



**Faculty of Engineering
Department of Textile Engineering**

Project (Thesis) on
Study on Quality Issues in Denim Production

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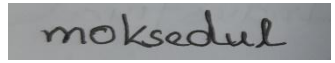
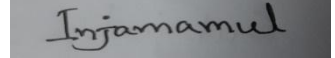
A thesis submitted in partial fulfillment of the requirements for the degree of

**Bachelor of science in Textile Engineering
Advance Apparel Manufacturing Technology**

DECLARATION

We hereby declare that, this project has been done by us under the supervision of Dr. Md. Mahbubul Haque, Professor, Department of TE, Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree.

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ABSTRACT

The project is on the "Quality Issues in Denim Production. This study examines what is significant for high quality of Denim, and what processes and factors affects the intrinsic quality of the Denim Fabric. Based on this, compilations of reclaim statistics was made and interviews and quality testing was conducted to see if high quality requirements is key to both produce denim of good quality and to reduce the number of complaints. Our Denim industry is an incorporated industry so it is compulsory to check the procedures from the earliest starting point. It moves toward becoming from the yarn to the completed item. We are here attempted to represent the quality parameter in the Denim division.

Quality management is an important part of the day-to-day business of a company and should permeate the entire organization and all processes. In order to create denim with high quality, quality testing is an important part of a quality management. Quality tests are made to ensure that the products meet the demands and expectations on its properties. Quality tests also play an important role in the compilation and analysis of customer reclaims. Despite the quality and quality tests, there is a risk that dissatisfied customers reclaim products they are not happy with. To relate customer claims against the quality of tests is a good way to evaluate what the problem is, or if it even is a problem.

The study showed that high quality could be the solution to ensure the production of denim with high quality. However, the problem is complex and therefore, the solution to reduce claims and high-quality products to be something else or part of the solution. That goes for any company to be familiar with the underlying quality dimensions and based on that analyse where the critical points are found in their product development and manufacturing process.

For the company of this study, the authors consider that the solution does not lie in raising quality requirements, but rather that the sewing should be improved and more quality control over garment measurement lists should be made. Quality tests cannot

prove a lack of quality material and thus the authors consider that much of the claims are due to good will.

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CHAPTER-01
INTRODUCTION

INTRODUCTION

This section gives an introduction to the study. It also declares the purpose and the base of this study and restrictions that were applied.

The essence of the design of denim is variation. The fit, the color and most of all, the finishing processes area unit evermore altered. Denim finishes area unit a company's possibility to make a novel product. each detail and call concerning the developing method of a brand-new denim vogue area unit being designed into the general quality of the garment. If the merchandise doesn't meet the expectations of the purchasers, they're going to get dissatisfied and a few of the purchasers can come the merchandise with criticism.

During all processes of the assembly chain, many actor's area unit involved; designers, pattern manufacturers, quality department, consumers and suppliers. to those named actors even more individuals area unit another, creating the assembly chain long and therefore the activities reach so much beyond a company's own walls.

To produce and maintain top quality jeans, the standard management is a very important part of the merchandise developing- and production section. the standard management are often expressed in many alternative ways in which, from quality management systems to quality requirements and tests. Quality tests area unit vital to secure the product's pledged properties, however additionally to create it potential to judge client complaints and claims. By take a look rating the product and place the test leads to regard to the reclaims, analyses will be created on whether or not the reclaims area unit valid or not.

How will a corporation, to a most extent, avoid obtaining discontent customers, and by that decrease the amount of denim reclaims? will the answer be top quality requirements on the product's physical quality?

PURPOSE OF THESIS:

The purpose of this thesis is to check however prime quality is ensured and whether or not the increase of quality necessities may cause a decrease of reclaims. The question of this matter may come upon as straight forward, although the fact is far a lot of complex; thus, the study conjointly aims to outline prime quality of denim and what essential aspects that affect the result of the producing of denim. These essential aspects are considered to be identical for all suppliers within the denim industry; the study can address these issues during a general method and illustrate the issues from the perspective of specific denim attire provider.

Three queries kind a base for this study:

- What's prime quality for denim?
- What are the essential aspects of high denim quality?
- However, will prime quality be secured?

The 3 queries can cause the solution and conclusion of the most question: Can increasing quality necessities cause a decrease of reclaims on denim for a complete supplier?

CHAPTER-02

LITERATURE SURVEY

DENIM FABRICS:

Denim is one among the world's most painting materials. the instant you say the words "denim jeans," everybody around you is aware of what you're talking regarding. Denim is in style across national and cultural boundaries, and also the denim jean has become an emblem of American culture the globe over.

What, exactly, is denim, however? wherever did this cloth return from, and why has its quality endured intense throughout the decades? We'll dive into of these queries and additional as we tend to tell you everything you would like to understand regarding denim cloth.

Denim cloth has remained in wide use in jeans since the decennium. No different article of clothing item has endured at intervals American culture like blue jeans, that makes that combine of Apostle jeans in your closet one thing of a heritage whole.

Over time, American textile producers started creating different attire things out of denim, and lately, you'll be able to even purchase home ornament product created with this sturdy and aesthetically appealing cloth. whereas production of blue jeans was once restricted to the u. s., the late 20th-century producing exodus saw the bulk of denim production transfer overseas.

Denim cloth currently has too several variations to list, and it's been mixed with different cloth and weave designs ad nauseam as designers have worked feverishly to develop the most recent trends in denim fashion. All an equivalent, ancient Apostle 501s stay unbelievably in style round the world, and a distinct segment business has emerged that revolves around "raw denim," that is an element of each hipster's patois book. international interest in denim remains robust, and it's doubtless that this weave can still be created as long as cotton remains a significant textile product.



DENIM QUALITY:

The intrinsic qualities of jeans are unit tormented by 2 main groups; material and production. By dividing into these 2 teams once researching quality, it'll be easier to analyse attainable enhancements.

