Faculty of Engineering

Department of Textile Engineering

Thesis on

"Studies on the Effect of Pre-Treatments on the Physical Characteristics of Woven (100% Cotton) Fabric."

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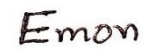
Declaration

We attest that this thesis report is totally our own work, except where we have given fully documented references to the work of others and that the materials contained in this report have not previously been submitted for assessment in any formal course of study. If we do anything, which is going to breach the first declaration, the examiner/supervisor has the right to cancel my report at any point of time.



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LETTER OF APPROVAL

This thesis report prepared by Md. Emon (ID.: 191-23-682) and Debotonu Sen (ID.: 191-23-668) is approved in Partial Fulfillment of the Requirement for the Degree of **BACHELOR OF SCIENCE IN TEXTILE ENGINEERING**. The said students have completed their thesis work entitled **"Studies on the Effect of Pre-treatments on the Physical Characteristics of Woven Fabric "** under my supervision.

During the research period I found them sincere, hardworking and enthusiastic.

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Dedicated To Our Beloved Parents

&

Honorable Teachers.

Abstract

The physical properties of woven fabric play a crucial role in determining the quality of the finished product. One of the most important processes involved in the production of woven fabric is the pretreatment process. The pretreatment process involves several steps that are designed to improve the quality of the fabric and make it suitable for further processing. In this thesis paper, we will examine the changes in physical properties of woven fabric before and after the pretreatment process. The objective of this study is to analyze the changes in physical properties of woven fabric before and after the pretreatment process. The study employed a quantitative research design, with the data being collected through experimental testing. We will examine the different methods of pretreatment, including scouring, bleaching, and mercerization, and their impact on the physical properties of the fabric. These changes in physical properties of woven fabric before and after pretreatment process are important for the textile industry to optimize the pretreatment process and produce high-quality fabric . The aim of this thesis is to provide a comprehensive analysis of the pretreatment process and its effects on the physical properties of woven fabric. For this study we examine EPI, PPI , GSM, Crimp% before and after pre treatment process . This literature review aims to discuss the changes in physical properties such as EPI (ends per inch), PPI (picks per inch), GSM (grams per square meter), and crimp% of woven fabrics before and after pretreatment processes.

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CHAPTER - 1

INTRODUCTION

1. Introduction

The interlacing of strands to create woven fabric is one of the most popular ways to make fabrics. The most adaptable and intricately designed material might be woven fabric. The weave of a cloth can be altered by altering the interlacing pattern . In greige fabric, the warp and weft yarns have natural colors and raw fiber imperfections. In textile wet processing sector, pretreatment is a heart of processing of textile. In pretreatment, all these impurities are removed and fabric is brought to a stage where it is more absorbent and white and can be easily processed further. The process which are applied to make the textile .

All woven fabrics must therefore go through a wet processing step known as singeing and desizing, scouring and bleaching, and mercerizing. Before dying or undergoing any processing, all fabrics must go through these procedures. The effects of these procedures on fabric characteristics are striking. Pretreatment procedures were carried out in a facility dedicated to export-oriented dying, printing, and finishing, and testing was conducted using common types of equipment that complied with ISO criteria. The fabric often experiences variations in its EPI (Ends per Inch), GSM (Gram per Square Meter), width, Ph, absorbency, tensile strength, and rip strength during these procedures. In this topic we have analyze the changed of woven fabric characteristics before & after treatment process . Pre treatment process which includes singeing, desizing, scouring, bleaching, mercerization . After this process woven fabric physical & chemical characteristics are changed.

1.1 Objectives of this Study

- To know about the change of characteristics of woven fabric before & after pretreatment (singeing, desizing, scouring, bleaching, mercerization) process.
- To compare of EPI, PPI, GSM, crimp % changes between before & after pretreatment process .
- To know about the characteristics of different types of cotton fabric like satin slab, voile etc.
- To get idea about how to measure EPI,PPI, GSM, crimp percentage of the fabric.
- To get idea about how a cotton fabric changes its physical properties after pre-treatment

