



**Faculty of Engineering  
Department of Textile Engineering**

**A Thesis on**

**Investigation of Silicon Wash, Enzyme Wash & Acid wash effects on knit garments**

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This thesis submitted in partial fulfillment of the requirements for the degree of **Bachelor of Science in Textile Engineering.** (

**Advance in Apparel Manufacturing Technology**

**April, 2018**



# Faculty of Engineering

## Department of Textile Engineering

### Approval Sheet

This research entitled “**Investigation of Silicon Wash, Enzyme Wash and Acid Wash effects on knit garments**” at Daffodil International University, April 2019” prepared and submitted by **Md.Sofiul Alom Antor (ID: 151-23-177), Abu Bakar Siddique (ID: 143-23-4067) & Md. Rajib Hossain (ID: 143-23-166)** in partial fulfillment of the requirement for the degree of BACHELOR OF SCIENCE IN TEXTILE ENGINEERING has been examined and hereby recommended for approval and acceptance.

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## ACKNOWLEDGEMENT

At first we want to thanks Allah because we complete this thesis by the blessing of Allah.

We complete the total thesis work at knit concern Group.

This is fully export oriented knit exports garments. We feel grateful to Sharmin Akter, Lecturer, Daffodil International University who give us chance to complete this thesis.

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We would like to express our thanks to **Prof Dr.Md. Mahbubul Haque** , Head ,Department of Textile Engineering, Daffodil International University for his kind help to finish this thesis.

## Declaration

We have declared this thesis which is done under our supervisor Sharmin Akter, Lecturer, Department of Textile Engineering, Daffodil International University.

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This is certify that the above declaration made by the candidates is correct to the best of our knowledge.

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## Abstract

This Paper deals with 3 types of washing .These are Silicon, Enzyme and Acid washing. Those 3 types of washing is applied on 100% S/J fabric, Terry fabric and Rib Fabric. Typical Washing process is followed in this task. We measure the GSM of after wash and before wash value of these three type of fabric, also measure Shrinkage, EPI, PPI, Pilling, Abrasion of those fabric. We used 3 type of machine to complete this work. We got significant change of properties between after and before wash. Specially the value of GSM varies lots. The value of shrinkage is decrease after washing. There is significant change in abrasion of those fabrics.

# **Chapter-1: Introduction**

## **1.1 Introduction:**

Washing is one of the vital process in the textile process. By washing process dust, dirt and unwanted material we can remove from fabric. So washing process is very important for a garment to give better look and soft feel. Washing provide special looks and full fill the requirement of fashion. Without proper washing we can not find right looks. There is Various types of Washing. Silicon Wash, Enzyme Wash, Acid Wash are widely used in textile sector. Those washing gives new looks and new appearance of fabric. Enzyme wash is very important because without this fabric softening can not be possible. Silicon wash concluded carbon hydrogen oxygen and some elements. Silicon is one of the most abundant element of all. Silicone oil, Silicones grease, Silicone rubber, Silicones resin, and Silicone caulk are some common form of This paper analyse the impact of silicon enzyme and acid wash and some value of different properties such as GSM, shrinkage, Pilling ,etc

## **1.2 Object of this Project:**

- To know about different type of washing
- To know about washing Process
- To know about washing machine
- To know about chemicals used in washing
- To know the changing properties of fabric

## **1.3 Importance of this project:**

Washing is very important sector in our textile sector. Without washing we can not obtain actual appearance and right colour. It full fill the requirement of garments. We are so lucky that we works on such a crucial topic. Washing is essential in many purpose . Now a days washing sector have a great job sector. So it can be sayed that importance of this thesis is lots.

#### **1.4 Scope of this Project :**

- Washing have a huge scope in the textile sector
- Washing have good job sector
- Rmg sector depends on Washing .
- Almost all factories have the scope to work on it

## Chapter-2: Literature Review

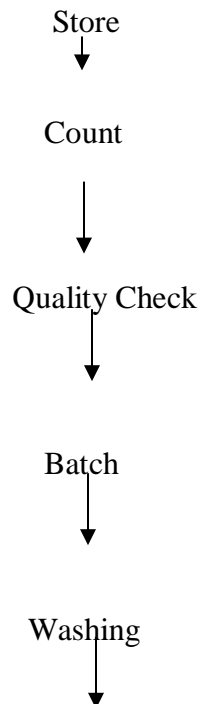
### 2.0 Definition:

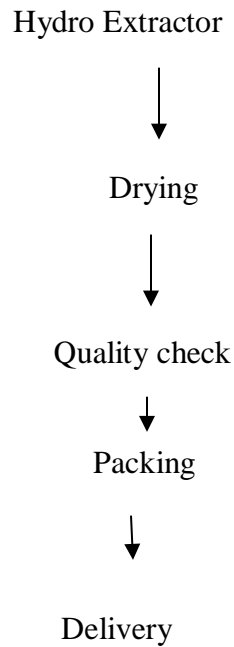
Garment washing is a process which is applied for change a garments outlook, appearance, comfortability, and design. By which process garments dust, dirt and impurities is removed. By washing we can give new appearance of garments. It is very important part of garments.

### 2.1 Object of Washing:

- To create new appearance
- Invent the new fashion
- Create new fashion such as tagging, grinding etc
- To Import softness and good hand feel
- To attract the customer
- To remove the dirt ,dust,etc

#### 2.1.2 Process flowchart of Washing:





### **2.1.3 Different types of Washing defect:**

- Over Blasting
- Over Grinding
- Bad smell
- Poor Hand feel
- High Hairiness
- Poor Brightness
- Dark and Light
- Spot
- Bottom hem
- Running shading
- Crease mark
- Colour shade

#### **2.1.4 Different type of garment washing:**

- Pigment Wash
- Enzyme Wash
- Stone Wash
- Bleach Wash
- Pannel Wash
- Trumble Wash
- Softener Wash
- Silicon Wash
- Enzyme Stone Wash
- Acid Wash
- Normal wash

Dry Wash:

- Sand Blasting
- Whisking
- Hand Scrapping
- Destroying

#### **2.1.5 List of Chemicals used in Washing**

- Whitening Agent
- Wetting Agent
- Detergent
- Fixing Agent
- Softening Agent
- Defoaming Agent
- Silicon
- Sulphate
- Potash

- Neutral Enzyme
- Bleaching Agent
- Chlorine
- Calcium Hypochlorite
- Caustic
- Soda
- Acetic Acid
- Hypo

#### **2.1.6 Washing Machine :**

- Sample Washing Machine
- Side Loading Washing Machine
- Front Loading Washing Machine
- Hydro Extractor
- Steam Dryer
- Gas Dryer
- Chemical Mixing Machine
- Industrial Woven
- Boiler
- Pump
- Grinding Machine
- Tagging Machine
- ETP
- Sand blasting gun
- Spray Gun
- Laser draw
- Spray Dummy
- Compressor



*[Figure – 01: Washing machine]*



**[Figure 02: Dryer machine]**

### **2.1.7 List of washing mill in Bangladesh:**

- Knit Concern
- Hams washing Ltd
- Jeans concept Ltd
- Mohammady Washing ltd
- Jeans culture ltd

- Apparels aid ltd
- Atlana Washing plant
- Sharoj Washing ltd
- Jeans care
- Zarings washing ltd

### **2.1.8 Advantages of Garments washing:**

- Make fabric soft and good hand feel
- Dirt dust can be remove
- Create new apparence
- Developed new techmique
- Cost effective
- Effective then fabric washing

### **2.2 Limitation of Garments Washing:**

- Due to shrinkage garments size is changed.
- Unfixed dyes is not removed but it needs to remove.
- More time needed
- More chamicalls needed

#### **2.2.1 Brief classification of Enzyme Washing:**

Enzyme wash-

- Amylase
- Cellulose
- Laccase
- Catalase

#### **2.2.2 Some property whicth is affected by Washing:**

- ✓ Appearance
- ✓ Size
- ✓ Color
- ✓ Out Look

- ✓ Comfort
- ✓ Design
- ✓ Fashion
- ✓ Etc

### **2.2.3 Function of Chemicals used in Washing:**

Enzyme-

- Create Faded effect
- Colour come from yarn portion

Detergent-

- It is widely used
- It removes the dirt dust etc

Acetic Acid-

- Takes the garments from alkaine condition

Antistain-

- Its increase the brightness of fabric

Bleaching Powder-

- Act as oxidizing Agent
- Its out colour from Denims Germents

Sodium Hyposulphate –

- Neutralize the garments from chlorine bleach

Caustic Soda-

- Works as cleaning power.