The material class holds fibre, yarn and material structure while production consists of the assembly part with pre-treatment, creating (cutting, sewing, trimming) and finishing, see Figure one. many completely different |completely different} finishes or washes are often applied to jeans to attain different appearance. several of the washes aim to offer the jeans a worn and torn look.

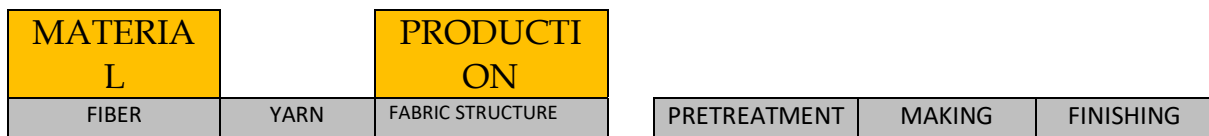
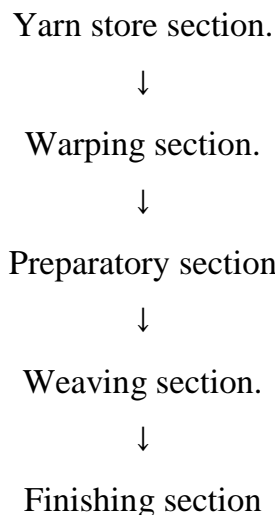


Figure: Main classes and sub-categories of factors that influence the intrinsic consistency of denim jeans.

Fibre, material and garment properties are unit tested with the aim to make sure each high sturdiness and quality. sturdiness properties are often tested in laboratories, however check results from the laboratories don't invariably accurately predict however the garment can perform once utilized by customers. The check results can solely indicate however the material could perform, it's conjointly attainable to note materials or clothes that don't stand the quality tests.

Denim fabric production sections:





Inspection and Fabric store.

I. Warping section:

Cone from winding.



Creeling



Control system



Reed



Measuring device



Winding (rope/sheet) on beam.

II. Preparatory section:

Scouring.



Bleaching.



Dyeing (indigo, black, bottoming, topping, ash etc.)



LCB (Only for rope denim)

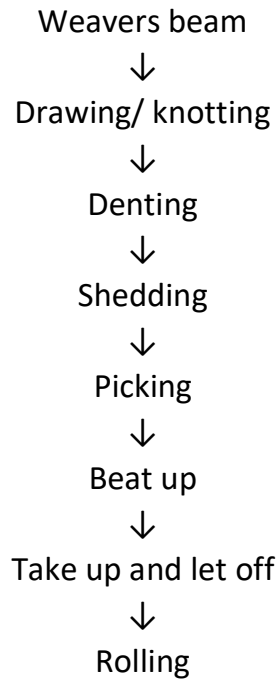


Sizing

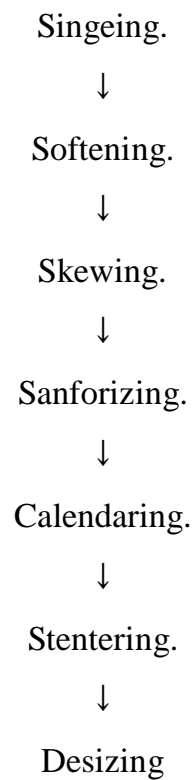


Weavers beam

III. Weaving section:



IV. Finishing section





Mercerization.



Inspection and folding

QUALITY:

According to the standard ISO 9004-2, quality is that the essential nature of one thing, associate degree inherent or peculiarity or property, superiority, excellence, or perceived level important. actual characteristics knowledgeable as quality options vary between individuals. every person has their own references of quality, some individuals realize smart sturdiness and practicality nearly as good quality, for others, enticing style and brand standing is sweet quality. Costumers believe a large type of aspects to determine if the merchandise meets their quality references. the standard characteristics of a product need to be incorporated so the purchasers want and can to get the merchandise may be cost-efficient.

The broad idea of quality may be divided into 3 subcategories:

- Intrinsic
- Extrinsic
- Perceived

Intrinsic quality is made throughout development and production and is betting on materials, strategies and processes. outside quality isn't a neighbourhood of the particular product; it's everything round the product like whole, shop, price, selling, selling and reply of outlets. Perceived quality is that the intrinsic and outside quality along.

American Society for Quality (ASQ) says-

Quality means excellence in products and services, especially to the extent that they comply with requirements and satisfy customers.

Some of the most popular definitions for quality are listed below:

- A grade of excellence
- Conformance to demands
- Totality of features that function to fulfill a need
- Fitness to use for
- Delighting clients

Quality Control:

"Quality denotes an excellence in product and services, particularly to the degree they change to needs and satisfying term quality refers the excellence of a product. after we say the standard of a product is good. we have a tendency to mean that the merchandise is sweet for the aim that it's been created.

Control means that to examine or verify and hence to manage.

So, Quality control is the synthetic and regular control of the variable which affect the quality of a product customers."

The operational techniques and activities that sustain the standard of a product or service so as to satisfy given necessities. It consists of quality coming up with, information assortment, information analysis and implementation and is applicable to all or any phases of product life cycle; style, producing, delivery and installation, operation and maintenance.

Quality is of prime importance in any facet of business. Customers demand and expect price for money. As producers, there should be a relentless endeavour to supply work of excellent quality. "The systems needed for programming and coordinative the efforts of the assorted teams in a corporation to keep up the requisite quality". in and of itself internal control is seen because the agent of Quality Assurance or Total internal control. during this business internal control is practiced right from the initial stage of sourcing raw materials to the stage of ultimate finished product. For textile business product quality is calculated in terms of quality and normal of fibres, yarns, cloth construction, color fastness. but quality expectations for export are associated with the sort of client segments and therefore the shops. internal control and standards are one among the foremost vital aspects of the content of any job and so a serious think about coaching.

