Department of Textile Engineering

Faculty of Engineering

Effects of Fabric Composition & Weight on Lab Tests of Garments for Different Wet Washes

Course code: TE4214 Course title: Project (Thesis)

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

Bachelor of Science in Textile Engineering

Advance in Apparel Manufacturing Technology

April, 2019

LETTER OF APPROVAL

April 7, 2019

To

The Head

Department of Textile Engineering

102, Shukrabad, Mirpur Road, Dhaka 1207

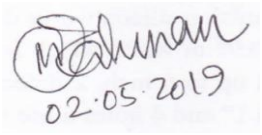
Subject: Approval of Project Report of B.Sc. in TE Program.

Dear Sir,

We are just writing to let you know that this project report titled as Study on Effects of Fabric composition & weight on Lab test of garments for different wet washes have been prepared by Md.Rakibul Hasan, Md. Mahmudul Hasan and Sudeb Ghosh our bearing ID is 151-23-4115, 152-23-4348 and 152-23-4358. It is completed for final evaluation. The whole report is prepared based on the proper investigation and interruption through critical analysis of empirical data with required belongings. The student were directly involved in their project activities and the report become vital to spark of many valuable information for the readers.

Therefore it will highly be appreciated if you kindly accept this project report and consider it for final evaluation.

Yours Sincerely



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Mr. Md. Mominur Rahman

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ACKNOWLEDGEMENT

First of all us we grateful to Allah who gives me sound mind & sound health to accomplish this project successfully.

we also grateful to my supervisor Mr. Md. Mominur Rahman, Assistant Professor, Department of Textile Engineering, Faculty of Engineering, Daffodil international University. His endless patience, scholarly guidance, continual encouragement, energetic supervision, constructive criticism, valuable advice, reading many inferior draft and correcting these at all stages have made it possible to complete this project.

We also thankful to my all teachers, lab assistant, register sir, coordinators and all the employees of Daffodil International University. We are highly delighted to express our regards & gratitude to honorable Head Prof. Dr. Md. Mahbubul Haque for providing his best support to me.

Finally, we would like to express a sense of gratitude to our beloved parents and friends for their mental support, strength and assistance throughout writing the project report.

DECLARATION

We hereby declare that, this project have been done by under the supervision of Mr. Md. Mominur Rahman, Assistant Professor, Department of Textile Engineering, Faculty of Engineering, Daffodil International University. We also declare that, neither this project for any part of this project have been submitted elsewhere for award of any degree or diploma.

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Md.Rakibul Hasan

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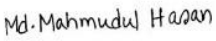

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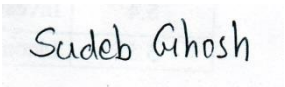

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This is to certify that the above declaration made by the candidate is correct to the best of my knowledge.

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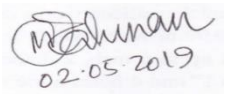

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ABSTRACT

This observation was about the lab test and wash effects of fabric with different fabric composition and fabric weight. This observation make the differences of different fabric wash by which understood the importance of fabric weight and composition for washes. For this reason choose this topic. This observation helps to garments and denim wash for different fabric. Done all experiments individually and personally. This thesis is done to find out the Laboratory Tests of denim garments after denim washing process. This study is done without high facilities. But the output of this study was fine. We have found some laboratory tests data of different fabric and compare among theirs tests.

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CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Denim garments is mostly popular in the world. Day by day its demand is increasing. For this buyers are producing denim garments. For fulfill customers satisfaction buyers are improving denim garments day by day. For this they started denim washing. After denim wash increase the hand feel, softness and etc. In this denim wash we give different shades, produce different style, different color tones and many things. After denim washing have a different physical change, given on the buyer requirement. In garments after sewing denim garments are sending to the wash. In washing they develop the sample by follow the buyer standard (which standard buyers given in R&D section). In this R&D section also take care about the measurement, quality and others requirement. The measurements of the garments are changed due to wash. But we have to make sure that garments quality and measurement have to be equal to the buyer's requirements. After that developing sample sending into the laboratory. There testing the sample by the buyer's requirement. Which done by the physical laboratory testing or chemical laboratory testing or both testing. If this lab test report is matched with the buyer requirement then it's approved for bulk production. Otherwise it is rejected and again developing the sample. That's why this thesis has written to understand the laboratory testing of the denim garments after wash. Some types of analytical data have taken to find out the lab test of denim garments such as tear strength and tensile strength stretch growth and recovery, color fastness to rubbing, color fastness to wash, color fastness to water, color fastness to ozone and etc. By this thesis it will help to understand the different required tests for after wash denim garments of different buyers and also see the deference of the buyer's requirements on the laboratory tests.

1.2 Objectives of the Study

- To analysis about laboratory test after denim wash
- To perform about Physical and chemical laboratory tests
- To perform about Physical laboratory tests equipment's and their working procedure
- To accomplish about chemical laboratory tests equipment's and their working procedure
- To assess about how to analysis the tests report data.

1.3 Significance of the Study

As a fresher textile engineer it is very important to know about the behavior of denim garments after wash and denim garments laboratory tests after wash. This knowledge will support us some times in planning, sometime in production, some time to full fill the buyer requirement. On the other hand now days we have a great opportunity to work under Denim Washing Company. So washing knowledge for denim will be very helpful for our future carrier.

1.4 Limitations of the Study

There are some limitations to complete the study. This experiment was taken from "Denimach Washing LTD of Armana Group".

- Lab space is small
- Only denim garments are washing
- Only one laboratory for washing section.

CHAPTER 2

LITERATURE REVIEW

2.1 Denim Washing

A number of technological factors have contributed to making denim the fashion icon that it is today, including vast improvements in spinning, weaving and finishing. One of the most important parts of creating beautiful denim jeans is washing. Washing has such an important part in the denim chain because of the umpteen effects that consumers look for in their jeans. Denim washing is an aesthetic finish that is imparted to fabric to improve the softness and comfort of the fabric. In addition, the fabric achieves a different look such as a faded or worn-out appearance. It also enhances the appeal and to provide strength. The emphasis is on comfort and softness. Fashion trends favor the broken-in look and worn/faded seams that can only be achieved through garment processing. Much of the appeal of dry denim lies in the fact that with time the fabric will fade in a manner similar to that which artificially distressed denim attempts to replicate. Over the past few decades, different denim washing techniques have been developed and used on different materials to create a large variety of designs for trendy denim garments and jeans. Dry denim, as opposed to washed denim, is a denim fabric that is not washed after being dyed during its production. Much of the appeal of dry denim lies in the fact that with time the fabric will fade in a manner similar to that which artificially distressed denim attempts to replicate. With dry denim, however, such fading is affected by the body of the person who wears the jeans and the activities of their daily life. This creates what many feel to be a more natural, unique look than pre-distressed denim.

Figure 1: Denim washing

2.2 Laboratory tests

Laboratory test after denim wash:

- Fabric weight
- Dimensional Stability to Household Laundering or Dry Cleaning
- Color Fastness to Household Laundering/Washing
- Color Fastness to Rubbing
- Color Fastness to Perspiration
- Color Fastness to Ozone
- Color Fastness to Water
- Tear Strength
- Tensile Strength
- Stretch, Growth & Recovery
- P^H Value

Two types of laboratory tests

1. Physical laboratory tests
2. Chemical laboratory tests

2.2.1 Dimensional Stability to Household Laundering or Dry Cleaning

Dimensional stability is the vital characteristics of a fabric. It is required to confirm about the dimensional stability of a dyed fabric. The measured dimensional stability of a fabric determines whether a fabric has the potential to retain its original shape and remain stable, indicating it will not bubble or sag over time, when applied over a substrate, and its suitability for a specified use. Method: BS EN ISO 3759:1995, BS EN ISO 6330:2001

Purpose: To determine the changes in dimension and appearance of fabrics and garments to specific cleansing procedures.

