayed, affecting the appearance of the garment.

Cause:

- The finishing technique is not suitable during the production of the decoration. Improper handling when assembling clothes.



Figure 2.14: Trimming defect

2.4.2. Pressing Defect

Garment pressure damage refers to issues or defects that occur during the pressing or ironing process of a garment. Garment pressing is a crucial step in finishing garments as it helps create a crisp and smooth fabric surface, eliminates wrinkles, and enhances the overall appearance of the garment. However, various compression defects may arise during this process due to improper techniques, equipment malfunctions, or other factors. Some common mistakes that occur during garment pressing include:

- Shiny marks are reflective or glossy spots on the fabric surface resulting from excessive heat or pressure during the pressing process. These marks are particularly noticeable on heat-sensitive fabrics or smooth, shiny surfaces like silk and satin.
- Press marks are visible lines or marks left on a garment after pressing with irons or other equipment. They can occur due to over-pressing, improper pressure, or prolonged pressing of specific areas. These marks may be more prominent on delicate fabrics or garments with intricate patterns.
- Over-pressed areas are sections of a garment that have been pressed for too long or with excessive pressure, leading to flattening or curling of the fabric and resulting in an uneven appearance or loss of shape. Conversely, under-pressed areas are sections that have not received sufficient pressing, retaining creases and wrinkles that appear out of place on the garment.
- Print damage occurs when printing characters, designs, or patterns onto a garment is not executed properly, resulting in smudging, blurring, or distortion of the print or pattern, thereby compromising the intended design and aesthetic.

- Press damage refers to harm inflicted on the fabric or garment during pressing, often caused by burning, scorching, melting, excessive heat, or improper use of irons or pressing machines.
- Uneven pressing occurs when heat or pressure applied during pressing is unevenly distributed across the garment, resulting in areas of varying smoothness and giving the garment an uneven appearance.



Figure 2.15: Pressing defect

2.5. Printing Fault

Garment print damage refers to issues or errors that occur during the printing process, which involves applying patterns, designs, or graphics to fabric. While print jobs are crucial for enhancing the visual appeal of garments, various defects can arise. These defects may result from technical errors, equipment malfunctions, or other contributing factors. Common clothing mistakes related to print damage include:

2.5.1. Crease Mark

Wrinkles caused by printing can mar garments when the fabric hasn't been adequately prepared or treated during the printing process. These marks manifest as visible lines or creases on the fabric surface, detracting from the overall appearance of the printed design. Several factors can contribute to such wrinkles resulting from printing on clothing:

- Pre-treatment of fabric: Insufficient or improper pre-treatment of the fabric can result in wrinkles or folds that interfere with the printing process.
- Tension and relaxation: Inadequate tension or relaxation of the fabric during printing can lead to the formation of wrinkle marks.
- Drying/curing process: Proper drying or curing of the ink after printing is essential. Incomplete or insufficient drying/curing can cause uneven drying and result in wrinkle marks when the fabric is folded or handled.

- Handling: Improper handling of the printed fabric, such as folding or stacking before the ink has fully dried or cured, can lead to wrinkles.
- Ink absorption/interaction: Poor absorption or interaction of the ink with the fabric can result in creases or distortion.
- Uneven pressing/temperature distribution: Uneven printing equipment can cause wrinkles due to inconsistent pressure or heat distribution.
- Excessive pressing/friction: Excessive pressure or friction on the ink can cause it to shift or smear, leading to the formation of wrinkles.



Figure 2.16: Crease Mark

2.5.2. Color out

Printing color errors refer to cases where the printed colors of the garment do not correspond to the desired or expected colors. These errors can be caused by several reasons, including:

- Ink mixing and compounding errors can result in color changes if the ink is not properly mixed. Low-quality or outdated inks may also cause color inaccuracies. Poor-quality or outdated inks may lack the desired color strength and tone, leading to variations or inconsistencies in the printed design.
- Color profiles dictate how printing devices interpret and reproduce colors. Incorrect color profiles or settings can result in undesired color outputs.
- The type of substrate being printed on can influence the color outcome. Different fabrics absorb or reflect ink differently, leading to variations in color intensity or tone. Ensuring compatibility between the fabric and printing process is essential for accurate color reproduction.

- Environmental factors such as temperature, humidity, pressure, and speed can impact the printing process, affecting ink application, drying time, and resulting color.
- Design file issues, such as errors or inconsistencies, can cause color inaccuracies. Incorrect color profiles, missing or corrupted color data, or misconfigured design elements may lead to unexpected color outcomes during printing. [25]



Figure 2.17: Color Out

2.5.3. Misplaced Print

A misplaced print refers to an error where the print pattern or elements on the garment are not correctly aligned. This can occur when a printed picture or graphic deviates from its intended position, or when print elements are misaligned during the printing process. Here are some common causes of misplaced prints:

- In multi-color or multi-layered printing processes, registration is crucial for aligning each color or layer accurately to create a cohesive design. Incorrect alignment can lead to misprinting and flawed output.
- Printer failure, such as mechanical issues or malfunctions, can cause the printed pattern to shift or move during the printing process.
- Human error, whether from the user or the technician responsible for setting up and operating the printing equipment, can result in incorrect printing. This may include errors in artwork placement, garment positioning, or pattern alignment during printing.
- Fabric stretching or shrinking may occur during printing, particularly with certain fabrics that are prone to such changes. This can lead to inaccuracies in the printed pattern, especially if the fabric is heavily worn or sensitive to heat and moisture.