Salt-

- Fixed the Dye

Buffer-

- Control the PH

Stabilizer –

- Protect the break of per oxide.

Fixing Agent-

- Fixed the dye on Fabric

Resin-

- It creates the semi permanent creases

Desizing Agent-

- Remove waxes fat etc.

#### **2.2.4 .Different type of testing in washing sector:**

- Colour Fastness tes
- Crocking
- Color fastness to light
- Color fastness to laundering
- Color fastness to perspiration
- Colour fastness to water
- Colour fastness to sea water

- Construction test
- Count test
- Weight test
- Abrasion resistance
- Pilling Resistance
- Seam slippage
- Rain test
- Azo test
- Colour matching test

### **2.2.5. Washing condition of Garments:**

Temperature up to 60

Time up to 60 M

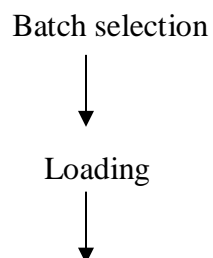
PH

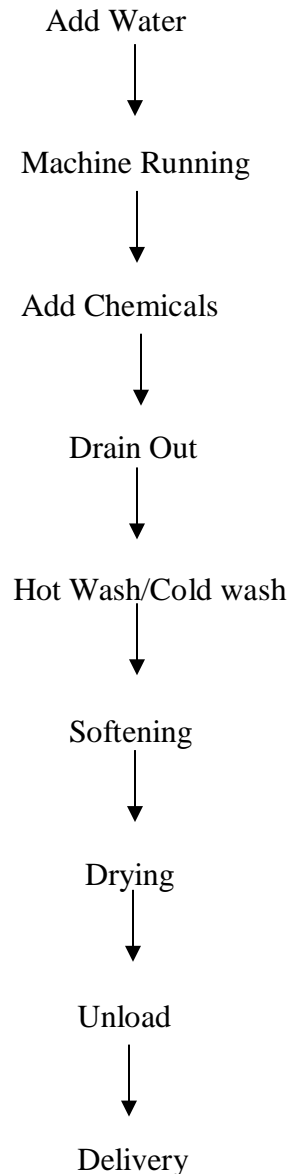
Concentration of chemicals up to 15 g/l

### **2.2.6 Washing plant of Garments:**

Washing plant might be automated, semi automated, An engineer is responsible for all process for control such as garments , machine, chemicals ,ph etc.

### **2.2.7. Process flowchart of Garments washing:**





### **2.3.Why Enzyme wash is essential?**

It remove the colour from fabric.We can obtain proper shade by this. We can obtain cast colour by enzyme wash.we can obtain actual abrasion by enzyme washing. We can increase the cleanliness of garments by enzyme washing.

#### **2.3.1 Problems we faced in enzyme washing-**

- Crease mark will create
- Bad seam will be created

- Abrasion will lose if indigo lets
- More time needed
- Possibility of bad garments

### **2.3.2 Importance of bleaching washing-**

- It remove the neutral colour
- Clean up the garments
- Remove stain
- We can obtain proper shade

### **2.3.3 Problems in bleaching washing-**

- Crease mark will come
- Loose the colour shade
- Spot will create
- Uneven shade will create

### **2.3.4 Some obstacle due to Resin used-**

- Garments will tear
- If woven time high tear will come
- If woven temp high tear will come
- Garments will hard
- Unwanted spotted will come
- Pocket may damage

### **2.3.5. Potential of Washing Sector in Bangladesh:**

Now a days washing is very important sector in Bangladesh. The demand of washing sector is increasing day by day. Job sector is now also very demandable in washing sector. There is lots of washing factory remain in Bangladesh. Specially denim wash is highly popular in Bangladesh.

### **2.3.6 Normal Wash**

Normal wash is one type of garments washing. We can remove starch, dust ,dirt by the normal wash. Softening is used in normal wash. We can delete unfixed dye by normal wash. Actual color fastness can be achieved. We can remove size material by normal wash. We can create good hand feel by normal wash. Normal wash is widely used in Bangladesh.