2.2.2 Color Fastness to Rubbing

A fastness is a place, such as a castle, which is considered safe because it is difficult to reach or easy to defend against attack. This test is designed to determine the degree of color which may be transferred from the surface of a colored fabric to a specify test cloth for rubbing (which could be dry and Wet).

There are two test methods for rubbing fastness.

1. ISO-105-X12

2. AATCC-08

In ISO-105-X12 the wet pickup of the rubbing cloth is 100% .While in AATCC-08 the wet Pickup of the rubbing cloth is 65%.We check rubbing by Dry and Wet methods. In wet rubbing we wet the rubbing cloth according to test method and give rating by comparing the Staining with the gray scale.

Similarly for dry rubbing we check the rubbing with dry rubbing cloth and compare the staining with gray scale for ratings. Color Fastness to rubbing is a main test which is always required for every colored fabric either it is Printed or dyed.

If the color fastness to rubbing is good then it's other properties like washing fastness and durability improves automatically because the rubbing is a method to check the fixation of the color on the fabric. So if the fixation is good it's washing properties will be good.

Rubbing Fastness depends on:

- Nature of the Color
- Depth of the Shade

Construction of the Fabric Nature of the color each color either it is pigment Reactive Disperse or direct has its own fastness properties to rubbing. There are some colors like black, Red, Burgundy, Navy blue which have poor Color fastness properties because of their chemical structure

Like Black color is a carbon base color and the particle size of carbon is large than the other colors that's why its rubbing properties are poor. Similarly red and blue are in the same case. So to improve the color fastness we add more binder to improve the fastness properties of these colors. It doesn't mean that we cannot achieve the best results with these colors. The required results can achieve but production cost will be increase. On the other hand the construction of the fabric also effects the fastness properties.

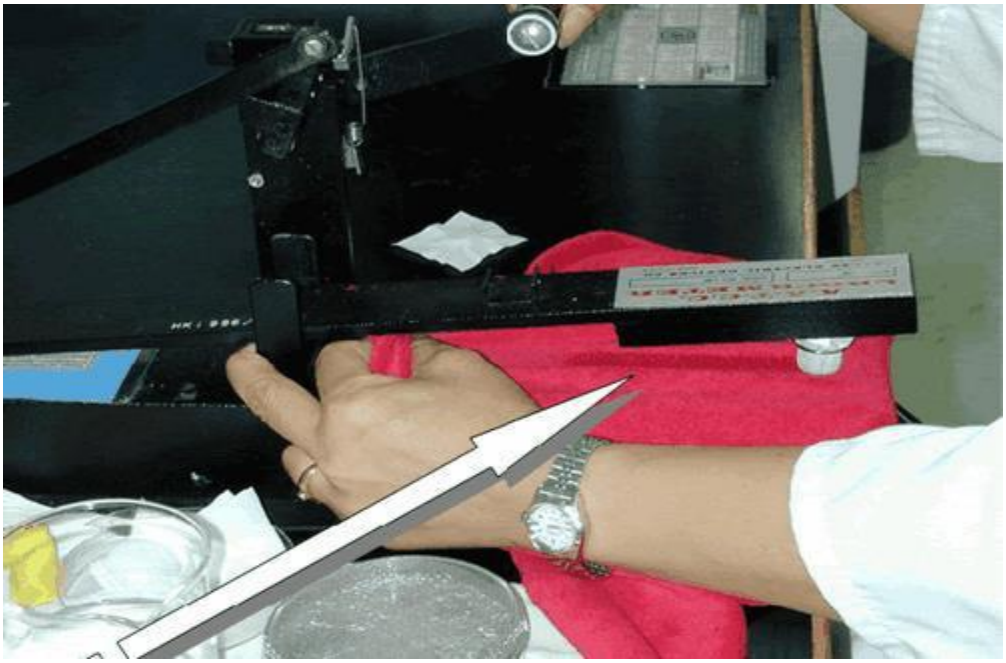


Figure 2: Rubbing fastness test

If the rubbing fastness on 100.80/40.40 is 3 on the gray scale it will be 2-3 on 52.52/22.22 with the same printing parameters. So always keep in mind these effects during finalize the required parameters with your customer.

Always Check

- Quality construction
- Color
- Depth of the Color
- End Use of the product

2.2.3 Tear Strength

Tear strength is a measure of how well a material can with stand the effects of tearing. It is a useful engineering measurement for a wide variety of materials by many different test methods.

Figure 3: Tear Strength m/c

2.2.4 Tensile Strength

Tensile strength is a measurement of the force required to pull something such as rope, wire, or a structural beam to the point where it breaks. The tensile strength of a material is the maximum amount of tensile stress that it can take before failure, for example breaking. There are three typical definitions of tensile strength:

- Yield strength - The stress a material can withstand without permanent deformation. This is not a sharply defined point. Yield strength is the stress which will cause a permanent deformation of 0.2% of the original dimension.
- Ultimate strength - The maximum stress a material can withstand.

- Breaking strength - The stress coordinate on the stress-strain curve at the point of rupture.

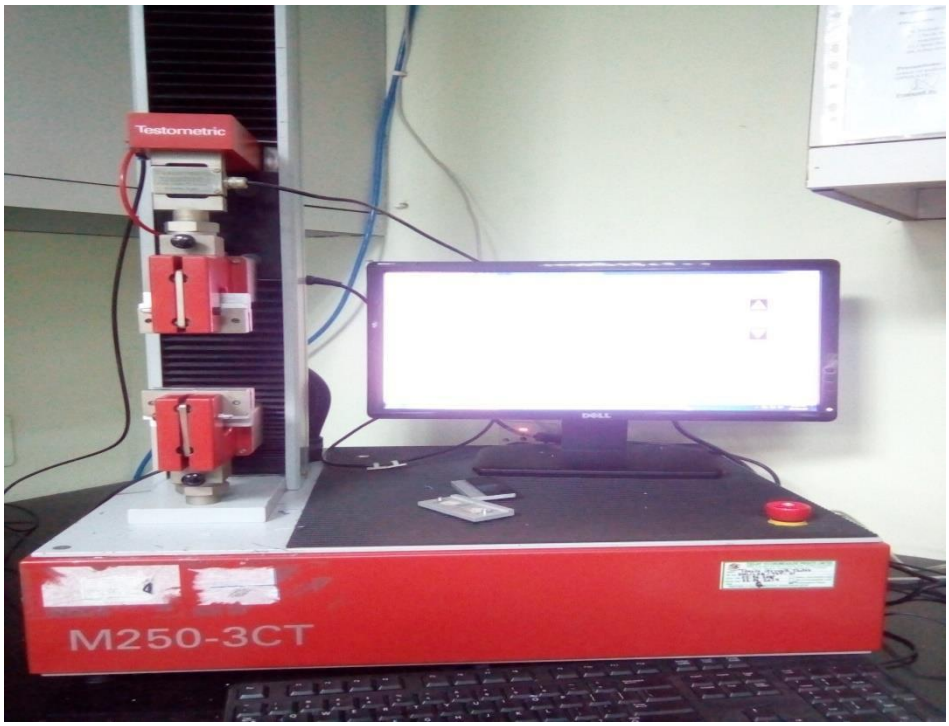


Figure 4: Tensile Strength Tester

CHAPTER 3

EXPERIMENTAL DETAILS

Experiment in many type of washes with different type fabric composition and weight main purpose was observe the changes in shrinkage, tensile strength, tearing strength, rubbing fastness. In this experiments chosen 10 different composition of fabric with variant weight. Washed this fabrics just like: Desizing, Enzyme wash, Stone enzyme wash, Bleach wash, Random Wash, Stone wash, Acid wash, Potash wash, Over dyeing, Tinting, cleaning, Neutralization and many type of dry process. With this process just follow up the changes and different criteria of fabric before wash and after wash. Firstly a piece of fabric tensile strength, shrinkage, rubbing fastness was measured. Then the samples were gone for wash process. Done all experiment in sample section for this reason always used small size washing machine. Water was taken depends on process and fabric. Then washes had done for got the desiring wash effects. After that send it for hydro and dryer for dry the samples. When got the desiring effects then again measured same criteria of the fabric. Keep eye on water pH and temperature which decided the chemical doges in washes.