Figure 2.18: Misplace

2.5.4. Flushing

The term "absorption" or "washout" denotes a printing defect characterized by ink spilling or bleeding outside the intended areas of the print. This can result in a foggy or smeared appearance. Ink spillage or washout happens when ink seeps into the fabric fibers surrounding the print, altering the print area's size. Several factors contribute to absorption or washing errors:

- **Incorrect ink choice:** Using an ink unsuitable for the fabric type can result in absorption or washing issues. Some fabrics have high absorbency, causing ink to spread beyond the intended area. It's crucial to choose inks specially formulated to minimize absorption on the specific fabric being printed.
- **Inadequate curing:** If ink isn't properly cured or dried, it may lead to absorption or washing errors. Insufficient curing prevents proper adhesion of ink to the fabric, increasing the likelihood of spreading or bleeding during washing or heat treatment.
- **Over-inking:** Applying excessive ink to the fabric can heighten the risk of absorption or removal. Too much ink can readily soak into fibers and spread, diminishing print clarity.
- **Fabric absorption:** Certain fabrics, particularly highly absorbent ones like cotton or other natural fibers, can facilitate ink absorption or leaching. Such fabrics absorb ink more readily, making them susceptible to ink spreading beyond intended boundaries.



Figure 2.19: Flushing

2.5.5. Uneven Print

Uneven printing is a defect characterized by a garment's printed design appearing inconsistent in terms of color intensity, coverage, or texture. This may manifest as areas with patchy printing, uneven ink distribution, or irregular color saturation. Several factors can contribute to uneven printing:

- **Inconsistency in ink application:** Uneven pressure during ink application in the printing process can result in uneven printing. Areas of the printing surface may receive varying amounts of ink if it's applied unevenly.
- **Ink viscosity issues:** Ink that is too thin or too thick can distribute unevenly during printing, leading to variations in color intensity or coverage.
- **Ink screen alignment:** Misalignment of ink screens used in screen printing can cause design misregistration or shifting. This may result in parts of the design being printed in unintended positions or with differing ink coverage levels.
- **Substrate texture or absorption rate:** Fabrics with different textures or absorbency rates may interact with ink differently, causing uneven color or coverage.



Figure 2.20: Uneven Print

2.6. Embroidery defeat

Embroidery defects are issues that arise during the embroidery process, impacting the quality and appearance of the embroidered design on a garment. Here are some common embroidery defects:

2.6.1. Poor registration

Embroidery misalignment occurs when the embroidered pattern doesn't align correctly with the intended placement on the garment. This discrepancy can arise when various design elements, such as colors, shapes, or lines, are misaligned or improperly positioned. This can result in a visually unappealing and distorted embroidery pattern. Several factors can contribute to poor embroidery registration:

Poor registration can be caused by:

- Incorrect or poorly digitized design files.
- Inaccuracies in the design file creation or digitizing process.
- Issues with misalignment and stabilization.
- Incorrect hooping or inadequate fabric stabilization, leading to misalignment.
- Potential for pattern shifting or movement during the embroidery process.
- Machine calibration issues or misalignment of machine parts affecting alignment.
- Improperly calibrated machine settings, such as needle positions or hoop alignment.
- Uneven tension or incorrect thread tension during embroidery, resulting in poor alignment.
- Distortion of design elements due to differing needle placements caused by uneven thread tension.



Figure 2.21: Poor Registration

2.6.2. Fabric grin through

Fabric tears in embroidery refer to a phenomenon where the embroidered design becomes visible through the fabric's color or pattern. This occurs when the thread density or thickness of the embroidery is insufficient to fully cover the garment's base fabric. As a result, the color or texture of the fabric underneath the embroidery becomes visible, impacting the clarity and vibrancy of the design.

Fabric tears can be repaired in the following ways:

- Consider the fabric type and color when designing or selecting an embroidery pattern. Designs with higher stitch density or larger filler stitches can help minimize fabric tears, especially on light-colored or textured fabrics.
- Ensure proper placement of under stitches, which provide stability and coverage to the fabric before top stitches are applied. Well-set under stitches can reduce fabric distortion.
- Adjust stitch density and fill patterns to minimize fabric tears. By modifying stitch density and selecting appropriate fill patterns, you can increase coverage and reduce the visibility of the fabric underneath.
- Conduct testing and make adjustments as needed. Test the embroidery on fabric swatches to assess how it looks and if any fabric tears occur. If tears are still visible, adjust the pattern, stitch settings, or thread colors for improved coverage and reduced tearing.