CHAPTER - 2

LITERATURE REVIEW

1.1 Pre –Treatment Process :

The textile industry is one of the most significant and rapidly growing industries in the world. The textile industry plays a vital role in our daily life, and the use of fabric is widespread .Textile manufacturing involves the conversion of fibers into yarn, which is then woven or knitted into fabrics. Woven fabrics are one of the most commonly used textile products, and they are produced by interlacing warp and weft yarns The quality of woven fabrics depends on several factors, including the type of fibers used, the yarn construction, the weaving process, and the finishing processes and the properties of woven fabrics are determined by various factors such as fiber type, yarn count, weave structure, finishing treatments, and pretreatment processes One of the most crucial steps in the textile manufacturing process is the pretreatment of fabrics. The pretreatment process is a crucial step in the fabric production process that can significantly affect the physical properties of woven fabrics . The pretreatment process involves several steps, including desizing, scouring, bleaching, and mercerization. These steps are essential to remove impurities, improve the absorbency and whiteness of the fabric, and enhance the strength and durability of the fabric. The purpose of this paper is to investigate the changes in physical properties of woven fabric before and after the pretreatment process.

Flow Chart Of Pre Treatment :

Grey fabric

↓

Stitching

↓

Singeing

↓

De-sizing

↓

Scouring

↓

Bleaching

↓

Mercerization

Desizing Process : Desizing is the first step in the pretreatment process and involves removing the sizing agents from the yarn. Desizing can cause a reduction in the EPI and PPI of woven fabrics, resulting in a less dense fabric. However, some studies have reported an increase in EPI and PPI after desizing due to the removal of excess sizing agents from the yarn. Desizing has also been found to increase the GSM of the fabric due to the removal of sizing agents and the release of fibers from the yarn.

- **Objective of Desizing Process:**

Desizing is typically done by soaking the fabric in hot water or a desizing solution to dissolve and remove the sizing material. The effectiveness of the desizing process is important for ensuring that the fabric can be successfully dyed or finished without any sizing-related defects.

- Remove starch from the fabric
- To increase the absorbency of the fabric
- To reduce the stiffness & make the fabric soft
- To make fabric ready for the subsequent process

- **Desizing chemicals are given below:**

  - Wetting Agent
  - Sequestering Agent
  - Enzyme

- **Factors that influence de-sizing:**

  - Size removal depends essentially on the following factors:
  - Viscosity of the size in solution.
  - Ease of dissolution of the size film on the fiber
  - Amount of size applied.
  - Fabric construction.
  - Method and nature of washing-off.
  - Temperature of washing-off

Scouring Process : Scouring is the process of removing impurities from the fabric, and it can affect the physical properties of woven fabrics. Scouring has been found to increase the EPI and PPI of woven fabrics due to the removal of impurities that can cause yarn slippage. Scouring can also reduce the GSM of the fabric due to the removal of impurities that can add weight to the fabric. Scouring has little effect on the crimp% of the fabric.

Objectives of scouring :

1. The main purpose of scouring is to remove the impurities from the textile materials.
2. The textile materials are leave in a highly absorptive condition without undergoing any chemical or physical damage significantly.
3. To produce hydrolytic characteristics.
4. To increase absorbency of fabric.
5. To remove natural nitrogenous coloring materials, dirt, dust, husk, broken seed protein,leaf by oxidizing on chemical treatment
6. After scouring process, material becomes suitable for the next process bleaching. bleaching process can be defined as the destruction of natural coloring matters from the textile materials in order to achieve a clean white end product. Different types of bleaching agent are used during bleaching.

Bleaching Process: Bleaching is the process of removing natural and synthetic colorants from the fabric, and it can affect the physical properties of woven fabrics. Bleaching has been found to reduce the EPI and PPI of woven fabrics due to the removal of natural and synthetic colorants that can cause yarn slippage. Bleaching has also been found to reduce the GSM of the fabric due to the removal of natural and synthetic colorants that can add weight to the fabric. Bleaching has little effect on the crimp% of the fabric.

Chemical for scouring & Bleaching process:

1. NaOH
2. Detergent
3. Sequestering Agent
4. Soda Ash
5. H_2O_2
6. H_2O_2 stabilizer

Function of different chemical agent:

NaOH(alkali): To neutralize acidic materials. Swell the fiber & saponify glycerides & to remove the oil, fats, wax & additive impurities form the fabric.

H2O2 : It's a universal bleaching agent. H2O2 is virtually the only bleaching agent available for protein fibers & is extensively used for cellulose fibers .It's function to break the cellulose particles & remove the natural coloring matter & produce permanent whiteness to the fabric.