3.1 Effects of Fabric Composition (98% cotton+2% spandex) and fabric weight 13.4 oz/yd^2 for different wash

Three fabric which composition was 98% cotton + 2%spandex and fabric weight was 13.4oz/yd^2. These fabrics wash experiments and tests are given below in 3.1.1, 3.1.3 and 3.1.5 table.

Table 3.1.1: Different types of wash for a fabric (98% cotton+2% spandex)

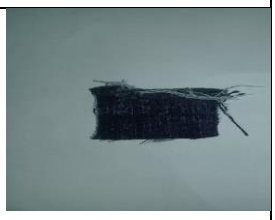
Style Number : 392857						Fabric Name: Arvind-5419		
Step :	**Process**	**Water (L)**	**Temp (*c)**	**PH**	**Time (Min)**	**Chemicals**	**Doges (gm)**	**Picture**
01	Desizing	10	50		20	Soda ash	100	
02	Rinse	10	N/A		1			
03	Enzyme	12	40		20	MR TSK	100 100	
04	Rinse	10	N/A		1			
05	Bleach	15	60		10	KCI Bleach	200	
06	Rinse	10	N/A		1			
07	Neutral	10			2	Hypo	100	
08	Acid Wash	1	40		20	Potash Acid	20 2	
09	Rinse	10	N/A		1			
10	Neutral	5	40		4	Meta	200	
11	Hydro				2			
12	Dryer				30			

Table 3.1.1 shows that what was the visual changes for this washes. In desizing liquor amount was 10L, temp was 50^oc, washing time was 20 min, and soda ash used as desizing agent which amount was 100gm. Cold water rinse for 1min with 10L water. In enzyme wash liquor amount was 10L, temp was 40^oc, washing time was 20 min, MR and TSK used as enzyme which amount was 100+100gm. Cold water rinse for 1min with 10L water. In bleach wash liquor amount was 15L, temp was 60^oc, washing time was 10 min, KCI used as bleach which amount was 200gm. Cold water rinse for 1min with 10L water. In neutralization liquor amount was 10L, no temp for 2 min, hypo used for neutralization which amount was 100gm. In acid wash liquor amount was 1L, temp was 40^oc, washing time was 20 min, potash acid which amount was 20+2gm. Cold water rinse for 1min with 10L water In neutralization liquor amount was 5L, temp was 40^oc, washing time was 4 min, meta used for neutralization which amount was 200gm. Then it was gone for hydro and dryer for 2min and 30min.

Table3.1.2:Comparison of garments (before and after wash)

SL	TEST NAME	RESULT(Before)	RESULT(After)
01	Shrinkage	L:50 cm , W:50	L:48 , W:47
02	Tearing Strength(Warp&Weft)	Warp:18.9lbs	Warp:9.2lbs
		Weft;11.4lbs	Weft:5.00lbs
03	Tensile Strength(Warp&Weft)	Warp:224.5lbs	Warp:165lbs
		Weft:107.6lbs	Weft:54.9lbs
04	Rubbing Dry	4	5
05	Rubbing Wet	1.5	2

Table 3.1.2 shows the comparison of garments before and after wash. This observation gives changes of shrinkage before wash which was L:50, W:50 but after wash it was L: 48, W: 47, Tensile strength before wash was (warp: 224.5lbs and weft: 107.6lbs)**.** Tensile strength after wash was (warp: 165lbs and weft: 54.9lbs)**.** Tearing strength before wash was (warp: 18.9lbs and weft: 11.4lbs)**.** Tearing strength after wash was (warp: 9.2lbs and weft: 5lbs)**.** Rubbing fastness before wash was (for dry 4 and for wet 1.5). Rubbing fastness after wash was (for dry 5 and for wet 2).

Table: 3.1.3: Different types of wash for a fabric (98% cotton+2% spandex)

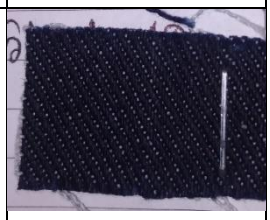
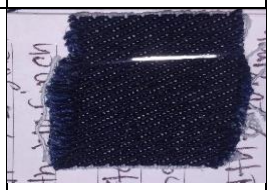
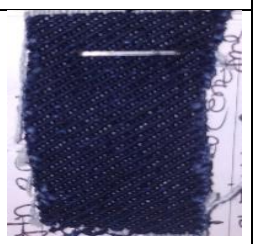
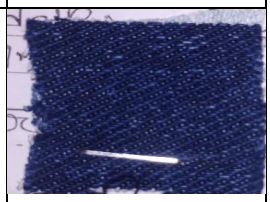
Style Number : 434804						Fabric Name: Woven-4348		
Step:	**Process**	**Water (L)**	**Temp (*c)**	**PH**	**Time (Min)**	**Chemicals**	**Doges**	**Picture**
01	Desizing	15	N/A	5.2	10	Soda + RM	(100 + 50) gm	
02	Rinse	12	N/A	5.2	1			
03	Enzyme	15 + 15			25 +30	Sl + Powder + Bio polish	(100 + 100 + 50)	
04	Rinse	10	N/A	5.2	2			
05	Bleach	13	N/A	5.2	10	Japani Bleach	400gm	
06	Rinse	10	N/A	5.2	1			
07	Neutral	14	N/A	5.2	10	Meta	200gm	
06	Cleaning	14	N/A	5.2	6-7	Caustic+ Peroxide + RM	(150+ 200 + 200)gm	
13	Hydro				2			
14	Dryer				30			

Table 3.1.3 shows that what was the visual changes for this washes. In desizing liquor amount was 15L with 5.2 pH, with no temp washing time was 10 min, soda+RM used as desizing agent which amount was 100+50gm. Cold water rinse for 1min with 12L water and pH was maintained 5.2. In enzyme wash liquor amount was 15+15L with 5.3pH, with no temp washing time was 25+30min, SL+Powder+Biopolish used as enzyme which amount was 100+100+50gm. Cold water rinse for 2min with 10L water and pH was maintained 5.2. In bleach wash liquor amount was 13L, with no temp washing time was 10 min, japani bleach used which amount was 400gm. In neutralization liquor amount was 14L, no temp for 10 min, meta used for neutralization which amount was 100gm. . In cleaning liquor amount was 14L with 5.2 pH, with no temp washing time was 6-7 min, caustic+soda+RM used for cleaning which amount was 150+150+200gm. Then it was gone for hydro and dryer for 2min and 30min.

Table 3.1.4: Comparison of garments (before and after wash)

SL	TEST NAME	RESULT(Before)	RESULT(After)
01	Shrinkage	L:50 cm , W:50	L:47.5 , W:48
02	Tearing Strength(Warp&Weft)	Warp:17.9lbs Weft;12.6lbs	Warp:9.54lbs Weft:5.6lbs
03	Tensile Strength(Warp&Weft)	Warp:214.5lbs Weft:108.6lbs	Warp:165lbs Weft:52.9lbs
04	Rubbing Dry	4.5	5
05	Rubbing Wet	1.5	2

Table 3.1.4 shows the comparison of garments before and after wash. This observation gives changes of shrinkage before wash which was L: 50, W: 50 but after wash it was L: 47, W: 48, Tensile strength before wash was (warp: 214.5lbs and weft: 108.6lbs)**.** Tensile strength after wash was (warp: 165lbs and weft: 52.9lbs)**.** Tearing strength before wash was (warp: 17.9lbs and weft: 12.6lbs)**.** Tearing strength after wash was (warp: 9.54lbs and weft: 5.61lbs)**.** Rubbing fastness before wash was (for dry 4.5 and for wet 1.5). Rubbing fastness after wash was (for dry 5 and for wet 2).