Figure 2.22: Fabric Grin Through

2.6.3. Untrimmed embroidery

The term "uncut" refers to a type of embroidery where excess threads or fibers are left behind after the embroidery process is finished. This can result in the embroidered design appearing messy or unfinished, detracting from the overall look and quality of the design.

Here are some things to keep in mind when you are cutting your embroidery:

- Trim excess threads promptly after each embroidery design is completed, either manually by professionals or by using automatic thread trimmers.
- Provide users with cutting tools specifically designed for trimming threads to ensure clean and precise cuts. Dull or unsuitable tools can result in uneven or distracting cuts and visible thread residue.
- Train embroidery machine operators on proper cutting techniques to achieve clean and precise cuts consistently throughout the manufacturing process. Emphasize the importance of attention to detail.
- Conduct thorough inspections of embroidered garments to identify any uncut threads before delivery to customers. Inspections can be done visually or by running a hand over the garment to detect protruding threads.
- Implement quality control measures at various stages of production, including cutting, to ensure all excess threads are removed.
- Analyze and optimize your embroidery production workflow to minimize errors or oversights. Allocate sufficient time in the production schedule for thorough trimming.



Figure 2.23: Untrimmed embroidery

2.6.4. Bunching In Corner

An embroidered design with a bunch in the corner refers to an embroidery error where excess fabric or thread accumulates in the corner of the design, causing it to appear bulky or uneven. This issue can occur during embroidery and is attributed to various factors. Here are some considerations when dealing with corners.

- Ensure that the fabric is securely fastened during embroidery to prevent wrinkles in the corners. Use a tension ring to keep the fabric taut and prevent excess fabric from bunching up.
- Choose an appropriate backing material that provides stability and prevents excessive movement of the fabric, especially in the corners.
- Modify the design of the corners to prevent fabric curling. Adjust the stitch density or direction of the stitching to achieve smoother and more even stitching.
- Use under stitching to reduce angularity in corners. Under stitching provides stability and support to the top stitches, minimizing the likelihood of fabric creasing. Experiment with different under-stitching techniques to find the most suitable solution for your design and fabric.
- Ensure proper tension adjustment to prevent fabric from folding in the corner due to uneven thread tension. Calibrate the embroidery machine and adjust thread tension as needed to achieve smooth and even stitches.
- Practice proper operating techniques when using the embroidery machine to minimize fabric bending. Pay attention to the sewing process, ensure the fabric is properly secured with a tension ring, and adjust the fabric if wrinkles appear...

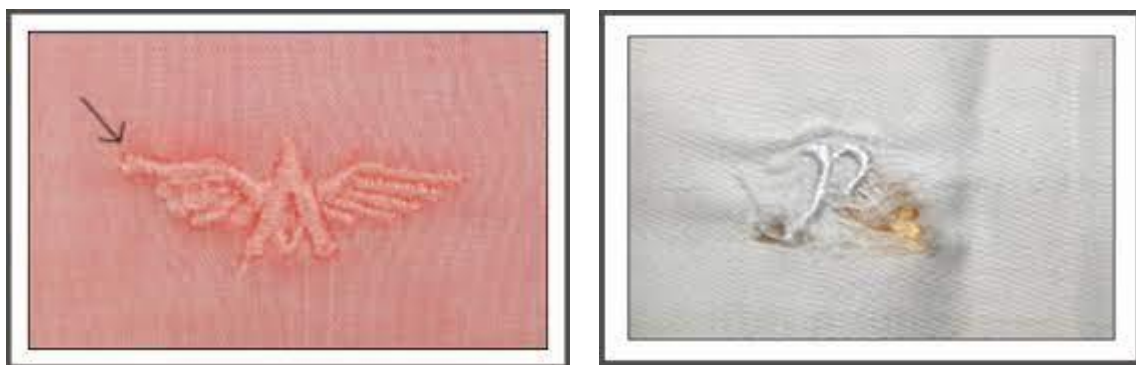


Figure 2.24: Bunching At the corner

Chapter: 3

Methodology

3.1. Meterials

In this thesis, 50 inspection reports were analyzed to identify various defects in finished garments. The following inspections were conducted –