Stabilizer: Stabilizer effects at various condition of PH ,temperature, liquor ratio & water hardness. It's function to maintain the proper power of H2O2 at high temperature.

Mercerization Process : Mercerization is the final step in the pretreatment process, which involves the treatment of cotton fabric with concentrated sodium hydroxide solution. Mercerization can significantly improve the strength, dyeability, and luster of the fabric. Mercerization can also affect the weight, thickness, and absorbency of the fabric. Studies have shown that mercerization can increase the weight and thickness of the fabric, while improving the strength and elongation.

Objects of mercerization

1. Length wise shrinkage and swelling axially.
2. Untwisting of fiber.
3. Changes of cross section of the fiber due to swelling.
4. Increase tensile strength.
5. Decrease the extension at break.
6. Increase luster.
7. Increase smoothness of fiber.
8. Increase affinity to dyestuffs and chemicals.

Mercerization is done for some several purposes-

· To increase luster

· To increase affinity to dyes

· To control fabric width and for dimensional stability

· To increase tensile strength and save dye.

Function of differant chemical agent:

NaOH: To neutralize acidic materials. Swell the fiber & saponify glycerides & to remove the oil, fats wax & additive Impurities form the fabric.

Mercerize oil: It is a wetting agent. Its function is to remove surface tension of the water& minimize interfacial tension.

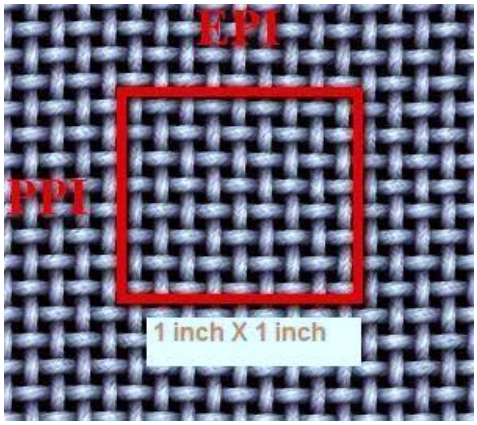
Acetic acid: To maintain proper value of PH

2.2 Physical properties of woven fabric:

Woven fabrics are characterized by various physical properties that determine their quality and performance. EPI and PPI are important parameters that determine the fabric's density and strength. GSM is the weight of the fabric per unit area and is a critical parameter that determines the fabric's stiffness, drape, and handle. Crimp% is the degree of waviness or curvature of yarns in woven fabrics and is an important parameter that determines the fabric's bulkiness and resilience. But we have not opportunity to test like this. Several studies have investigated the effects of pretreatment processes on the physical properties of woven fabrics. In general, pretreatment processes have been found to affect the EPI, PPI, GSM, and crimp% of woven fabrics.

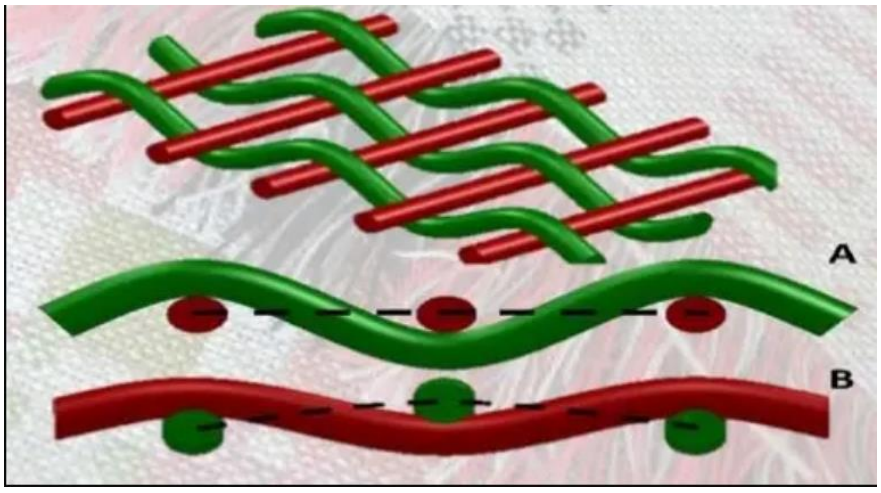
EPI (Ends Per Inch): EPI is a measure of the number of warp yarns per inch in a woven fabric. The pretreatment process can affect EPI by causing shrinkage or expansion of the yarns. For example, Mercerization, which is a commonly used pretreatment process for cotton fabric, can cause the fibers to swell and increase the distance between the yarns, resulting in a decrease in EPI . In contrast, a scouring process, which removes impurities from the fabric, can cause shrinkage of the fibers, resulting in an increase in EPI.