### **.3.7 Chemicals Need for Normal Wash:**

- Desizing Agent
- Detergent
- Auxiliaries
- Acetic Acid
- Softeners

### **2.3.8 Machine used In Normal Wash:**

#### **1. Washing Machine**



**[Figure 3 : Washing machine floor]**

## 2. Chemical Mixture Machine



**[Figure 4: Chemical Mixture Machine]**

## 3. Hydro Extractor



**[Figure 5: Hydroextractor]**

## 4. Dryer machine



**[Figure 6: Dryer]**

## **2.4 Process of Normal Wash:**

First step-

- Add water
- Machine start
- Maintain Temp and Time
- Add Detergent
- Drop the liquor
- Cold Wash

Second Step-

- Here we also added softener and acetic acid.

Third Step:

- In this step we removed extra water by hydro extractor.

Fourth Step-

- We used steam dryer to dry the garments.

Fifth step:

- Finally quality checking is done then its ready to delivery.

### **2.4.1 Process of Enzyme Wash:**

Enzyme is living substance . it act as catalyst in the washing process.

1<sup>st</sup> step-

Desizing is the first process of Enzyme wash. In this step all the dirt dust is removed.

Add Water

Machine Start

Desizing And Wetting Agent added

Maintain Temp and Time

Liquor drop

Cold Wash

2<sup>nd</sup> Step-

Almost same like 1<sup>st</sup> step

Add back staining

Drop Liquor

Cold Wash

This step is known as bio abrasion

3<sup>rd</sup> Step-

In this step we added Rinse wash we didn't in first two step.

It is known as back wash. Due to high temp all the enzymes are dead in this step. By rise wash those are removed.

4<sup>th</sup> Step-

This is not the mandatory in garments washing. Its additional process. Faded effect is done by this process. This process is known as additional bleaching.

Here normal wash is done instead of cold wash.

### **2.4.2 Process of Silicon Wash:**

We can applied silicon wash on all type of fabrics.

We can create softness, Hand feel by this type of washing. It helps the fabric for wear comfort.

First Step-

Lot Weight

Add water

Machine running

Add de sizing agent

Temp and time as per requirement

Drop The liquor

Rinse one times for 3 m

2<sup>nd</sup> Step-

Add water

Add acetic Acid

Cationic Softener

Add Silicon

Maintain Temp and time

Drain the bath

Unload the garments

3<sup>rd</sup> Step-

Here extra water is removed by hydro extractor.

4<sup>th</sup> Step – Drying Machine

Load garments

Maintain Temp and time

Cold dryer

5<sup>th</sup> Step – Drying

After dryer its delivered to quality section and drying is done.

## Chapter-3: Method And Materials :

### 3.1 Materials

**3.1.1 Garment's Samples :** 100% S/J , Terry Fabric , Rib Fabric

**3.1.2 Chemicals :** 10g silicon and 15g enzyme used in silicon and enzyme wash. Potash used in Acid wash. Softener is used.

**3.1.3 Washing Machine :** Sample dying Machine : KDLSW 2,3  
KDLSW 5,6

Hydroextractor

Dryer Machine



Figure : Washing machine

### 3.2 Methods

#### 3.2.1 Enzyme Wash` :

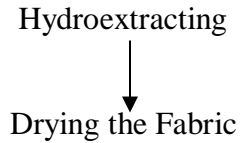
At first we took the fabric sample on Washing machine.

↓  
We Add 15g enzyme and 30 lt water.

↓  
We Add Detergent.

↓  
We run machine for 5 m at 50 degree temp.





### 3.2.2 Silicon Wash:

At first sample fabric is taken to the washing machine

↓

20 Ltr water and 20g silicon is used

↓

Machine is run for 5-7 times at 60 Temperature

↓

Tumble dryer is used to dry the wash fabric

### 3.2.3 Acid Wash:

At first fabric sample is taken to the washing machine

↓

20 gm potash and 2 litter water is used

↓

Per oxide is used

↓

Machine Run at temperature of 50

### 3.2.4 Determination of GSM/Fabric weight :

At first we cut 3 types of sample by GSM cutter. Then we measured it. We maintain standard. Electric balance is used . We took the avarege result.