Table: 3.1.5: Different types of wash for a fabric (98% cotton+2% spandex)

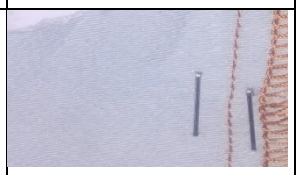
Style Number : 434805						Fabric Name: Knit-4348		
Step:	**Process**	**Water (L)**	**Temp (*c)**	**PH**	**Time (Min)**	**Chemicals**	**Doges**	**Picture**
01	De-sizing	15	N/A	5.4	10	Soda + RM	(100 + 50) gm	
02	Rinse	10	N/A	5.4	1			
03	Towel		N/A		15	Potash+ Phosphoric	(35 + 10) gm	
04	Rinse	10	N/A	5.4	1			
05	Neutral	15	N/A	5.4	30	Meta	350 gm	
06	Clean-ing	15	N/A	5.3	10	Soda	200 gm	
07	Tint	14	N/A	5.3	2	Yellow Color	2 gm	
08	Acid Rinse	15	N/A	5.4	6-7	Acetic Acid	100 ml	
09	Hydro				2			
10	Dryer				30			

Table 3.1.5 shows that what was the visual changes for this washes. In desiszing liquor amount was 15L with 5.4 pH, with no temp washing time was 10 min, soda+RM used as desizing agent which amount was 100+50gm. Cold water rinse for 1min with 10L water and pH was maintained 5.4. In towel wash no liquor was used, with no temp washing time was 15 min, potash+phosphoric used. which amount was 35+10gm. Cold water rinse for 1min with 10L water and pH was maintained 5.4. In neutralization liquor amount was 15L with 5.4 pH, no temp for 30 min, meta used for neutralization which amount was 350gm. In cleaning liquor amount was 15L with 5.3 pH, with no temp washing time was 19min, soda used for cleaning which amount was 200gm. For tinting 2gm yellow color used in 14L liquor 5.3pH for 2min with no temp. Acid rinse for 6-7min with 15L water and pH was maintained 5.4. Acetic acid amount was 100ml. Then it was gone for hydro and dryer for 2min and 30min.

Table3.1.6:Comparison of garments (before and after wash)

SL	TEST NAME	RESULT(Before)	RESULT(After)
01	Shrinkage	L:50 cm , W:50	L:46 , W:45
02	Tensile Strength(Warp&Weft)	Warp:15.9lbs Weft;10.4lbs	Warp:9lbs Weft:4.96lbs
03	Tensile Strength(Warp&Weft)	Warp:220.5lbs Weft:105.6lbs	Warp:162lbs Weft:54.9lbs
04	Rubbing Dry	4	6
05	Rubbing Wet	2.5	3

Table 3.1.6 shows the comparison of garments before and after wash. This observation gives changes of shrinkage before wash which was L:50, W:50 but after wash it was L: 46, W: 45, Tensile strength before wash was (warp: 220.5lbs and weft: 105.6lbs)**.** Tensile strength after wash was (warp: 162lbs and weft: 54.9lbs)**.** Tearing strength before wash was (warp: 15.9lbs and weft: 10.4lbs)**.** Tearing strength after wash was (warp: 9lbs and weft: 4.96lbs)**.** Rubbing fastness before wash was (for dry 4 and for wet 2.5). Rubbing fastness after wash was (for dry 6 and for wet 3).

3.2 Effects of Fabric Composition (90% cotton+10% spandex) for different wash

Three fabric which composition was 90% cotton + 10% spandex. These fabrics wash experiments and tests are given below in 3.3.1, 3.3.3, 3.3.5 table.

For 13 oz/yd^2 fabric weight: for 13oz/yd^2 experiment is given below:

Table 3.2.1 : Different types of wash for a fabric(90% cotton+10% spandex)

Style Number : 381758						Fabric Name: Envoy-1234		
Step:	**Process**	**Water (L)**	**Temp (*c)**	**PH**	**Time (Min)**	**Chemicals**	**Doges (gm)**	**Picture**
01	Desizing	10	50		20	Detarpal Tsk Eco	50 gm	
02	Rinse	10	N/A		1			
03	Enzyme	12	40		10	Bio polish CR Detarpal Tsk Eco	80 gm 50 gm	
04	Rinse	10	N/A		2			
05	Bleach	13	45		3	Sing Clone(Japani)	500 gm	
06	Rinse	10	N/A		1			
07	Neutral	10	40		10	H2O2 Detarpal Tsk Eco	150gm 50gm	
13	Hydro				2			
14	Dryer				30			

Table 3.2.1 shows that what was the visual changes for this washes. In desizing liquor amount was 10L, temp was 50^oc, washing time was 20 min, Detarpal Tsk Eco used as desizing agent which amount was 50gm. Cold water rinse for 1min with 10L water. In enzyme wash liquor amount was 12L, temp was 40^oc, washing time was 10 min, Bio polish CR, Detarpal Tsk, Eco used as enzyme which amount was 80+50gm. Cold water rinse for 2min with 10L water. In bleach wash liquor amount was 13L, temp was 45^oc, washing time was 3 min, sing clone(japani) used as bleach which amount was 500gm. Cold water rinse for 1min with 10L water. In neutralization liquor amount was 10L, temp was 40^0c, H2O2, Detarpal Tsk, Eco used for neutralization which amount was 150+50gm. Then it was gone for hydro and dryer for 2min and 30min.

Table 3.2.2: Comparison of garments (before and after wash)

SL	TEST NAME	RESULT(Before)	RESULT(After)
02	Shrinkage	L:50 cm , W:50	L:48.5 , W:47
03	Tearing Strength(Warp&Weft)	Warp:22.3lbs Weft;12.5lbs	Warp:9.2lbs Weft:5.00lbs
04	Tensile Strength(Warp&Weft)	Warp:203.3lbs Weft:116.3lbs	Warp:172.5lbs Weft:109.0lbs
05	Rubbing Dry	3-4	4-5
06	Rubbing Wet	1-2	2

Table 3.2.2 shows the comparison of garments before and after wash. This observation gives changes of shrinkage before wash which was L:50, W:50 but after wash it was L: 48, W: 47, Tensile strength before wash was (warp: 203.3lbs and weft: 116.3lbs)**.** Tensile strength after wash was (warp: 172.5lbs and weft: 190lbs)**.** Tearing strength before wash was (warp: 22.3lbs and weft: 12.5lbs)**.** Tearing strength after wash was (warp: 9.2lbs and weft: 5lbs)**.** Rubbing fastness before wash was (for dry 3-4 and for wet 1-2). Rubbing fastness after wash was (for dry 4-5 and for wet 2).