- Product of workmanship.
- Product of packaging

Product Name: Legines

3.2.Methods

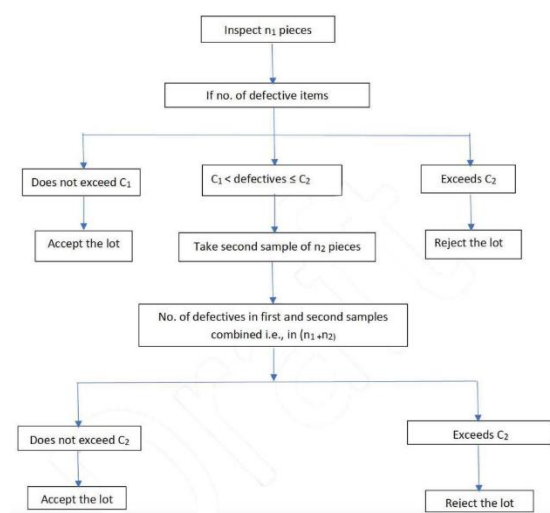
To analyze these samples, the Acceptable Quality Level (AQL) system was employed. The AQL procedure is a statistical method utilized in quality control to establish the highest permissible number of defective items in a batch or sample that is deemed acceptable. The following is a generalized methodology for implementing an AQL procedure:

- Set AQL level: Determine the acceptable quality level for the product process. This involves setting the AQL, which is the maximum number or percentage of defective items that will be accepted.
- Determine sample size: Based on the AQL level, determine the appropriate test sample size. This is typically determined using statistical tables or software, considering factors such as the desired confidence level and the acceptable quality level.
- Random sampling: Randomly select items from the batch or production to check. Random sampling ensures that the sample is representative of the entire lot.
- Check and classify: Test each sample item against predefined quality criteria. This may involve visual inspection, measurements, or other tests depending on the nature of the product or process.
- Count defects: Count the number of defective items in the sample. A defective item is one that does not meet specified quality standards.
- Compare with AQL: Compare the number of defective items in the sample with the AQL level. If the number of defects is within the acceptable range determined by the

AQL level, the batch or production run is considered acceptable. If the number of defects exceeds the AQL, further action may be required, such as reworking, sorting, or discarding the entire shipment.

- **Statistical analysis:** Perform statistical analysis to estimate the confidence level associated with the AQL process. This analysis provides insight into the reliability of the AQL results and helps determine the confidence level in accepting or rejecting a shipment.
- **Documentation and reporting:** Record the results of the AQL procedure, including sample size, number of defects, AQL level, and any statistical analysis performed. This information is essential for quality control and monitoring purposes.
- **Continuous improvement:** Use the results of the AQL process to identify areas for improvement in the manufacturing process or product design. Feedback from the AQL process can be used to make necessary adjustments and reduce the occurrence of errors in future batches.

3.2.1. Inspection Rule and Process Sequence



This chart is used to determine the sample size and acceptable range for any garments Lot.

Single Sampling Plan for Normal Inspection, ANSI/ASQ Standard Z1.4-2003 (R2013)							
Sample Size Code Letters							
Lot Size	General Inspection Levels			Special Inspection Levels			
	GI	GII	GIII	S1	S2	S3	S4
2 to 8	A	A	B	A	A	A	A
9 to 15	A	B	C	A	A	A	A
16 to 25	B	C	D	A	A	B	B
26 to 50	C	D	E	A	B	B	C
51 to 90	C	E	F	B	B	C	C
91 to 150	D	F	G	B	B	C	D
151 to 280	E	G	H	B	C	D	E
281 to 500	F	H	J	B	C	D	E
501 to 1200	G	J	K	C	C	E	F
1201 to 3200	H	K	L	C	D	E	G
3201 to 10000	J	L	M	C	D	F	G
10001 to 35000	K	M	N	C	D	F	H
35001 to 150000	L	N	P	D	E	G	J
150001 to 500000	M	P	Q	D	E	G	J
500001 and over	N	Q	R	D	E	H	K

Code letter	Sample size	1.0	1.5	2.5	4.0	6.5
		A	2	≤0	≤0	≤0
B	3	≤0	≤0	≤0	≤0	≤0
C	5	≤0	≤0	≤0	≤0	≤1
D	8	≤0	≤0	≤0	≤1	≤1
E	13	≤0	≤0	≤1	≤1	≤2
F	20	≤0	≤1	≤1	≤2	≤3
G	32	≤1	≤1	≤2	≤3	≤5
H	50	≤1	≤2	≤3	≤5	≤7
J	80	≤2	≤3	≤5	≤7	≤10
K	125	≤3	≤5	≤7	≤10	≤14
L	200	≤5	≤7	≤10	≤14	≤21
M	315	≤7	≤10	≤14	≤21	≤21
N	500	≤10	≤14	≤21	≤21	≤21
P	800	≤14	≤21	≤21	≤21	≤21
Q	1,250	≤21	≤21	≤21	≤21	≤21
R	2,000	≤21	≤21	≤21	≤21	≤21

Chart used to determine Sample size and Acceptable range

3.2.1. Order quantity & inspection quantity and level

Order Quantity	Inspected Size	Inspected Quantity
8500	S	200
35000	M	315
70000	L	500
95000	XL	500

3.2.2. Inspection Level:

There are 3 inspection level. They are :

- ✓ General Inspection Level-I
- ✓ General Inspection Level-II
- ✓ General Inspection Level-III

General Inspection Level II in AQL testing is a widely used approach for quality control in manufacturing processes. Here's a breakdown of its key aspects:

1. **Purpose:** General Inspection Level II is employed to determine whether a batch or lot of products meets accepted quality criteria. It aims to strike a balance between the assurance of quality and the resources (cost and time) required for inspection.
2. **Sampling Plan:** Associated with General Inspection Level II is a specific sampling plan. This plan outlines the number of samples to be examined and sets acceptance and rejection criteria based on the AQL table. The table provides guidance on determining the appropriate sample size and pass/fail ratio based on batch size and the desired confidence level.
3. **Sampling Size:** Compared to the more stringent Level I, Level II typically involves a smaller number of units to be sampled. However, it still provides sufficient assurance about the quality of the lot.
4. **Pass/Fail Criteria:** The pass/fail criteria are established based on the AQL standard being followed. These criteria determine whether the lot meets the accepted quality standards.
5. **Variability:** The sample size and pass/fail criteria may vary depending on the specific AQL standard being applied. Different standards provide detailed guidelines and tables to help select the appropriate sampling plan based on factors such as lot size, level of control, and desired AQL.
6. **Factors Influencing Choice:** The choice of the level of control, whether Level II or another level, depends on factors such as the importance of the product, customer requirements, and the acceptable level of risk.
7. **Practicality and Acceptance:** General Inspection Level II is widely used across industries as a practical and widely accepted approach to quality control in manufacturing processes. It provides a systematic method for determining whether a lot or batch of products meets accepted quality standards while balancing control effectiveness with the desired level of confidence in the results.

Chapter:4

Result and Discussions

4.1. Defect of Legines for Sample Size ‘S’ (Workmanship)

Order Quantity	Number Of Inspection	Inspected Item	Major Defect	Minor Defect	Critical Defect
8500	1	200	08	11	0
	2		07	12	0
	3		09	13	0
	4		07	11	0
	5		06	12	0
	6		09	13	0
	7		07	15	0
	8		08	12	0
	9		10	13	0
	10		07	11	0

It seems like you're describing a quality inspection process where 200 samples out of a total production batch of 8500 workmanship products are inspected. AQL (Acceptable Quality Level) standards are applied to a subset of these samples, typically 10, to identify major, minor, and critical defects.

In this case, since no critical defects were found in the entire order quantity, it indicates that the production quality meets acceptable standards. This is a positive indication of the overall quality of the product. However, it's important to note that while critical defects were absent, there may still have been minor or major defects identified during the inspection process.

Evaluating the frequency and severity of these defects is essential for determining the overall quality of the production batch.

4.2. Defect of Legines for Sample Size ‘M’ (Workmanship)

Order Quantity	Number Of Inspection	Inspected Item	Major Defect	Minor Defect	Critical Defect
35000	1	315	10	14	0
	2		11	13	0
	3		12	15	0
	4		13	16	0
	5		11	17	0
	6		12	15	0
	7		13	14	0
	8		11	18	0
	9		10	15	0
	10		10	13	0

It appears that you're describing another quality inspection process where 315 samples out of a total production batch of 35,000 workmanship products are inspected. AQL standards are applied to a subset of these samples, typically 10, to identify major, minor, and critical defects.

In this scenario, finding no critical defects in the entire order quantity is a positive indicator of the production quality meeting acceptable standards. It suggests that the manufacturing process has maintained a high level of quality control, as critical defects, which could significantly impact the functionality, safety, or usability of the products, were not present.

However, it's important to consider the presence of any major or minor defects identified during the inspection process. While the absence of critical defects is a good sign, the frequency and severity of major and minor defects should also be evaluated to comprehensively assess the overall quality of the production batch.

4.3. Defect of Legines for Sample Size ‘L’ (Workmanship)

Order Quantity	Number Of Inspection	Inspected Item	Major Defect	Minor Defect	Critical Defect
70000	1	500	19	27	0
	2		18	25	0
	3		17	26	0
	4		20	23	0
	5		18	22	0
	6		20	25	0
	7		21	26	0
	8		20	27	0
	9		21	20	0
	10		22	25	0

Inspecting 500 samples out of a total production batch of 70,000 workmanship products is a significant sampling effort. Applying AQL standards to 10 of these samples allows for the identification of major, minor, and critical defects.

The absence of critical defects across the entire order quantity is a positive indication of the overall production quality. Critical defects, which have the potential to significantly impact the functionality, safety, or usability of the products, were not found during the inspection process.

However, it's essential to also consider the presence of major and minor defects. While the absence of critical defects is promising, the frequency and severity of major and minor defects should be evaluated to fully assess the production batch's quality. Minor defects, although less critical, can still affect the product's appearance, durability, or customer satisfaction. Therefore, a thorough analysis of all defect types is necessary to ensure the product meets the required quality standards.