PPI (Picks Per Inch): PPI is a measure of the number of weft yarns per inch in a woven fabric. The pretreatment process can also affect PPI in a similar way as EPI. For instance, a Mercerization process can increase the distance between the weft yarns and result in a decrease in PPI. On the other hand, a bleaching process can cause shrinkage of the weft yarns, leading to an increase in PPI.



GSM (Grams Per Square Meter): GSM is a measure of the weight of the fabric per unit area. Pretreatment processes can affect GSM by removing impurities, sizing, or other materials that may be present on the fabric. For example, a desizing process can remove the sizing material from the fabric, resulting in a decrease in GSM. Similarly, a bleaching process can remove impurities and lighten the fabric, leading to a decrease in GSM.

Crimp%: Crimp% is a measure of the degree of waviness or crimp in the yarns of a fabric. Pretreatment processes can affect Crimp% by altering the shape and structure of the yarns. For instance, a scouring process can cause the yarns to become more rigid, leading to a decrease in Crimp%. On the other hand, a Mercerization process can increase the crimp of the yarns, leading to an increase in Crimp%.



CHAPTER - 3

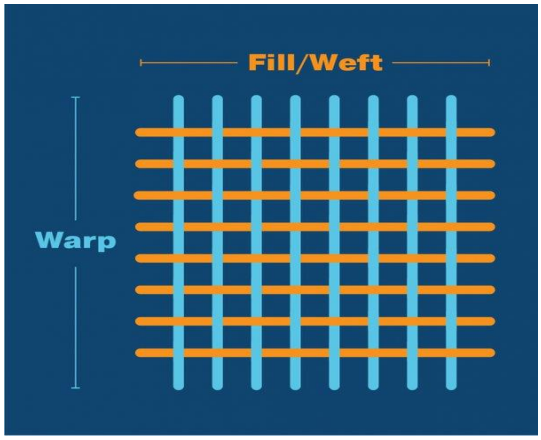
METHODOLOGY /EXPERIMENTAL DETAILS

3.1 Sample collection :

All the sample are collected from bulk section of the production of the pre treatment (singing, desizing, scouring , bleaching , mercerizing) section before and after the process { 100% cotton woven fabric (voile) } .

3.2 EPI & PPI Measurement : EPI means Ends Per Inch. Number of Warp yarn per inch of fabric. Same way we measure PPI . PPI means Picks Per Inch of fabric

EPI and PPI are used to count the quantity of yarns in the fabric's weft and warp directions, respectively. In weaving, the fabric is examined with a Counting glass set to a multiplier to prepare the beam.



Apparatus for EPI & PPI Measurement :

1. Scale
2. Pen
3. Counting Glass
4. Counting needle
5. Collected sample Fabric
6. Scissor

Working procedure:

- At first we Gather fabric samples Gather fabric swatches for which you plan to calculate the EPI and PPI.
- Then Lay a cloth sample on a flat surface and manually press out any creases.
- Identify the direction of the warp and weft by marking arrows.
- Create a one-inch square on the sample.
- On the fabric, draw a 1 X 1 inch square with a pen or pencil.
- Mark lines as closely as possible to the warp and weft directions.
- To determine the average EPI and PPI, take 2 sample . from fabric.
- Then we Count the ends and picks that are contained within those 1 inch sample with a needle and counting glass.

We Measure EPI & PPI for every single sample which we collected from after and before pre treatment process

3.3 Crimp % measurement :

The mean percentage difference between the length of the thread when it is straightened and the space between its ends when it is woven into the fabric is known as crimp.

Two values must be determined from the definition of crimp: the length of the cloth from which the yarns are separated and the length of the thread after it has been straightened.

Apparatus for Crimp% Measurement :

1. Sample fabric
2. Scale
3. Pen
4. Scissor
5. Clip
6. Calculator

Working procedure:

- At first we take fabric for measure the crimp % .
- Then we take the crimp length of the fabric by using scale and clip .
- Now , applying enough tension take the straight length of the fabric by using scale.
- Here we take 20 cm fabric for measurement .
- Then we calculate the Crimp% with calculator.