Objectives of Quality Control:

- To produce the quality product required.
- To satisfy the demand from the client.
- To decrease the cost of production.
- To decrease wastage.
- At minimal expense, to gain full benefit.

Establishing the standard (Quality) Requirements:

The first step in quality control is to understand, establish & accept the quality requirements of the customers. The following steps are involved in this.

- Getting customers/ Buyer specifications regarding the quality
- Referring our past performance
- Discussing with the Quality Control Department
- Discussing with the Production Department
- Giving the Feed Back to the customers/ Buyer
- Receiving the revised quality requirements from the customers/ Buyer
- Accepting the quality parameters

AQL- Acceptable Quality Level:

Accepted Quality Level (AQL) may be a internal control tool for review of product. As earlier mentioned, product (in this case jeans) is often inspected in many alternative ways. For evaluations, tests or alternative kinds of comparisons, AQL may be a smart tool to manage however well the product interchange relevance the standard needs. The AQL can tell the quantity of product that ought to be inspected and the way several defects that are accepted, instead of dictating what tests ought to be created. supported the AQL, irregular inspections are created, which provides the corporate a result that indicates the standing for a majority of the product.

The amount of product that may get inspected and the way several faults that ar accepted are determined by a mix of the AQL-level, the review level and also the size of the order. every company chooses what levels they require to figure with. Associate in Nursing AQL of one,5 won't settle for faults in additional than one,5 you look after the inspected ton. There are 3 review levels; I, II and III. review level II is most ordinarily used, however at less comprehensive inspections level I is employed, and at additional comprehensive inspections level III is employed.

Defects are classified by their severity; minor, major or important. 3 minor defects are up to one major defect. If the quantity of defected product within the inspected ton exceeds the AQL, the order ought to be rejected, otherwise it is often accepted.

Quality Assurance:

The goal of quality assurance that necessities for associate item or management which will be satisfied by coming up with exercises that dead in a very quality work. it's the deliberate valuation, connection with a typical, checking of constructing method and a connected criticism circle that gives confusion remedial action. internal control relation is appeared otherwise, which is cantered on procedure points.

The distinction between quality assurance and quality control:

S/L	Comparison	Quality Assurance	Quality Control
01	Definition	Quality assurance could be a continuous set of method wherever observance on method of production.	Quality control may be a technical method wherever confirming product quality and normal.
02	Responsibility	The responsibility of the entire team for quality assurance is.	Quality control is that the responsibility solely quality team.
03	Activity	Quality assurance will simply resolve method faults or error. On the opposite hand QC method can't resolve whole results. Therefore, this method is understood as low-level activity.	Here, to search out out correct error or mistake for want additional examination. Therefore, this method is understood as high-level activity.
04	Aim	The main aim of QA is preventing production defect.	The main aim of QA is established production defect.
05	Start Point	Quality assurance started before production.	Quality control is started once production.
06	Process	Quality assurance is method of verification.	Quality control is method of Validation.
07	Controlling	Quality assurance dominant the specified quality.	Quality control dominant in time of production.
08	Method	Quality assurance is that the methodology of managing for quality.	Quality control is that the technique of verify the standard up to output.
09	Time Consuming	Quality assurance isn't measured as a time intense activity.	Quality control is measured as a time overwhelming activity.

What is Denim?

Denim may be a sturdy typically blue textile that's used particularly to create jeans, typically used before another noun-

- denim jeans
- denim skirt/jacket
- Shirts
- Blouses
- Jackets.

The various types of denim fabric used in the manufacture of apparel:

- ☒ Dry denim
- ☒ Selvedge denim
- ☒ Stretch denim
- ☒ Color denim
- ☒ Reverse denim
- ☒ Vintage denim
- ☒ Marble denim etc.

Yarn from Denim:

Lower check and coarse yarn are used for denim creating. Fibre quality is not nice. Denim yarn created from open finish turning framework. seemingly the foremost important attributes of the bit are its tidiness with specific thought to be to residue expel.

Yarns utilized in denim materials are termed “short-staple spun yarns,” as a result of they're fashioned from fibres having a staple length of but 2.5 inches. The cotton fibre sometimes is simply over an in. long. one in all the key items of yarn info for development and manufacture of denim is that the selection of yarn size. The terms “yarn variety,” “yarn count,” and “yarn size” are used interchangeably to ask the linear density of a given yarn.

Yarn Quality Requirements:

For the simplest stitching we'd like to select the simplest yarn or good yarn for weaving answerable free texture or quality full texture. thus we'd like to cautious regarding the yarn properties or for good yarn. The incidental yarn properties got to should be aforementioned material yarn as an ideal yarn-

1. The yarn is spherical in cross-area and is uniform on its length.
2. Yarn is created out of coaxial layers of assorted spread.
3. Each fibre pursues a standardized turbinate approach around one in every of the coaxial chamber with the goal that its sensible ways that from yarn pivot stays consistent.
4. A fiber at the center can pursue a line of the hub.
5. The hub of roundabout chambers fiber sides with yarn hub.
6. The amount of fibers or fibers crossing the unit region is consistent; that's the thickness of pressing. Fibers within the yarn are consistent at some stage in the model.
7. Every fiber within the yarn can have an analogous live of flip per unit length.
8. The yarn contains of exceptionally monumental variety of fibers. In the event that the antecedent mentioned yarn properties are missing on any yarn than the yarn ought not be allowable on weaving to create texture. Since it will not virtually actually offer you immaculate stitching wherever the yarn's parameter is obligatory to be preserved.

Yarn quality parameters, as an example,

- Evenness,
- Count
- Breaking strength,
- Elongation,
- Twist,
- Moisture contents,
- Yarn winding,
- Yarn lubrication,
- Yarn hairiness.

Yarn Count:

Count is a numerical value which is express the fineness or coarseness.