4.4. Defect of Legines for Sample Size ‘XL’ (Workmanship)

Order Quantity	Number Of Inspection	Inspected Item	Major Defect	Minor Defect	Critical Defect
95000	1	500	20	26	0
	2		20	23	0
	3		22	25	0
	4		21	26	0
	5		19	27	0
	6		18	28	0
	7		17	21	0
	8		19	20	0
	9		20	26	0
	10		21	27	0

Inspecting 500 samples from a production batch of 95,000 workmanship products is a substantial effort to assess quality. Applying AQL standards to 10 of these samples allows for the identification of major, minor, and critical defects.

The absence of critical defects across the entire order quantity is a positive indication of overall production quality. Critical defects, which have the potential to significantly impact functionality, safety, or usability, were not found during the inspection process.

However, it's crucial to also consider the presence of major and minor defects. While the absence of critical defects is promising, the frequency and severity of major and minor defects should be evaluated to fully assess the production batch's quality. Minor defects, although less critical, can still affect the product's appearance, durability, or customer satisfaction. Therefore, a comprehensive analysis of all defect types is necessary to ensure the product meets the required quality standards.

4.5. Defect of T Legines for Sample Size ‘S’ (Packaging)

Order Quantity	Number Of Inspection	Inspected Qty	Major Defect	Minor Defect	Critical Defect
8500	1	200	0	0	0
	2		0	0	0
	3		0	0	0
	4		0	0	0
	5		0	0	0
	6		0	0	0
	7		0	0	0
	8		0	0	0
	9		0	0	0
	10		0	0	0

Inspecting 200 samples from a production batch of 8500 packaging products is a significant effort to assess quality. By applying AQL standards to 10 of these samples, the absence of major, minor, and critical defects is a positive indication of high production quality.

Critical defects, which could compromise the integrity or safety of the packaging, were not found during the inspection process. Similarly, the absence of major defects suggests that the packaging meets the necessary functional requirements and specifications.

While minor defects may have less impact on the packaging's performance, their absence further contributes to the overall quality of the production batch. Minor defects, such as slight cosmetic imperfections, can still affect customer perception and satisfaction.

Overall, the absence of major, minor, and critical defects in the inspected samples provides confidence in the quality of the production batch. However, continuous monitoring and quality control measures should be maintained to uphold these high standards in future production runs.

4.6. Defect of T Legines for Sample Size ‘M’ (Packaging)

Order Quantity	Number Of Inspection	Inspected Qty	Major Defect	Minor Defect	Critical Defect
35000	1	315	0	0	0
	2		0	0	0
	3		0	0	0
	4		0	0	0
	5		0	0	0
	6		0	0	0
	7		0	0	0
	8		0	0	0
	9		0	0	0
	10		0	0	0

Inspecting 315 samples from a production batch of 35,000 packaging products demonstrates a thorough effort to assess quality. Applying AQL standards to 10 of these samples and finding no major, minor, or critical defects is a strong indication of high production quality. The absence of critical defects is particularly significant, as it suggests that the packaging meets safety standards and will adequately protect the contents during handling and transport.

Major defects, which could impact functionality or usability, were also not found, reinforcing the quality of the production batch.

Minor defects, while less impactful than major or critical ones, can still affect customer satisfaction and perception. The absence of minor defects in the inspected samples further underscores the high quality of the packaging products.

Overall, the inspection results provide confidence in the quality of the production batch. However, ongoing quality control measures and monitoring should be maintained to ensure consistent quality across future production runs.

4.7. Defect of T Legines for Sample Size ‘L’ (Packaging)

Order Quantity	Number Of Inspection	Inspected Qty	Major Defect	Minor Defect	Critical Defect
70000	1	500	0	0	0
	2		0	0	0
	3		0	0	0
	4		0	0	0
	5		0	0	0
	6		0	0	0
	7		0	0	0
	8		0	0	0
	9		0	0	0
	10		0	0	0

Inspecting 500 samples from a production batch of 70,000 packaging products demonstrates a comprehensive effort to assess quality. Applying AQL standards to 10 of these samples and finding no major, minor, or critical defects is a strong indicator of high production quality.

The absence of critical defects is particularly significant, as it suggests that the packaging meets safety standards and will effectively protect the contents during handling and transport. Major defects, which could impact functionality or usability, were also not found, reinforcing the quality of the production batch.

Minor defects, although less impactful than major or critical ones, can still affect customer satisfaction and perception. The absence of minor defects in the inspected samples further emphasizes the high quality of the packaging products.

Overall, the inspection results provide confidence in the quality of the production batch. However, ongoing quality control measures and monitoring should be maintained to ensure consistent quality across future production runs.

4.8. Defect of T Legines for Sample Size ‘XL’(Packaging)

Order Quantity	Number Of Inspection	Inspected Qty	Major Defect	Minor Defect	Critical Defect
95000	1	500	0	0	0
	2		0	0	0
	3		0	0	0
	4		0	0	0
	5		0	0	0
	6		0	0	0
	7		0	0	0
	8		0	0	0
	9		0	0	0
	10		0	0	0

Inspecting 500 samples from a production batch of 95,000 packaging products demonstrates a rigorous approach to quality assurance. Applying AQL standards to 10 of these samples and finding no major, minor, or critical defects is a positive indication of high production quality. The absence of critical defects is particularly noteworthy, as it signifies that the packaging meets safety standards and will effectively safeguard the contents during handling and transit.