Calculation of Crimp % :

Warp Crimp% = 100 × [(length of warps in straighten form - warp wise fabric sample length)/Warp wise fabric sample length]

Weft Crimp% = 100 × [(length of weft in straighten form - weft wise fabric sample length)/Weft wise fabric sample length]

In this Experiment We only measure Warp Crimp % ..

We Measure Crimp % for every single sample which we collected from after and before pre treatment process .

3.4 GSM (Gram Per Square Meter) Measurement :

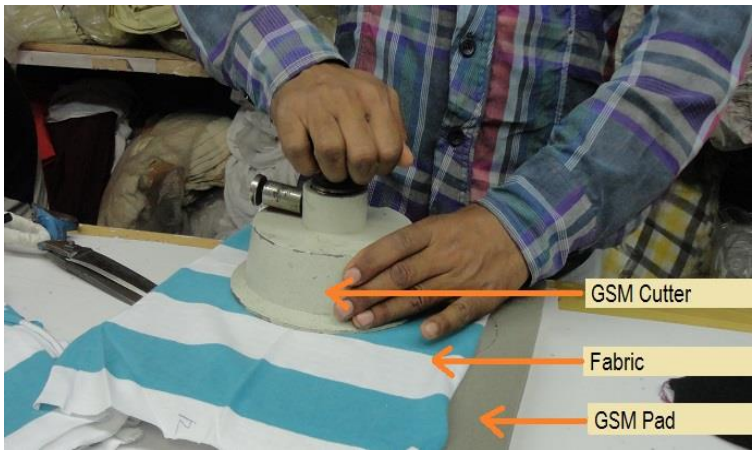
GSM means Gram Per Square Meter that means weight of one square fabric in gram GSM is a crucial factor in defining a certain knitted fabric quality. The weight is used to determine woven and knitted fabric production. Calculating fabric GSM is a physical test .To correctly calculate the GSM (Grams per square meter) of any type of fabric, GSM cutters are utilized. I'll now walk through the process of calculating cloth GSM.

Apparatus for Crimp% Measurement :

1. Sample
2. GSM Cutter
3. Electric Balance
4. Calculator

Working Procedure:

- At first we take a sample for measure GSM.
- Then we utilize the GSM cutter to cut the fabric (gram per square inch).100 sq. cm. make up the cut sample.
- Then by using the electric balance we weigh the fabric.
- Then the cut sample's weight is multiplied by 100.
- The GSM of that particular cloth is the outcome.
- For accuracy testing ,use many samples (for instance, 3 samples), and figure out the average GSM.



CHAPTER – 4

RESULT & DISCUSSION

4.1 Singeing & Desizing Process:

EPI changes % calculation:

Sample	EPI Before process	EPI After process	Changes	Changes %	Average %
1.	105	110	5	4.76	5.07
2.	106	110	4	3.77	
3.	105	112	7	6.67	

In this table, we calculate the EPI change% of a voile fabric . we take 3 sample before and after the singeing & desizing process . Then count the EPI . we can see small changes in EPI after the process. EPI are 5.07% increase after the process.

PPI changes % calculation :

Sample	PPI Before process	PPI After process	Changes	Changes %	Average %
1.	68	68	0	0	0.5
2.	67	68	1	1.49	
3.	68	68	0	0	

In this table, we calculate the PPI change% of a voile fabric . we take 3 sample before and after the singeing & desizing process . Then count the PPI . we can see small changes in PPI after the process. PPI are 0.5 % increase after the process.

GSM changes % calculation:

Sample	GSM Before process	GSM After process	Changes	Changes %	Average %
1.	84	82	-2	-2.38	-2.38
2.	84	82	-2	-2.38	
3.	84	82	-2	-2.38	

In this table, we calculate the GSM change% of a voile fabric . we take 3 sample before and after the singeing & desizing process . Then calculate the GSM . we can see small changes in GSM after the process. GSM are 2.38 % decrease after the process.

Crimp% changes calculation:

Sample	Crimp% Before process	Crimp% After process	Changes	Changes %	Average %
1.	3.85	5.21	1.36	35.32	19.65
2.	3.85	4.76	.91	23.64	
3.	4.3	4.3	0	0	

In this table, we calculate the Crimp% change of a voile fabric . we take 3 sample before and after the singeing & desizing process . Then calculate the crimp %. we can see small changes in crimp% after the process .Crimp % are 19.65% increase after the process.