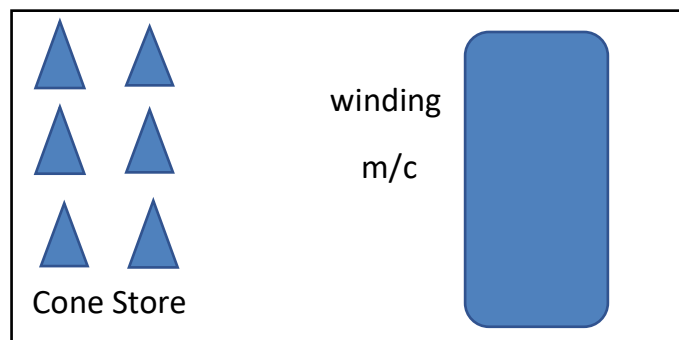
CHAPTER-03
METHODOLOGY

Winding:

Winding is the process by which the yarns are transferring from one package to another package. In Shasha Denims Ltd, there only one winding machine used for winding purposes. They mainly prepare big shape cone by using the used small shape cone.

Winding Floor Layout:

Winding m/c Brand Name: MURATA



Flowchart of Winding Process:

Yarn in small bobbin



Guide



Tension



Yarn clearer device



Stopping device



Traversing guide



Winding

Objects of winding:

- To improve the standard of yarn.
- To get an appropriate package.
- To get quality cloth.
- To clean the yarn.
- To store the yarn.
- To improve potency of yarn for next method.

Types of package winding:

- Parallel winding.
- Near parallel winding.
- Cross winding.

Warping:

Warping is that the method of transferring multiple yarns from individual yarn packages onto one package assembly.

We know the parallel winding of warp ends from many winding packages (cheese, cone) onto a common package (warp beam) is called Warping.

Process Flow Chart of warping:

Creel



Control system



Reed



Measuring Roller



Winding on a drum or beam



Direct winding

Indirect Winding

Warping Floor Layout:

There are three warping m/c on Shasha Denims Ltd. And all of the machines are running at 24 hours by maintaining three shifts.

Arranged on parallel on the floor-



Objectives of Warping:

- To increase the weavability of yarn.
- To prepare a warper beam.
- To prepare the warp ends of a continuous sheet.

Types of Warping:

There are three types of warping

- Ball Warping
- Dye Beam Warping
- Beam Warping

In this factory, Beam Warping process is following to produce expected denim fabric.

Beam Warping:

Between the winding and sizing cycles, the warping cycle is intermediate. In the next sizing step, it produces the warper beams that are combined together as a single

weaver beam. There may be approximately 500-1000 warp ends in a warper beam. Only grey or noncolored warps that need sizing are suitable for direct or beam warping. It requires only one operation, namely warping, and thus the speed and output are substantially greater than the sectional one.



Fig: Beam Warping

Working Principle of Warping:

Basically, high speed warping is performed here at Shasha Denim Ltd. We know that the yarns are removed from the yarn packages on the creel in high-speed warping or direct warping and wound directly on a beam.

This warping is separate into two stages –

1. At first the proper warping takes place: Cylinder wounds are the available threads, and another cylinder must be prepared by measuring the number of beams by expression-

$$\text{No. of beam} = \frac{\text{Total no. of warp ends}}{\text{Creel capacity.}}$$

2. The threads woven on the beam are simultaneously unwound in the second stage to form the beam of the weavers.

Yarn breakage during warping:

S/L No	Yarn Count	M/C RPM	Breakage
01	16 OE	800	7
02	12 OE/SL	800	6

03	7	800	5
04	10	800	4
05	30 Tencil	700	0

Barrier of warping efficiency:

- Warp beam set up time
- Warp yarn set up time
- Yarn breakage
- Doffing time
- Yarn wastage.



Figure: warping machine 02 of Shasha Denims Ltd.

Types of process of yarn dye:

Denim dyeing consists of three processes:

1. Rope Dyeing
2. Slasher or Sheet Dyeing
3. Beam Dyeing.

Dyeing here is performed in the process of slasher dyeing at Shasha Denims Ltd. Dyeing is a mixture of two dyes. In the denim dyeing process, indigo blue and sulphur black are used. Brown color is often used in the factory instead of indigo blue as per the buyer's requirement. For the dyeing of warp yarn, three dyeing machines are used.

Slasher Dyeing:

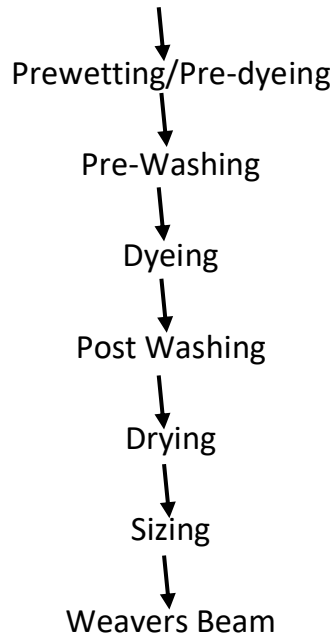
Dyes are usually colored organic chemical compounds that are responsible for the coloring of textile products that are dyed and printed. Otherwise, dyeing is called the method by which a textile material is to be modified physically or chemically, so that it appears mono-uniform colored. All commercial textile dyeing processes take place by applying a solution to the textile material or dispersing the dyes, accompanied by a certain form of fixation operation.



Figure: Beninger slasher dyeing and sizing machine1 in Shasha Denims Ltd.

Process Flowchart of Slasher Dyeing (Dyeing and Sizing):

Loading the warp beam and checking the beam number, count and program number



Dyeing process that is maintained Ltd as follows in Shasha Denims:

- Pure Indigo- Continuous Indigo Dyeing
- Bottoming- Sulphur (Bottom) & Indigo (Topping)
- Topping- Indigo (Bottoming) & Sulphur (Topping)
- Black Denim-Continuous Sulphur Black Dyeing
- Color Denim.