For 13.9 oz/yd^2 fabric weight: for 13.9oz/yd^2 experiment is given below:

Table 3.2.3: Different types of wash for a fabric (90% cotton+10% spandex)

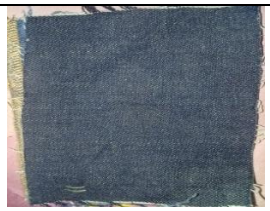
Style Number : 220063						Fabric Name: Arvind-538672		
Step:	**Process**	**Water (L)**	**Temp (*c)**	**PH**	**Time (Min)**	**Chemicals**	**Doges (gm)**	**Picture**
01	Desizing	15	50		15	Caustic Soda Biodi	200gm 15gm	
02	Rinse	10	N/A		1			
03	Enzyme	20	40		30	MR Deterpal EPQ	100gm 50gm	
04	Rinse	10	N/A		1			
05	Bleach	10	40		2-3	Stable Bleaching Powder	200gm	
06	Rinse	10	N/A		1			
07	Neutral	10	50		5	Sodium Metabisulphite	500gm	
08	Tint	7	40		3-4	Yellow 2RL	200ml	
09	Rinse	10	N/A		1			
10	Hydro				2			
11	Dryer				30			

Table 3.2.3 shows that what was the visual changes for this washes. In desizing liquor amount was 15L, temp was 50^oc, washing time was 15 min, Caustic Soda, Biodi used as desizing agent which amount was 200+15gm. Cold water rinse for 1min with 10L water. In enzyme wash liquor amount was 20L, temp was 40^oc, washing time was 30 min, MR, Deterpal EPQ used as enzyme which amount was 100+50gm. Cold water rinse for 1min with 10L water. In bleach wash liquor amount was 10L, temp was 40^oc, washing time

was 2-3 min, Stable Bleaching Powder used as bleach which amount was 200gm. In Neutralization liquor amount was 10L, temp was 50^{o}c, washing time was 5 min, Sodium meta bisulphite used for neutralization which amount was 500gm. In tint liquor amount was 7L, temp was 40^{o}c, washing time was 3-4 min, Yellow 2RL used as tint which amount was 200ml. Cold water rinse for 1min with 10L water. Then it was gone for hydro and dryer for 2min and 30min.

Table 3.2.4: Comparison of garments (before and after wash)

SL	TEST NAME	RESULT(Before)	RESULT(After)
01	Shrinkage	L:50 cm , W:50	L:48 , W:47
02	Tearing Strength(Warp&Weft)	Warp:22.1lbs Weft;13.7lbs	Warp:22.0lbs Weft:10.3lbs
03	Tensile Strength(Warp&Weft)	Warp:217.0lbs Weft:110.8lbs	Warp:210.0lbs Weft:98.9lbs
04	Rubbing Dry	3-4	3
05	Rubbing Wet	1	1

Table 3.2.4 shows the comparison of garments before and after wash. This observation gives changes of shrinkage before wash which was L:50, W:50 but after wash it was L: 48, W: 47, Tensile strength before wash was (warp: 217lbs and weft: 110.8lbs)**.** Tensile strength after wash was (warp: 210lbs and weft: 98.9lbs)**.** Tearing strength before wash was (warp: 22.1lbs and weft: 13.7lbs)**.** Tearing strength after wash was (warp: 22lbs and weft: 10.3lbs)**.** Rubbing fastness before wash was (for dry 3-4 and for wet 1). Rubbing fastness after wash was (for dry 3 and for wet 1).

For 11.7oz/yd^2 fabric weight: for 11.7oz/yd^2 experiment is given below:

Table 3.2.5 : Different types of wash for a fabric (90% cotton+10% spandex)

Style Number : 404771						Fabric Name: Envoy-1234		
Step:	**Process**	**Water (L)**	**Temp (*c)**	**PH**	**Time (Min)**	**Chemicals**	**Doges (gm)**	**Picture**
01	Desizing	10	50		10	Lvacon pap Stone	200 5000	
02	Rinse	10	N/A		1			
03	Enzyme	5	40		15	Nova stone NCL F	200	
04	Rinse	10	N/A		1			
05	Bleach	5	40		2-3	Stable Bleaching Powder	300	
06	Rinse	10	N/A		1			
07	Neutral	5	45		5	H2O2	200	
08	Towal Bleach	7	45		10	Sing Clone Towal QTY	300 100pcs	
09	Rinse	10	N/A		1			
10	Neutral	10	40		5	Lava Con Max	300	
11	Hydro				2			
12	Dryer				30			

Table 3.2.5 shows that what was the visual changes for this washes. In desizing liquor amount was 10L, temp was 50^oc, washing time was 10min, Lvacon pap, Stone used as desizing agent which amount was 200+5000gm. Cold water rinse for 1min with 10L water. In enzyme wash liquor amount was 5L, temp was 40^oc, washing time was 15min, Nova stone NCL F used as enzyme which amount was 200gm. Cold water rinse for 1min with 10L water. In bleach wash liquor amount was 5L, temp was 40^oc, washing time was 2-3 min, Stable Bleaching Powder used as bleach which amount was 300gm. In Neutralization liquor amount was 5L, temp was 45^oc, washing time was 5 min, H2O2 used for neutralization which amount was 200gm. In towel bleach liquor amount was 7L, temp was 45^oc, washing time was 10 min, Sing Clone, Towal used for towal wash which amount was 200gm, 100pcs. Cold water rinse for 1min with 10L water. In Neutralization liquor amount was 10L, temp was 40^oc, washing time was 5 min, Lava con max used for neutralization which amount was 300gm. Then it was gone for hydro and dryer for 2min and 30min.

Table 3.2.6: Comparison of garments (before and after wash)

SL	TEST NAME	RESULT(Before)	RESULT(After)
01	Shrinkage	L:50 cm , W:50	L:48.2 , W:49
02	Tearing Strength(Warp&Weft)	Warp:25.5lbs Weft;12.5lbs	Warp:6.8lbs Weft:4.6lbs
03	Tensile Strength(Warp&Weft)	Warp:201.5lbs Weft:115.3lbs	Warp:105.0lbs Weft:65.6lbs
04	Rubbing Dry	4	4-5
05	Rubbing Wet	1-2	4

Table 3.2.6 shows the comparison of garments before and after wash. This observation gives changes of shrinkage before wash which was L:50, W:50 but after wash it was L: 48, W: 47, Tensile strength before wash was (warp: 217lbs and weft: 110.8lbs)**.** Tensile strength after wash was (warp: 210lbs and weft: 98.9lbs)**.** Tearing strength before wash was (warp: 22.1lbs and weft: 13.7lbs)**.** Tearing strength after wash was (warp: 22lbs and weft: 10.3lbs)**.** Rubbing fastness before wash was (for dry 3-4 and for wet 1). Rubbing fastness after wash was (for dry 3 and for wet 1).

3.3 Effects of Fabric Composition (100% Polyester) for different wash

Three fabric which composition was 100% Polyester. These fabrics wash experiments and tests are given below in 3.4.1, 3.4.2 table.

For 13.5 oz/yd^2 fabric weight: for 13.5oz/yd^2 experiment is given below:

Table 3.3.1: Different types of wash for a fabric(100% Polyester)

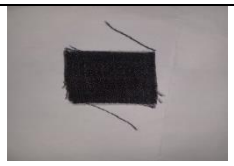
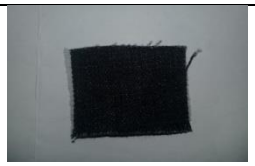
Style Number : 434697						Fabric Name: Arvind-538672		
Step :	**Process**	**Water (L)**	**Temp (*c)**	**PH**	**Time (Min)**	**Chemicals**	**Doges (gm)**	**Picture**
01	Desizing	10L	50		10min	Soda Ash TSK	100 100	
02	Rinse	10	N/A		1			
03	Enzyme	5L	40		8	MR TSK	200 150	
04	Rinse	10	N/A		1			
05	Bleach	15L	50		5	Soda Hydrogen Per Oxide Caustic TSK	100 150 100 150	
06	Rinse	10	N/A		1			
07	Neutral	15L	45		5	TSK G-SOLT	150 100	
08	PP					LOCAL		
09	PP Neutral	10	40		5	Meta	200	
10	Tint	15L	40		5	Blue.K2R T.Blue G.Solt	500ml 200ml 200	
11	Hydro				2			
12	Dryer				30			

Table 3.3.1 shows that what was the visual changes for this washes. In desizing liquor amount was 10L, temp was 50^oc, washing time was 10min, Soda Ash, TSK used as desizing agent which amount was 100+100gm. Cold water rinse for 1min with 10L water. In enzyme wash liquor amount was 5L, temp was 40^oc, washing time was 8 min, MR, TSK used as enzyme which amount was 200+150gm. Cold water rinse for 1min with 10L water. In bleach wash liquor amount was 15L, temp was 50^oc, washing time was 5 min, Soda, Hydrogen Per Oxide, Caustic, TSK used as bleach which amount was 100+150+100+150gm. Cold water rinse for 1min with 10L water. In Neutralization liquor amount was 15L, temp was 45^oc, washing time was 5 min, TSK, G-SOLT used for neutralization which amount was 150+100gm. Then it is gone for PP. In Neutralization liquor amount was 10L, temp was 40^oc, washing time was 5 min, meta used for neutralization which amount was 200gm. In tint liquor amount was 15L, temp was 40^oc, and washing time was 5 min, Blue.K2R, T.Blue, G.Solt used as tint which amount was 500+200ml + 200 gm. Then it was gone for hydro and dryer for 2min and 30min.