4.2 Scouring & Bleaching Process:

EPI changes % calculation:

Sample	EPI Before process	EPI After process	Changes	Changes %	Average %
1.	110	111	1	.9	0.69
2.	110	112	2	1.18	
3.	112	112	0	0	

In this table, we calculate the EPI change% of a voile fabric . we take 3 sample before and after the scouring & bleaching process . Then count the EPI . we can see small changes in EPI after the process. EPI are 0.69 % increase after the process.

PPI changes % calculation:

Sample	PPI Before process	PPI After process	Changes	Changes %	Average %
1.	68	66	-2	-2.94	-1.47
2.	68	68	0	0	
3.	68	67	-1	-1.47	

In this table, we calculate the PPI change% of a voile fabric . we take 3 sample before and after the scouring & bleaching process . Then count the PPI . we can see small changes in PPI after the process. PPI are 1.47 % decrease after the process.

GSM changes % calculation :

Sample	GSM Before process	GSM After process	Changes	Changes %	Average %
1.	82	79	-3	-3.66	-2.84
2.	82	80	-2	-2.43	
3.	82	80	-2	-2.43	

In this table, we calculate the GSM change% of a voile fabric . we take 3 sample before and after the scouring & bleaching process . Then calculate the GSM . we can see small changes in GSM after the process. GSM are 2.84 % decrease after the process.

Crimp% changes calculation :

Sample	Crimp% Before process	Crimp% After process	Changes	Changes %	Average %
1.	5.21	6.98	1.77	33.97	43.92
2.	4.76	6.98	2.22	46.63	
3.	4.3	6.54	2.2	51.16	

In this table, we calculate the Crimp% change of a voile fabric . we take 3 sample before and after the scouring & bleaching process . Then calculate the crimp %. we can see small changes in crimp% after the process .Crimp % are 43.92% increase after the process.

4.3 Mercerization Process:

EPI changes % calculation:

Sample	EPI Before process	EPI After process	Changes	Changes %	Average %
1.	111	114	3	2.7	1.79
2.	112	113	1	.89	
3.	112	114	2	1.79	

In this table, we calculate the EPI change% of a voile fabric . we take 3 sample before and after the mercerization process . Then count the EPI . we can see small changes in EPI after the process. EPI are 1.79% increase after the process.

PPI changes % calculation:

Sample	PPI Before process	PPI After process	Changes	Changes %	Average %
1.	66	67	1	1.51	0.51
2.	68	67	-1	-1.47	
3.	67	68	1	1.49	

In this table, we calculate the PPI change% of a voile fabric . we take 3 sample before and after the mercerization process . Then count the PPI . we can see small changes in PPI after the process. PPI are 0.51 % increase after the process.

GSM changes % calculation:

Sample	GSM Before process	GSM After process	Changes	Changes %	Average %
1.	79	98	19	24.05	23.02
2.	80	96	16	20	
3.	80	100	20	25	

In this table, we calculate the GSM change% of a voile fabric . we take 3 sample before and after the mercerization process . Then calculate the GSM . we can see small changes in GSM after the process. GSM are 23.02% increase after the process.

Crimp% changes calculation:

Sample	Crimp% Before process	Crimp% After process	Changes	Changes %	Average %
1.	6.98	7.41	.43	6.16	6.49
2.	6.98	6.98	0	0	
3.	6.54	7.41	.87	13.30	

In this table, we calculate the Crimp% change of a voile fabric . we take 3 sample before and after the mercerization process . Then calculate the crimp %. we can see small changes in crimp% after the process .Crimp % are 6.49 % increase after the process.

4.4 Compare EPI changes in the process:

Process	Change %
Singeing & Desizing Process	5.07
Scouring & Bleaching Process	0.67
Mercerization Process	1.79

In this table , we compare the result of EPI changes by the pre treatment process. We can see that, after Singeing & Desizing process EPI are increase 5.07 %. After Scouring & Bleaching Process EPI increase 0.67 % . And after the Mercerization Process EPI increase 1.79 %. By this table we can say that EPI are continuously increase by the pre treatment process. After completing all pretreatment process total EPI increase 7.53 % . which is less effectible .