Dyeing Lab:

The purpose of this laboratory is to achieve continuous production of uniform dyeing without any machine fault or stoppage.

Sizing:

Sizing is that the method of applying the size material on the yarn. It is the method of giving a protective surface coating on the warp yarn to reduce yarn breakage throughout weaving.

Objectives of sizing:

- To protect the yarn from abrasion
- To improve the breaking strength of the yarn
- To increase smoothness of yarn
- To increase yarn elasticity
- To decrease hairiness
- To decrease the generation of static electricity.

Size Material:

- Starch
- Softener
- Antiseptic Agent
- Protective agent
- Wetting Agent
- Weigh agent etc.

Types of Sizing:

Pure Sizing: Weight of yarn, 3-10% of size material is use.

Light Sizing: Weight of yarn, 11-15% of size material is use.

Medium Sizing: Weight of yarn, 16-40% of size material is use.

Heavy Sizing: Weight of yarn, above 40% of size material is use.

Causes of Sizing Faults:

- Due to insufficient size concentration
- Improper size feed to the size box
- Variable size level
- Dilution of size
- Strong squeezing of warp
- High sizing speed.

Weaving:

Weaving is a process to produce woven fabric by interlacing at least two sets of threads at a right angle. Warp threads are arranged along the material length and the weft threads are then placed along the material width.

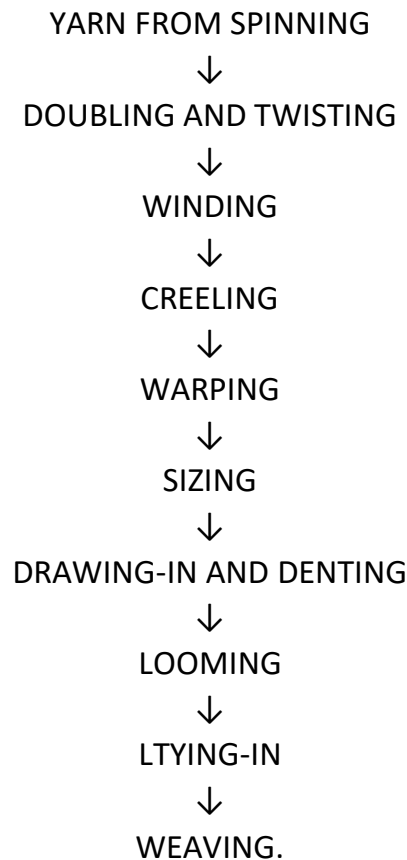
Objectives of Weaving:

- To manufacture fabric according to the structures of the weave.
- To manufacture fabric which is uniform and faultless.
- To make a fabric that is stable.

Weave design:

- Plain weave
- Twill weave
- Zigzag twill
- Herringbone twill
- Broken twill
- Satin

Process Flowchart of Weaving:



Denim fabric weaving process:

A combined process of five simple operations such as shedding, picking, beating-up, left off and take-up is the weaving process. The method of creating a fabric by interlacing threads of warp and weft is known as weaving. Interlacing of warp and weft threads, where warp yarns are white and weft yarns are colored, finishes weaving. The weaving machine used is known as the weaving machine or the loom. Weaving creates different fabrics Industry. With the use of different looms and associated devices, these fabrics are woven. Loom is a process or device that is used to create woven cloth. It is the focal point of the whole cloth production process. Warp thread is a layer in this structure.

There are two kinds of loom: between two layers of warp sheet by techniques for a suitable bearer,

1) Manual/ hand loom:

- vertical loom,
- pit loom,
- frame loom etc.

2) Modern loom:

- air jet loom,
- rapier loom,
- projectile loom,
- water jet and so on.

Finishing process of denim fabrics:

Final woven fabrics that twist on a material roll that we get at specific intervals from the weaving machine and keep an eye on the review machine. So, any possible problem with weaving can be recognized. His experiences at that level are different completing processes. For instance, for dressing and drying, brushing, searing, washing, impregnating. Brushing and scorching expels the denim fabric's polluting influences and furriness. After the completion of all completion procedures, it is sent to create a piece of clothing.

Denim Washing:

Denim washing is the aesthetic finish, which is given to the denim fabric to enhance the appeal and to provide strength. Several washing effects can be created in the case of denim washing, such as color fading with or without patchiness, seam puckering, de-pilling, crinkles, hairiness, etc. But denim washing follows a flow chart of the process, by which all the effects described can be easily achieved. The entire method flowchart of denim washing has been addressed in this article because of its significance in clothing washing. There are two types of denim wash. Such as,

- Mechanical Wash (Dry section)
- Chemical Wash (Wet section).

Mechanical Wash (Dry section): Mechanical wash contains of Whiskering, Hand-sand, Tacking, Tie, Destroy, Grinding etc.

Chemical Wash (Wet section): Chemical wash contains Stone-Enzyme wash, Bleaching, Scouring, Towel Wash, Ball Wash, Acid Wash etc.

Fabric Inspection Section:

After fabric processing, any forms of fabric defects must be examined before sending them to the dyeing section. According to the 4-point method, most cloth manufacturing businesses defect check of grey fabric.

This would reduce the number of panels or clothing rejected for fabric defects, ensuring the consistency of the finished items. The inspection of fabrics is often known as a pre-production inspection for clothing or other textile items.

Benefits of Fabric Inspection:

- The key objective of the inspection is the identification of defects and non-compliance in the production process as early as possible.
- Minimizing the loss of time and resources by fixing damaged raw materials.
- Customer supplied fabrics follow their requirements and standards; they face less refunds and recalls from consumers.
- Inspection of fabric ensures that the rejection of cut panels or rejected clothing due to fabric faults is reduced.