Table 3.3.2: Comparison of garments (before and after wash)

SL	TEST NAME	RESULT(Before)	RESULT(After)
01	Shrinkage	L:50 cm , W:50	L:46 , W:44
02	Tearing Strength(Warp&Weft)	Warp:18.1lbs Weft;9.9lbs	Warp:12.8 lbs Weft:10.9 lbs
03	Tensile Strength(Warp&Weft)	Warp:126.7lbs Weft:112.8 lbs	Warp:214.3lbs Weft:101.9lbs
04	Rubbing Dry	4	4.5
05	Rubbing Wet	1-2	2

Table 3.3.2 shows the comparison of garments before and after wash. This observation gives changes of shrinkage before wash which was L:50, W:50 but after wash it was L: 46, W: 44, Tensile strength before wash was (warp: 126.7lbs and weft: 112.8lbs)**.** Tensile strength after wash was (warp: 214.3lbs and weft: 101.9lbs)**.** Tearing strength before wash was (warp: 18.1lbs and weft: 9.9lbs)**.** Tearing strength after wash was (warp: 12.8lbs and weft: 10.9lbs)**.** Rubbing fastness before wash was (for dry 4 and for wet 1-2). Rubbing fastness after wash was (for dry 1-2 and for wet 2).

For 180 GSM fabric weight: for 180 GSM experiment is given below:

Table 3.3.3: **Different types of wash for a fabric(100% Polyester)**

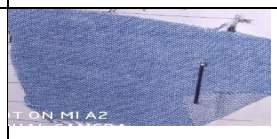
Style Number : 434802						Fabric Name: Twill-4348		
Step:	**Process**	**Water (L)**	**Temp (*c)**	**PH**	**Time (Min)**	**Chemicals**	**Doges (gm)**	**Picture**
01	Desizing	15 Littre	N/A	5.5	10	Soda	100	
02	Rinse	10 Littre	N/A	5.5	1			
03	Enzyme	15 Littre	N/A	5.5	25	Sl + LD	(100 + 100)	
04	Rinse	10 Littre	N/A	5.5	1			
05	Potash	15 Littre	N/A	5.5	10	50 gm Potash	2 mog	
06	Rinse	10 Littre	N/A	5.5	1			
07	Neutral	13 Littre	N/A	5.5	6-7	Meta	100	
06	Cleaning/ for more light	15 Littre	N/A	5.5	5	Soda + Peroxide	(100 + 100)	
07	Hydro				2			
08	Dryer				30			

Table 3.3.3 shows that what was the visual changes for this washes. In desizing liquor amount was 15L with 5.5 pH, with no temp washing time was 10 min, soda used as desizing agent which amount was 100gm. Cold water rinse for 1min with 10L water and pH was maintained 5.5. In enzyme wash liquor amount was 15l with 5.5 pH, with no temp washing time was 25 min, SL+LD used as enzyme which amount was 100+100gm. Cold water rinse for 1min with 10L water and pH was maintained 5.5. In potash wash liquor amount was 15L with 5.5 pH, with no temp washing time was 10 min, 50gm potash used for potash wash which amount was 2mog. Cold water rinse for 1min with 10L water and pH was maintained 5.5. In cleaning liquor amount was 15L with 5.5 pH, with no temp washing time was 5 min, soda+peroxide used for cleaning which amount was 100+100gm. In neutralization liquor amount was 13L with 5.5 pH, no temp for 6-7 min, meta used for neutralization which amount was 100gm Then it was gone for hydro and dryer for 2min and 30min.

Table 3.3.4: Comparison of garments (before and after wash)

SL	TEST NAME	RESULT(Before)	RESULT(After)
01	Shrinkage	L:50 cm , W:50	L:47 , W:45.5
02	Tearing Strength(Warp&Weft)	Warp:19.9lbs Weft;11.5lbs	Warp:9.4lbs Weft:5.05lbs
03	Tensile Strength(Warp&Weft)	Warp:225.5lbs Weft:108.6lbs	Warp:167lbs Weft:55.9lbs
04	Rubbing Dry	4.5	6
05	Rubbing Wet	2.5	2.5

Table 3.3.4 shows the comparison of garments before and after wash. This observation gives changes of shrinkage before wash which was L:50, W:50 but after wash it was L: 48, W: 47, Tensile strength before wash was (warp: 217lbs and weft: 110.8lbs)**.** Tensile strength after wash was (warp: 210lbs and weft: 98.9lbs)**.** Tearing strength before wash was (warp: 22.1lbs and weft: 13.7lbs)**.** Tearing strength after wash was (warp: 22lbs and weft: 10.3lbs)**.** Rubbing fastness before wash was (for dry 3-4 and for wet 1). Rubbing fastness after wash was (for dry 3 and for wet 1).

3.4 Effects of Fabric Composition (80% cotton+20% polyester) and fabric weight 10 oz/yd^2 for different wash

Three fabric which composition was 80% cotton + 20% polyester and fabric weight was 10oz/yd^2. These fabrics wash experiments and tests are given below in 3.5.1and 3.5.2 table.

Table 3.4.1: different types of wash for a fabric (80% cotton+20% polyester)

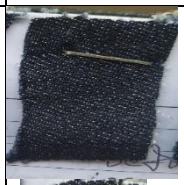
Style Number : 434801						Fabric Name: woven-4348		
Step:	**Process**	**Water (L)**	**Temp (*c)**	**PH**	**Time (Min)**	**Chemicals**	**Doges (gm)**	**Picture**
01	De-sizing	15 Littre	N/A	5.5	10	Caustic Soda	100	
02	Acid Rinse	10 Littre	N/A	5.5	2	Acetic Acid	20 ml	
03	Enzyme + Stone Enzyme	15 Littre 15 Littre	N/A N/A	5.5 5	30 35	Powder Enzyme Stone 1.5kg + SL + Biopolish	200 (100 + 50)	 
04	Rinse	10 Littre	N/A	5.5	1			
05	Potash	15 Littre	40-50 c	5	10	20 gm Potash	½ mog	
06	Rinse	10 Littre	N/A	6	2			
07	Neutral	15 Littre	40-50 c	5.5	6-7	Meta	100	
06	Rinse	10 littre	N/A	5.5	1			
07	Hydro				2			
08	Dryer				30			

Table 3.4.1 shows that what was the visual changes for this washes. In desizing liquor amount was 15L with 5.5 pH, with no temp washing time was 10 min, Caustic soda used as desizing agent which amount was 100gm. Acid water rinse for 2 min with 10L water and pH was maintained 5.5. Acetic acid used for acid

rinse 20ml. In enzyme wash liquor amount was 15l with 5.5 pH, with no temp washing time was 30 min, Powder used as enzyme which amount was 200gm. In stone enzyme wash liquor amount was 15l with 5 pH, with no temp washing time was 35 min, SL+ Biopolish used as enzyme which amount was 100+50gm. 1.5kg stone used for stone enzyme wash. Cold water rinse for 1min with 10L water and pH was maintained 5.5. In potash wash liquor amount was 15L with 5 pH, temp was $(40\text{-}50)^0c$ and washing time was 10 min, 20gm potash used for potash wash which amount was 1/2mog. Cold water rinse for 2 min with 10L water and pH was maintained 6. In neutralization liquor amount was 15L with 5.5 pH, with $(40\text{-}50)^0c$ temp washing time was 6-7 min, meta used for neutralization which amount was 100gm. Cold water rinse for 1min with 10L water and pH was maintained 5.5. Then it was gone for hydro and dryer for 2 min and 30 min.