4.5 Compare PPI changes in the process:

Process	Change %
Singeing & Desizing Process	0.5
Scouring & Bleaching Process	-1.47
Mercerization Process	0.51

In this table , we compare the result of PPI changes by the pre treatment process. We can see that, after Singeing & Desizing process PPI are increase 0.5 %. After Scouring & Bleaching Process PPI decrease 1.47 % . And after the Mercerization Process PPI increase 0.51 %. By this table we can say that PPI are small decrease by the pre treatment process .Because after completing all pretreatment process total PPI decrease 0.46 % . which is not effectible .

4.6 Compare GSM changes in the process:

Process	Change %
Singeing & Desizing Process	-2.38
Scouring & Bleaching Process	-2.84
Mercerization Process	23.02

In this table , we compare the result of GSM changes by the pre treatment process. We can see that, after Singeing & Desizing process GSM are decrease 2.38 %. After Scouring & Bleaching Process GSM decrease 2.84 % . But after the Mercerization Process GSM increase 23.02 %. Which is really unbelievable . After completing all pretreatment process total GSM increase 17.8 % . That is really Effectible .

4.7 Compare crimp % changes in the process:

Process	Change %
Singeing & Desizing Process	19.65
Scouring & Bleaching Process	43.92
Mercerization Process	6.49

In this table , we compare the result of crimp % changes by the pre treatment process. We can see that, after Singeing & Desizing process crimp % are increase 19.65 %. After Scouring & Bleaching Process crimp % increase 43.92 % . Which is really noticeable . And after the Mercerization Process crimp% increase 6.49 %. By this table we can say that crimp % are continuously increase by the pretreatment process. After completing all pretreatment process total crimp % increase almost 70 %. That is effectible for a fabric .

At last we can say that,

After Singing & Desizing , EPI are 5.07% increase & PPI are 0.5 % increase , Crimp % are 19.65% increase , GSM are 2.38 % decrease .

After Scouring & Bleaching , EPI are 0.69 % increase & PPI are 1.47 % decrease , Crimp % are 43.92% increase , GSM are 2.84 % decrease .

After Mercerizing , EPI are 1.79% increase & PPI also 0.51 % increase , Crimp % are 6.49 % increase , GSM are 23.02% increase .

CHAPTER – 5

CONCLUSION

Conclusion

In conclusion, the pre-treatment of woven 100% cotton fabrics has a significant impact on their physical characteristics. we now understand Pretreatment is an essential process that improves the physical properties of woven fabrics. The type of fabric and the pretreatment process used can significantly affect the physical properties of woven fabrics. The findings of this study can be used to optimize the pretreatment process for different types of woven fabrics. After the observation it is observed that, after pre treatment process fabric can significantly improved ,some properties are decrease . But that is not to much . Through the research conducted in this thesis, it was found that various pre-treatment methods such as scouring, bleaching, and mercerization can improve the fabric's properties such as strength, dye uptake, and dimensional stability.

Scouring was found to be an effective pre-treatment method for removing impurities and enhancing the dye uptake of the fabric. Bleaching, on the other hand, improved the whiteness of the fabric and increased its strength. Mercerization was found to increase the fabric's dimensional stability, strength, and luster.

The results of this study demonstrate the importance of pre-treatment in optimizing the physical characteristics of woven cotton fabrics. These findings can be valuable for textile manufacturers and designers in selecting appropriate pre-treatment methods for producing high-quality cotton fabrics. Future research can expand on this study by investigating the effects of other pre-treatment methods and exploring their impact on other types of fabrics .

References

1. https://textiletutorials.com/different-pretreatment-process-of-textile-materials/
2. http://dspace.daffodilvarsity.edu.bd:8080/handle/123456789/9388
3. https://www.researchgate.net/publication/336924715_Effect_of_Pre--Treatment_on_the_Smoothness_Behaviour_of_Cotton_Fabric.
4. https://www.researchgate.net/publication/310473911_A_Study_on_the_Effects_of_Pre-treatment_in_Dyeing_Properties_of_Cotton_Fabric_and_Impact_on_the_Environment
5. https://www.onlineclothingstudy.com/2014/06/what-is-crimp-in-fabric-and-how-to.html#:~:text=Inside%20the%20fabric%2C%20yarns%20form,fabric%20is%20known%20as%20crimp.
6. https://textiletutorials.com/different-pretreatment-process-of-textile-materials/
7. https://www.onlineclothingstudy.com/2013/07/how-to-find-epi-and-ppi-of-fabric.html

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