4-Point System:

- The 4-Point System, also referred to as the point-grading system for assessing fabric quality by the American Apparel Manufacturers (AAMA), is commonly used by apparel fabric manufacturers.
- According to the extent and importance of the flaw, the 4-Point Method awards 1, 2, 3 and 4 penalty points. For any single defect, no more than 4 penalty points may be given. The defect may be in the direction of either length or width, and the mechanism stays the same. Only serious defects are considered. Minor defects are not assigned any penalty points.
- In this method, at least 10 percent of the total rolls in the shipment should be inspected and at least one roll in each color path should be picked.

- Based on the following, fabric defects are assigned points:

Defect Size	Penalty Point
Up to 3 inches	1
3-6 inches	2
6-9 inches	3
Over 9 inches	4
Defect area for hole and opening	Point
1 inch and less	2
Over 1 inch	4

Calculation of 4 point-

Grading point = Total number of points in fabric $\times 36 \times 100$

Total length in yards \times Total width in inch

Example: A fabric roll of the 140 yards long and 48 inch wide contains the following defects:

8 defects up to 3 inch.

5 defects over 3 inch but up to 6 inch.

3 defects over 6 inch but up to 9 inch.

2 defects over 9 inch

Find out the grade of fabric based on 4-point system.

Solution :

8 defects up to 3 inch..... 8 x 1 = 08

5 defects over 3 inch but up to 6 inch..... 5 x 2 = 10

3 defects over 6 inch but up to 9 inch..... 3 x 3 = 09

2 defects over 9 inch..... 2 x 4 = 08

Total defect points..... 35

Therefore,

Points per 100 yard square =

Total points scored in roll x 36 inch

X 100

Total length yard inspected x Fabric width in inches

$$= \frac{35 \times 36}{140 \times 48} \times 100$$

= 18.75 (defect points per 100 yard square)

So, the roll is accepted.

In Shasha Denims, the fault is accepted from 10 to 40 according to the buyer requirement. Most of the buyer fixed the fault range from 10 to 20.

Major Defect:

They are not like slubs, gaps, missing yarns, yarn variation, end out, dirty yarns, and wrong yarn, there are some big defects in woven cloth. Big color defect or register printing, color spots, system stop, shading, shading smear, or concealing.

Inspection Procedure:

- Determine the amount of 20 percent for investigation).
- Select the moves that are to be investigated.
- Put the movements on the inspection machine or other gadget for analysis.
- Cut a 6-inch piece off the portion of the arrangement over the distance. Imprint the privilege with half of the strip remaining. Stop the inspection process every 50 yards and use the strip to search for any problems with concealment. Make a point to verify the portion of the deal as well. Inspect for visual defects at a speed moderate enough to discover the defects with the light on. (The texture must be tested at a moderate pace to detect imperfections in a viable way). You can need to destroy the light at times to perceive how a blemish will affect the appearance of a clothing item.
- Check that the roll contains the correct yardage as expressed by the source of the component goods.
- Check for textures that are slanted, one-sided, and bent.
- Label any flaws with hued tape to the side so they can be identified and noted efficiently.
- Record any blemishes. The weaving division works to decrease waste and guarantee consistency under the principles of the internationally renowned American 4-point system. According to the ASTM standard, texture inspection and evaluation are done under this system.

Major Faults, Problems Defects of Weaving:

Following defects are cut table and will be rejected:

- Weak yarn
- Neps
- Hairness
- Slub effect
- Twist
- Thick and thin
- Uneven yarn count
- Unlevel dyeing
- Listing
- Ball formation
- Wrong dyeing & padder tension
- Off shade
- Loose , tight , miss warp
- Double warp
- Line mark
- Tample mark
- Stop mark
- White and black mark
- Knot
- Wrong denting, reed, twill
- Hole
- Smach
- Loom bar
- Line mark
- Snarl
- Miss , broken, short pick
- Reed mark
- Cresh mark
- Wrinkle
- Shrinkage
- Skew

- Bowling
- Weavy
- Float
- Burning
- Water sport.

CHAPTER-04
EXPERIMENTAL DETAILS

Yarn used (warp) in denim production:

1. **RC (Ring Carded):** 8, 10, 11, 14, 18, 24, 28 Count.
2. **RC (Ring Carded) :** 9 Count.
3. **Siro:** 12, 16, 18 Count.
4. **RC (Ring Carded) Compact Siro:** 18 Count.
5. **RS (Ring Slub):** 8, 10, 12, 14, 16, 18 Count.
6. **RS (Ring Slub):** 8, 9, 11, 12, 14, 16 Count.
7. **MC (Multi-count):** 8, 9, 10, 12, 14 Count.
8. **RMC (Ring Multi-count):** 12 Count

SL. NO.	Count	Total Warp End	Tension (G\E)	M\C RPM
01	7	5400	80 – 84	480 - 530
02	9	5335	75 - 80	480 – 520
03	10	5348	68 – 75	470 – 510
04	12	4890	45 – 55	450 – 500
05	16	4200	32 – 38	390 – 420

Table no- 01: Details information about tension and Speed(RPM) in warping machine:

This Table indicates totally different forms of yarn counts, their varieties and tension and speed. Tension is generally 30-85, lower tension is 32 and highest tension is 84. For Higher no of count the strain is 32 – 38. relatively lower no. of count tension is 80 - 84. Here we tend to used 5 sorts of yarn like OE (open ends) ,MS (Medium slub) , RS (Ring slub) ,RC(Rotor card) , R. combed (Rotor combed).As a example for 7,9 count within the table OE/MS/RS/RC Yarns are victimisation and tension is applied in 75 - 80 and speed is 480-520. Its in hot water reducing yarn breakage. If an equivalent tension is applied in numerous count then it's extremely chance to increase yarn breakage.