Major defects, which could compromise functionality or usability, were also not detected, reaffirming the quality of the production batch.

Minor defects, while less significant than major or critical ones, can still impact customer satisfaction and perception. The absence of minor defects in the inspected samples further underscores the high quality of the packaging products.

Overall, the inspection results ensure the quality of the production batch. However, ongoing quality control measures and monitoring should remain in place to ensure consistent quality across future production runs.

4.9. Name Of Defect For sample Size ‘S’ (Quantity 8500)

Name of Defect	Major Defect	Minor Defect	Critical Defect
Uncut Thread	5	09	0
Open Seam	4	08	0
Ironing Mark	3	05	0
Untrimmed Seams	6	06	0
Down Stitch	2	05	0
Color Stain	6	03	0
Raw Edge	5	04	0
Uneven Printing	3	05	0
Puckering	6	06	0
Oil Spot	5	07	0
Misplaced of Level	4	04	0
Skip Stitch	3	03	0
Float	2	03	0
Main label Spot	5	06	0
Poor Neck Shape	5	07	0
Fold Mark	3	08	0
Skip Stitch	4	04	0
Binding Width Uneven	3	03	0
Dirty Stain	2	09	0
Seam Allowance	1	06	0

Performing a final random inspection on a sample of 200 units from a production batch of 8,500 quantities is a crucial step in ensuring product quality. While the inspection revealed both major and minor defects, the absence of critical defects indicates that the overall production system is functioning effectively.

Identifying almost 20 types of defects across ten inspection operations underscores the thoroughness of the inspection process. Major defects, although present, did not reach a critical level that would warrant rejection of the entire batch. Minor defects, while less significant, and still require attention to prevent them from affecting customer satisfaction. The random selection of samples ensures that the inspection is unbiased and representative of the entire production batch. This approach provides confidence that the inspected sample accurately reflects the overall quality of the products.

While the presence of defects is a concern, it presents an opportunity for improvement in the production process. Addressing the identified issues and implementing corrective measures can lead to enhanced product quality and customer satisfaction in future production runs.

4.10. Name Of Defect For sample Size ‘M’ (Quantity 35000)

Name of Defect	Major Defect	Minor Defect	Critical Defect
Uncut Thread	7	8	0
Open Seam	6	9	0
Ironing Mark	5	6	0
Untrimmed Seams	8	8	0
Down Stitch	6	9	0
Color Stain	5	7	0
Raw Edge	7	10	0
Uneven Printing	9	5	0
Puckering	6	5	0
Oil Spot	5	6	0
Misplaced of Level	3	8	0
Skip Stitch	6	9	0
Float	6	6	0
Main label Spot	5	8	0
Poor Neck Shape	7	6	0
Fold Mark	6	7	0
Skip Stitch	5	7	0
Binding Width Uneven	2	9	0
Dirty Stain	4	8	0
Seam Allowance	5	6	0

Conducting a final random inspection on a sample of 315 units from a production batch of 35,000 quantities is a significant step in quality control. While the inspection identified both major and minor defects, the absence of critical defects suggests that the overall production system is functioning adequately.

Discovering almost 20 types of defects across ten inspection operations underscores the thoroughness of the inspection process. Although major and minor defects were present, they did not reach a critical threshold that would necessitate rejecting the entire batch. However, addressing these defects is essential to maintain product quality and customer satisfaction.

The random selection of samples ensures that the inspection is unbiased and representative of the entire production batch. This approach provides confidence that the inspected sample accurately reflects the overall quality of the products.

While the presence of defects is a concern, it serves as an opportunity for process improvement. By addressing the identified issues and implementing corrective measures, manufacturers can enhance product quality and mitigate the risk of defects in future production runs.

4.11. Name Of Defect For sample Size ‘L’ (Quantity 70000)

Name of Defect	Major Defect	Minor Defect	Critical Defect
Uncut Thread	10	13	0
Open Seam	11	14	0
Ironing Mark	12	15	0
Untrimmed Seams	10	12	0
Down Stitch	11	11	0
Color Stain	09	12	0
Raw Edge	10	13	0
Uneven Printing	08	09	0
Puckering	09	16	0
Oil Spot	10	10	0
Misplaced of Level	09	13	0
Skip Stitch	10	12	0
Float	08	12	0
Main label Spot	12	12	0
Poor Neck Shape	13	11	0
Fold Mark	12	13	0
Skip Stitch	10	10	0
Binding Width Uneven	09	12	0
Dirty Stain	08	11	0
Seam Allowance	07	15	0

Performing a final random inspection on a sample of 500 units from a production batch of 70,000 quantities is a crucial quality control measure. While the inspection identified both major and minor defects, the absence of critical defects indicates that the overall production system is operating satisfactorily.