Table 3.4.2: Comparison of garments (before and after wash)

SL	TEST NAME	RESULT(Before)	RESULT(After)
01	Shrinkage	L:50 cm , W:50	L:48 , W:48
02	Tearing Strength(Warp&Weft)	Warp:192lbs Weft;124.5lbs	Warp:10.5lbs Weft:6.05lbs
03	Tensile Strength(Warp&Weft)	Warp:227.5lbs Weft:108.6lbs	Warp:168lbs Weft:56lbs
04	Rubbing Dry	5	5
05	Rubbing Wet	2	1.5

Table 3.4.2 shows the comparison of garments before and after wash. This observation gives changes of shrinkage before wash which was L:50, W:50 but after wash it was L: 48, W: 48, Tensile strength before wash was (warp: 227.5lbs and weft: 108.6lbs)**.** Tensile strength after wash was (warp: 168lbs and weft: 56lbs)**.** Tearing strength before wash was (warp: 192lbs and weft: 124lbs)**.** Tearing strength after wash was (warp: 10.5lbs and weft: 6.05lbs)**.** Rubbing fastness before wash was (for dry 5 and for wet 2). Rubbing fastness after wash was (for dry 5 and for wet 1.5).

3.5 Effects of Fabric Composition (80% cotton+20% spandex) and fabric weight 13 oz/yd^2 for different wash

Three fabric which composition was 80% cotton + 20% polyester and fabric weight was 10oz/yd^2. These fabrics wash experiments and tests are given below in 3.6.1, 3.6.2 table

Table 3.5.1: Different types of wash for a fabric(80% cotton+20% spandex)

Style Number : 434803						Fabric Name: Knit-4348		
Step:	**Process**	**Water (L)**	**Temp (*c)**	**PH**	**Time (Min)**	**Chemicals**	**Doges(gm)**	**Picture**
01	Desizing	15	N/A	5	7-8	Caustic Soda	100	
02	Acid	10	N/A	5	1			
03	Enzyme	16	N/A	5	20	Ld + Biopolish	(100 + 50)	
04	Rinse	10	N/A	5	1			
05	Acid Wash				6-7	Ball + Potash	(10-12)	
06	Rinse	10	N/A	5	1			
07	Neutral	12	N/A	5	5	Meta	(50-60)	
08	Cleaning	13	N/A	5	10	Soda + Caustic	(200+100)	
09	Acid rinse	14	N/A	5	2	Acetic Acid	30 ml	
10	Hydro				2			
11	Dryer				30			

Table 3.5.1 shows that what was the visual changes for this washes. In desizing liquor amount was 15L with 5 pH, with no temp washing time was 7-8 min, Caustic soda used as desizing agent which amount was 100gm. Cold water rinse for 1min with 10L water and pH was maintained 5. In enzyme wash liquor amount was 16L with 5 pH, with no temp washing time was 20 min, LD+Biopolish used as enzyme which amount was 100+50gm. Cold water rinse for 1min with 10L water and pH was maintained 5. In acid wash no liquor was used, with no temp washing time was 6-7 min, Ball+potash used for acid wash in which potash amount was (10-12)gm. Cold water rinse for 1min with 10L water and pH was maintained 5. In neutralization liquor

amount was 12L with 5 pH, no temp for 5 min, meta used for neutralization which amount was (50-60)gm. In cleaning liquor amount was 13L with 5 pH, with no temp washing time was 10 min, soda+caustic used for cleaning which amount was 200+100)gm. Acid water rinse for 2 min with 14L water and pH was maintained 5. Acetic acid used for acid rinse 30ml. Then it was gone for hydro and dryer for 2 min and 30 min.

Table 3.5.2: Comparison of garments (before and after wash)

SL	TEST NAME	RESULT(Before)	RESULT(After)
01	Shrinkage	L:50 cm , W:50	L:45.5 , W:47
02	Tearing Strength(Warp&Weft)	Warp:19.6lbs Weft:12.5lbs	Warp:9.2lbs Weft:6.00lbs
03	Tensile Strength(Warp&Weft)	Warp:225.5lbs Weft:107.6lbs	Warp:166lbs Weft:55.5lbs
04	Rubbing Dry	4.5	6
05	Rubbing Wet	2.5	3

Table 3.5.2 shows the comparison of garments before and after wash. This observation gives changes of shrinkage before wash which was L:50, W:50 but after wash it was L: 45, W: 47, Tensile strength before wash was (warp: 225.5lbs and weft: 107.6lbs)**.** Tensile strength after wash was (warp: 166lbs and weft: 55.5lbs)**.** Tearing strength before wash was (warp: 19.6lbs and weft: 12.5lbs)**.** Tearing strength after wash was (warp: 9.2lbs and weft: 6lbs)**.** Rubbing fastness before wash was (for dry 4.5 and for wet 2.5). Rubbing fastness after wash was (for dry 6 and for wet 3).

CHAPTER 4

DISCUSSION OF RESULTS

4.1 Comparison between before and after wash (Fabric Composition (98% cotton+2% spandex and fabric weight 13.4 oz/yd^2)

Table 4.1.1: Comparison different types of effect for different types of fabric

Style Name / Test Name	392857	434804	434805
Shrinkage(before wash)	L:50, W:50	L:50 cm , W:50	L:50 cm , W:50
Shrinkage(after wash)	L:48, W:47	L:47.5 , W:48	L:46 , W:45
Tearing Strength(before wash)	Warp: 18.9lbs Weft: 11.4lbs	Warp: 17.9lbs Weft: 12.6lbs	Warp: 15.9lbs Weft: 10.4lbs
Tearing Strength(after wash)	Warp: 9.2lbs Weft: 5.00lbs	Warp: 9.54lbs Weft: 5.6lbs	Warp: 9lbs Weft: 4.96lbs
Tensile Strength(before wash)	Warp: 224.5lbs Weft: 107.6lbs	Warp:214.5lbs Weft:108.6lbs	Warp: 220.5lbs Weft: 105.6lbs
Tensile Strength(after wash)	Warp: 165lbs Weft: 54.9lbs	Warp:165lbs Weft:52.9lbs	Warp: 162lbs Weft: 54.9lbs
Rubbing Dry (before wash)	4	4.5	4
Rubbing Dry (after wash)	5	5	6
Rubbing Wet (before wash)	1.5	1.5	2.5
Rubbing Wet (after wash)	2	2	3

Table 4.1.1 Shows that 392857, 434804, 434805 this samples were same fabric composition and same fabric weight. But after wash this fabrics properties had been changed for their different type of wash. Found that shrinkage varies on different type wash in same type of fabrics. Found that fabric length and width, tearing strength, tensile strength decreased because of heavy wash just like towel wash. But also observed that rubbing fastness dry and wet was increase because of towel wash. Wash effects and test results of remaining two sample were almost same where used bleach and acid two different process. But 434805 this sample wash effects and test results varies too much from other sample. Not maintained any lacra protector that should be a good reason for 434805.