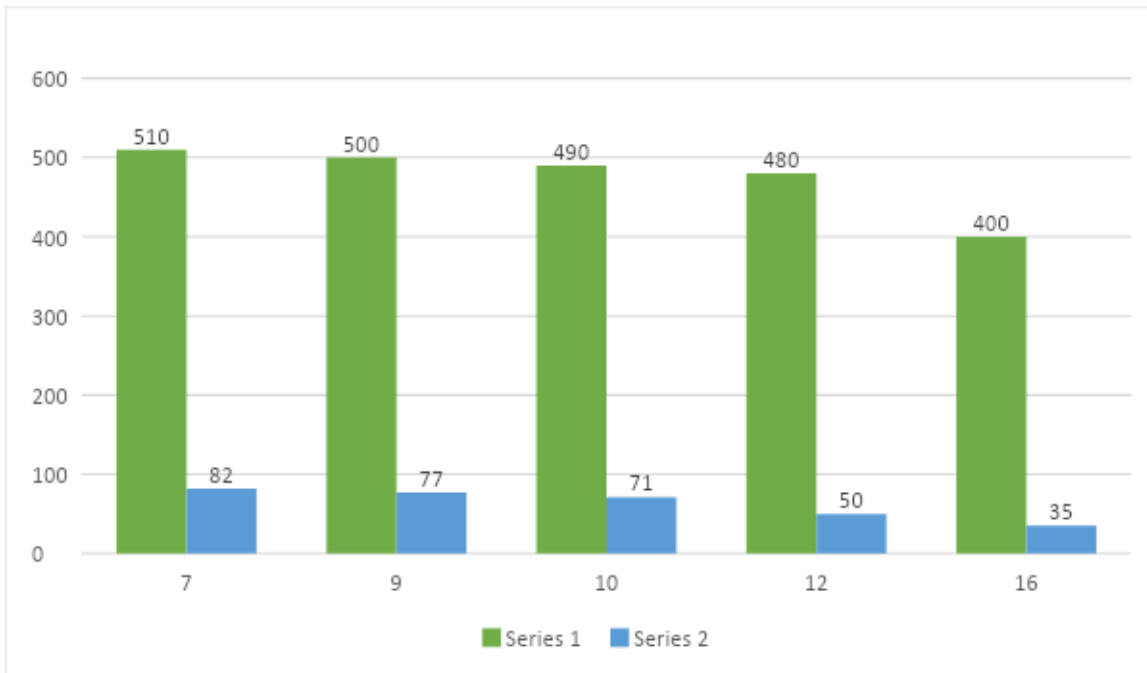


Table no- 02: Information about machine speed and breakage of yarn purchased from different spinning mill:

From this table, we all know some info regarding differing kinds of yarn provider for denim production. we tend to additionally understand differing kinds of yarn and yarn count. Here, we will get some info regarding machine potency betting on yarn provider, yarn varieties and yarn counts. we all know that, machine potency additionally depends on machine speed and yarn breakage. Yarn breakage is that the elementary drawback of warp. therefore if the warp quality is good then the more method are easier. This table provides us the relation between yarn count, Yarn breakage, machine speed and additionally machine quality. This table additionally showed us, if the yarn is coarser then we will simply run machine at high speed and therefore the range of yarn breakage is lower. however if we tend to choose the finer yarn then we tend to cannot run machine as high speed as like coarser yarn. we tend to see within the table yarn open ends and ring roughness yarn from the Sportking spinning company because it count 8, 9 it show high speed ball warp wherever defect per hour only 7-8 times. at that time we tend to see for Square Textiles, there additionally offer open ends and ring slub yarn that count is 7,8 and breakage per hour is 8 – 10,however the machine speed decrease and additionally yarn breakage increase. From this we tend to learn that if the count is nearly same and kind of yarn

same however betting on the standard of yarn and yarn provider machine speed and also yarn breakage will vary. All the info of this table showed those things.

Dyeing quality parameters:

Table no- 03: Various colors and shades of denim fabrics:

SL No.	Shade	Shade Grading	Shade (%)
01	Indigo	Dark	4.5%
		Medium	3.8%
		Light	2.9%
02	Black	Dark	5.2%
		Medium	4.4%
		Light	3.9%
03	Bottoming	Dark	5.2%
		Medium	3.8%
		Light	2.8%
04	Topping	Dark	4.0%
		Medium	3.1%
		Light	2.0%
05	Ash	Dark	Null
		Medium	Null
		Light	Null

This table is giving us the data concerning colouring shade, shade grading, shade %. In this table four kinds of shade is used by us. They're Indigo, Bottoming, Topping, Black. Every shade is grading by dark, medium and lightweight.

- In Indigo the shade is vary between 2.9% to 4.5% (Light to Dark).
- In Black shade is vary between 3.9% to 5.2% (Light to Dark).
- In Bottoming shade is vary between 2.8% to 5.2% (Light to Dark).
- In Topping shade is vary between 2.0% to 4.0% (Light to Dark).

Relation between Squeeze roller pressures, Dancing roller tension, Deeping time, Machine Speed:

No. of Dye Box	Squeeze Roller Pressure (PSI)	Dancing Roller Tension	Deeping Time(Sec)	Machine Speed (Mpm)
01	80	28 – 32	16 – 20	25 – 28
02,03	75	28 – 32	16 – 20	25 – 28
04	70 – 75	28 – 32	16 – 20	25 – 28

05	70	28 – 32	16 – 20	25 – 28
06	75	28 - 32	16 – 20	25 - 28

Table: Relation between Squeeze roller pressures, Dancing roller tension, Deeping time, Machine Speed.