The detection of nearly 20 types of defects across ten inspection operations highlights the thoroughness of the inspection process. Although major and minor defects were present, they did not reach a critical level that would warrant rejecting the entire batch. However, it's essential to address these defects to maintain product quality and customer satisfaction.

The random selection of samples ensures the inspection's impartiality and represents the overall quality of the products accurately. This approach instills confidence that the inspected sample is a fair representation of the entire production batch.

While the presence of defects is concerning, it presents an opportunity for process improvement. By addressing the identified issues and implementing corrective actions, manufacturers can enhance product quality and minimize the risk of defects in future production runs.

4.12 Name of Defect For sample Size 'XL' (Quantity 95000)

Name of Defect	Major Defect	Minor Defect	Critical Defect
Uncut Thread	16	15	0
Open Seam	12	13	0
Ironing Mark	14	14	0
Untrimmed Seams	10	10	0
Down Stitch	10	09	0
Color Stain	09	14	0
Raw Edge	12	15	0
Uneven Printing	09	12	0
Puckering	14	14	0
Oil Spot	10	15	0
Misplaced of Level	07	10	0
Skip Stitch	06	11	0
Float	06	09	0
Main label Spot	11	13	0
Poor Neck Shape	11	12	0
Fold Mark	08	11	0
Skip Stitch	09	12	0
Binding Width Uneven	05	12	0
Dirty Stain	09	13	0
Seam Allowance	08	14	0

Conducting a final random inspection on a sample of 500 units from a production batch of 95,000 quantities is a significant quality assurance measure. While both major and minor defects were identified, the absence of critical defects suggests that the overall production process is functioning effectively.

The detection of nearly 20 types of defects across ten inspection operations underscores the thoroughness of the inspection process. While major and minor defects were present, their prevalence did not reach a critical threshold that would necessitate rejecting the entire batch. Nonetheless, addressing these defects is crucial to maintaining product quality and meeting customer expectations.

The random selection of samples ensures the inspection's impartiality and ensures that the inspected sample is a fair representation of the entire production batch.

Although the presence of defects is a concern, it provides an opportunity for process improvement. By addressing the identified issues and implementing corrective measures, manufacturers can enhance product quality and reduce the likelihood of defects in future production runs.

4.13 Total number of defect

Sample Size (Quantity)	Total Major defect	Total Minor Defect	Total Critical defect
S (8500)	77	111	0
M (35000)	113	147	0
L (70000)	198	246	0
XL (95000)	196	248	0

It's noted that the minor defect count is greater than the major defect count in all cases. Additionally, no critical defects were detected during the inspection process. This suggests that while there are issues to address, they may not be severe enough to impact the overall quality of the products.

Chapter:5

Conclusions

5.1. Conclusion

To whole up, the Absconds in Ready-Made pieces of clothing think about given important bits of knowledge into the troubles and complexities of item quality administration within the material & clothing industry. In this ponder, we inspected different sorts of abandons, their root causes and impacts on producers and buyers. One of the key discoveries is the significance of fabricating forms in deciding wrapped up piece of clothing quality. In expansion to influencing the by and large appearance and feel, these absconds can influence the toughness, usefulness and convenience of the article of clothing. We have too found that absconds can be the result of human mistake, machine disappointment, destitute quality control measures and moo quality materials. To address these issues, a all-encompassing approach is required that incorporates preparation of representatives, customary support of the machine, strict quality control measures and solid provider connections. The repercussions of ready-made pieces of clothing defects are far-reaching. Producers have to bear the burden of revamping or transfer of inadequate items, the taken a toll of client returns, and reputational harms. In expansion, inadequate products can lead to unsatisfactory clients who may feel awkward, disappointed or lose certainty within the brand within the long run. This could have a negative effect on deals, brand dependability, and general benefit. To play down the effect of abandonment and their related results, producers must execute strong quality protocols. Contracting gifted specialist's Standard reviews and reviews, utilizing cutting-edge innovation like programmed sewing machines and quality control machines, cultivating a culture of quality awareness inside the organization, Collaborating with providers and continuous advancement ventures. Avoiding abandons and moving forward the quality of items, Shoppers play a basic part in settling blunders When buyers are mindful of quality markers such as textures, development strategies and care instructions, they are more likely to create educated acquiring choices. Giving producers with input approximately found surrenders can help make strides the quality of their items and benefit. The Consider of Absconds in Ready-Made Clothing Illustrates the Significance of Maintaining High Quality Levels within the Material and Clothing Industry. The proper fabricating forms, quality control measures and educated shopper choices can diminish absconds, improve item quality, upgrade client fulfillment, and improve the brand's notoriety. Surrenders can be caused by a variety of factors, but by recognizing and addressing the root causes, producers can point to deliver clothing that meets or surpasses client desires, coming about in long-term advertise victory and supportability.

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