4.2 Comparison between before and after wash Fabric Composition (90% cotton+10% spandex and fabric weight 13 oz/yd^2, 13.9 oz/ yd^2, 11.7oz/yd^2)

Table 4.2.1: Comparison different types of effect for different types of fabric

Style Name / Test Name	381758(13 oz/yd^2)	220063(13.9 oz/yd^2)	404771(11.7oz/yd^2)
Shrinkage(before wash)	L:50, W:50	L:50 cm , W:50	L:50 cm , W:50
Shrinkage(after wash)	L:48.5, W:47	L:48, W:47	L:48.2 , W:49
Tearing Strength(before wash)	Warp: 22.3lbs Weft: 12.5lbs	Warp: 22.1lbs Weft: 13.7lbs	Warp: 25.5lbs Weft: 12.5lbs
Tearing Strength(after wash)	Warp: 9.2lbs Weft: 5.00lbs	Warp: 22lbs Weft: 10.3lbs	Warp: 6.8lbs Weft: 4.6lbs
Tensile Strength(before wash)	Warp: 203.3lbs Weft: 116.3lbs	Warp:217.0lbs Weft:110.8lbs	Warp: 201.5lbs Weft: 115.3lbs
Tensile Strength(after wash)	Warp: 172.5lbs Weft: 109.0lbs	Warp: 210bs Weft: 98.9lbs	Warp: 105lbs Weft: 65.6lbs
Rubbing Dry (before wash)	3-4	3-4	4
Rubbing Dry (after wash)	4-5	3	4-5
Rubbing Wet (before wash)	1-2	1	1-2
Rubbing Wet (after wash)	2	1	4

Table 4.2.1 shows that 381758, 220063, 404771 this samples were three difference weight but same composition. Observe that, samples had simple difference between shrinkage, tearing strength, tensile strength, rubbing fastness. But in these criteria tearing strength and tensile strength most varies to each other for two following two samples 381758, 404771. Rubbing fastness (wet) took the attention for following sample 404771. Its reason was more washes in this sample from other samples. Found that 381758, 381758 this two fabrics weight is less than second one. It was also a good reason for all result variation between same fabric compositions. Not maintained any lacra protector that should be a good reason for their differences.

4.3 Comparison between before and after wash Fabric Composition (100% Polyester and fabric weight 13.5 oz/yd^2, 180 GSM)

Table 4.3.1: Comparison different types of effect for different types of fabric

Style Name / Test Name	434697(13.5 oz/yd^2)	434802(180 GSM)
Shrinkage(before wash)	L:50, W:50	L:50 cm , W:50
Shrinkage(after wash)	L:46 , W:44	L:47, W:45.5
Tearing Strength(before wash)	Warp:18.1lbs Weft;9.9lbs	Warp: 19.9lbs Weft: 11.5lbs
Tearing Strength(after wash)	Warp:12.8 lbs Weft:10.9 lbs	Warp: 9.4lbs Weft: 5.05lbs
Tensile Strength(before wash)	Warp:126.7lbs Weft:112.8 lbs	Warp: 225.5lbs Weft: 108.6lbs
Tensile Strength(after wash)	Warp:214.3lbs Weft:101.9lbs	Warp: 167lbs Weft: 55.9lbs
Rubbing Dry (before wash)	4	4.5
Rubbing Dry (after wash)	4.5	6
Rubbing Wet (before wash)	1-2	2.5
Rubbing Wet (after wash)	2	2.5

Table 4.3.1 shows that 434697, 434802 this samples were two difference weight but same composition. For polyester denim fabric (434697) shrinkage was more than twill fabric(434802). But denim fabric(434697) tearing strength was more than twill fabric(434802). Also found that denim fabric(434697) tensile strength increased after wash but twill fabric(434802) tensile strength decreased after wash. Rubbing fastness for two fabric was almost same. Observed that changes were occurred because of their fabric structure and type.

4.4 Comparison between before and after wash Fabric Composition (80% cotton+20% polyester and fabric weight 10 oz/yd^2)

Table 4.4.1: Comparison different types of effect for different types of fabric

Style Name / Test Name	434801
Shrinkage(before wash)	L:50, W:50
Shrinkage(after wash)	L:48 , W:48
Tearing Strength (before wash)	Warp:192lbs Weft:124.5lbs
Tearing Strength (after wash)	Warp:10.5lbs Weft:6.05lbs
Tensile Strength (before wash)	Warp:227.5lbs Weft:108.6lbs
Tensile Strength(after wash)	Warp:168lbs Weft:56lbs
Rubbing Dry (before wash)	5
Rubbing Dry (after wash)	5
Rubbing Wet (before wash)	2
Rubbing Wet (after wash)	1.5

Table 4.4.1 shows that 434801 this sample had not much change in shrinkage. But this fabric had hedge change in tearing strength. Tensile strength had small change. Rubbing fastness was almost same. Found that tearing strength had hedge change because of stone wash in this composition.

4.5 Comparison between before and after wash Fabric Composition (80% cotton+20% spandex and fabric weight 13 oz/yd^2)

Table 4.5.1: Comparison different types of effect for different types of fabric

Style Name / Test Name	434803
Shrinkage(before wash)	L:50, W:50
Shrinkage(after wash)	L:45.5, W:47
Tearing Strength (before wash)	Warp:19.6lbs Weft:12.5lbs
Tearing Strength (after wash)	Warp:9.2lbs Weft:6.00lbs
Tensile Strength (before wash)	Warp:225.5lbs Weft:107.6lbs
Tensile Strength(after wash)	Warp:166lbs Weft:55.5lbs
Rubbing Dry (before wash)	4.5
Rubbing Dry (after wash)	6
Rubbing Wet (before wash)	2.5
Rubbing Wet (after wash)	3

Table 4.5.1 shows that 434803 this sample had good changes in shrinkage, tearing strength, tensile strength. All this measurement decreased. Rubbing not changed too much. Found that acid wash was main reason for change of these criteria.

CHAPTER 5

CONCLUSION

Conclusion:

Washed Denim garments quality mainly depends on the Laboratory Tests. This report showed some analytical data for Dimensional Stability To, Shrinkage, Tear and Tensile Strength, Rubbing dry and wet of after washing denim garments. Finally the paper is concluded as:

• Shrinkage (4%) varies on different type wash in same type of fabrics. Rubbing fastness dry and wet increases (5-10%) because of towel wash.

• Lycra protector is the reason for that part where as weight is different but composition is same among different number of samples.

• Polyester denim fabric shrinkage is more than twill fabric. But denim fabric tearing strength is more than twill fabric.

• Tearing strength has hedge change because of stone wash.

• Acid wash is responsible for decreasing shrinkage, tearing strength and tensile strength.

Due to some limitations we could not get the all information but we think further research will come in this topic.

References

1. http://textilemerchandising.com/different-types-of-denim-wash/
2. https://www.slideshare.net/mansikhuranaa/denim-wash-34263417
3. https://www.slideshare.net/pahanmazumder/garments-washing-66537225

   https://www.denimsandjeans.com/news/coolest-denim-booksworldwide/15641
4. http://textilelearner.blogspot.com
5. https://en.wikipedia.org/wiki/PH#pH
6. http://www.texanlab.com/documents/downloads/14.pdf
7. http://textilelearner.blogspot.com/2012/11/color-fastness-test-to-water-iso-105-eo1.html
8. http://textilelearner.blogspot.com/2011/08/color-fastness-to-rubbing-rubbing_1201.html
9. http://textilelearner.blogspot.com/2013/01/color-fastness-to-wash-iso-105-c06.html
10. http://textilelearner.blogspot.com/2014/03/dimensional-stability-to-washing.html
11. https://www.researchgate.net/publication/298586176_Colour_fastness_to_ozone
12. https://www.textiletoday.com.bd/the-denim-fabric-its-wash/

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