By this table we have a tendency to see rope colouring colouring totally different parameter. In Slasher colouring machine there square measure totally different dyes and chemical boxes square measure gift. during this table we have a tendency to showed 6 dye box and there squeeze roller pressure, deeping time and machine speed. From these four parameters we have a tendency to showed the condition of dye bath. As slasher colouring could be a continuous method thus these parameters ought to be maintained terribly rigorously. Here we have a tendency to see totally different dye boxes pressure, depping time and machine speed. like for first dye box has 80psi squeeze roller pressure, to keep up correct tension of the rope it ought to follow 28-32 tension and for matching correct color shed deeping time should be 16-20 sec. Here whole machine output 25-28. As like different dye boxes square measure followed this parameters consequently.

Some parameter of size and details regarding size sample instruction:

Recipe of sample sizing:

Orchid= 48 kg

Siza bond= 8.5 kg

PCB= 04 kg

Wax= 3.5 kg

E20 = 31 kg (EM-Size)

T20 = 30 kg (EM-Size)

C.M.S = 5kg (Softener)

Water= 740 ltr

Some parameters of sizing:

Name	Actual Parameters	Calculated Parameters
Cooking Time	35 min	35 min
Water	736 Liter	740 Liter
Temperature	80° C	80° C

Table-07: Some parameters of sizing.

This table provides us with information on various sizing and sizing recipe criteria. There is one scouring box in the sizing machine where the temperature ranges between 70° C - 90° C and 35 min, using 740 ltr of water in this recipe. Some sizing parameters such as orchid, siza bond, PCB scale, wax and water are known in this table. There are certain sizing materials that after dyeing are typically used in sizing. To minimize thread breakage, the sizing material is used to give a surface coating

Loom Type	100% Production	P/A-R/A		P/B-R/B		P/C-RC	
		Actual Production	Effi%	Actual Production	Effi%	Actual Production	Effi%
Airjet 38/25	11128 yds	2384yds	67.7%	2397yds	65.3%	2425yds	67.2%
Rapier 38/36	14978 yds	4283yds	82.3%	4283yds	85.6%	4283yds	81.5%
Somet 32/22	4137 yds	982yds	77.6%	1120yds	78.8%	1120yds	79.3%
Total	30243 yds	7649yds	75.86%	15553yds	76.56%	7828yds	76.00%

Both Production=31030 efficiency=76.14%

We saw weaving production in this table. We also know the type of loom, no of loom and daily calculated and actual production by air jet loom, rapier and somet machine. Finally we get a calculated and actual production and also the efficiency of all the machine.

CHAPTER—05
RESULT & DISCUSSION

Result & Discussion:

We also found a portion of the findings that were portrayed in our task paper from those works. The consistency parameter was discovered by the factory and a portion of the investigations were conducted without the involvement of anyone else. The discoveries are discussed beneath.

Analysis Beam Warping Section:

Basically, we know that Yarn is a most important component for Denim fabric weaving. So, the nature of the yarn must be unspoiled to sew a good quality of sewing. From the table we found the variables that can be hamper the good quality of production. So, it will be mandatory to utilize best quality of yarn to have the best quality of fabric.

Analysis Dyeing Section:

slasher dyeing is the most preferable dyeing method by which indigo will penetrate into the fibre easily and it will make the most perfectly dyed yarn with a good quality. We found that it is the fastest process for dyeing yarn.

We also found that in slasher dyeing process shade variation in slasher dyeing is preferably less. It is notify that re- beaming is not needed .

In slasher dyeing process establishment cost is very high on the other hand the purchasers are offer 10 to 15 taka more for the shade and quality of yarn.

Analysis Sizing section:

Viscosity of size glue in size box:

All variation of the concentration and temperature can hamper the concentration and degree of size get and also degree of infiltration. Firstly the visosity expand and the size get additionally increments. So the viscosity increment past a point and the size get percentage is decreased.

Squeezing pressure and condition of squeezing nip:

Squeezing pressure and squeezing neep condition is most important parameter for the degree of size get because high pressure will be affect the size percentage and the good condition of nip is also can maintain the proper absorption of size material.

Speed of the sizing machine:

speed of the sizing machine is another parameter which is affectable for the sizing pickup % by increasing or decreasing degree of size get. High speed can reduce size pickup and lower speed can increase pick up.

Depth of immersion roller in size paste:

The term for which the yarn remains drenched in the paste can be decide by the depth of immersion roller in size paste.

Level of size glue in the size box:

Variation in the level of size glue in the size box is the most responsible parameter for size variation.

Analysis Weaving section:

Weaving is the most important and preferable way for producing fabric. Weaving can make a smooth, less hairiness results by interlacing two sets of yarn or thread. Weaving can make a stable structure which can play a great role for clothing or another use. During weaving we have to know about many types of procedure acting while produce a fabric.

Fault analysis:

Fabric assessing is the most effective procedure to make sure the quality of fabric and finding the way to reduce the faults and make a good efficient production. For studying the shortage we use the 4 point and 10 point system which is most used and effectful way but 4 point is the most preferable for Denim fabric.

CHAPTER- 06
CONCLUSION

Conclusion:

By these experiment we exposed a part of a outcome which is discussed in our task paper. We have learned different parts of denim fabric production during this production. From Table-1 if the count number is increase then the tension and the speed of machine is decreased. From table-2 we also know that the number of breakage is different if the number of count is same but the supplier is not same. From Table-3 we found the different colour shades in fabric. From Table-4and5 we know about the squeeze roller pressure sizing material concentration and depth of the size box and Table-6,7,8,9 we know about the weaving production quality parameter and fault detection way and results and method..

Now a days quality turns into an unexpected issue which is increasing its expectation day by day and the buyers also sensitive about the quality of products. The market is getting tough by raising the expectation level of quality. For survive in the market most of the suppliers are trying to ensure the best quality of products for this reason they have to face a tough condition.

In our country quality is a major issue because most of the industry can not ensure proper quality for this reason still now we can not enter into the revolution of development. So, we have to make policy ensure quality and make the proper required output for satisfying the buyers for make strong relationship between buyers and suppliers.

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