[Figure 7: GSM cutter and Electric balance]

### **3.2.5 Determination of Shrinkage:**

At first we take different specimen of Rib, Terry and single jersey fabric. The width wise we took 44 and lengthwise 50. Then we boiled those distilled water for 15 m. Tumble dryer is used after boiling. Finally we took the measurement by width wise and length wise. Two types of shrinkage occur in garment one is lengthwise shrinkage another is widthwise shrinkage

### **3.2.6 Determination of Abrasion**

At first we take all the samples. We use measure the abrasion by martindale abrasion tester. We mount samples on the machine. we run the machine for 10 minutes. We record number of cycle until end point. Then we got the abrasion value.



**[Figure 8: Martindale Abrasion Tester]**

### **3.2.7 Determination of pilling**

At first we take all the specimen of fabric. We measure pilling by Martindale Abrasion Tester. Here we also run the machine for 10 minute. Then we count the number of pilling by the help of counting glass.



[Figure 9: Martindale Abrasion Tester]

### 3.2.8 Determination of Bursting:

At first we took 2 types of sample for bursting test. We use the ASTM F1140 machine to find the value. We got 4 different value of bursting strength. We measured both the after and before value . In this sequence we find out the bursting strength.



[Figure 10; Bursting Strength tester]

### 3.2.8 Determination of CPI/WPI:

We measure CPI & WPI by using counting glass and needle.



[Figure 11: Counting glass]

## Chapter-4: Discussion of Results:

**Table 4.1 Silicon ,Enzyme and Acid effect of wash on GSM.**

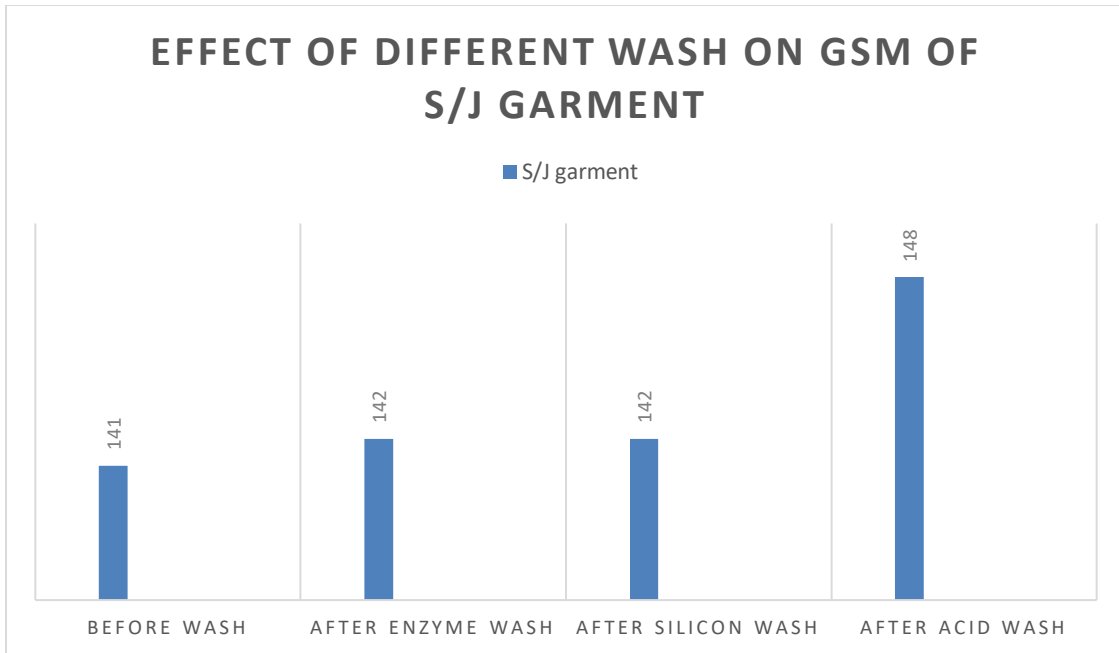
Parameters	S/j 100% cotton knit garments T-shirt	Rib garments T-shirt	Terry garments T-shirt
Before wash	141	211	255
After Enzyme wash	142	212	256
After silicon wash	142	214	256
After Acid wash	148	217	258

Before Washing single jersey fabric's GSM was 141. After enzyme wash its GSM is increase on 142. GSM is increase for shrinkage. After silicon wash it's GSM is increase on 142. After acid wash this GSM is increase on 148.

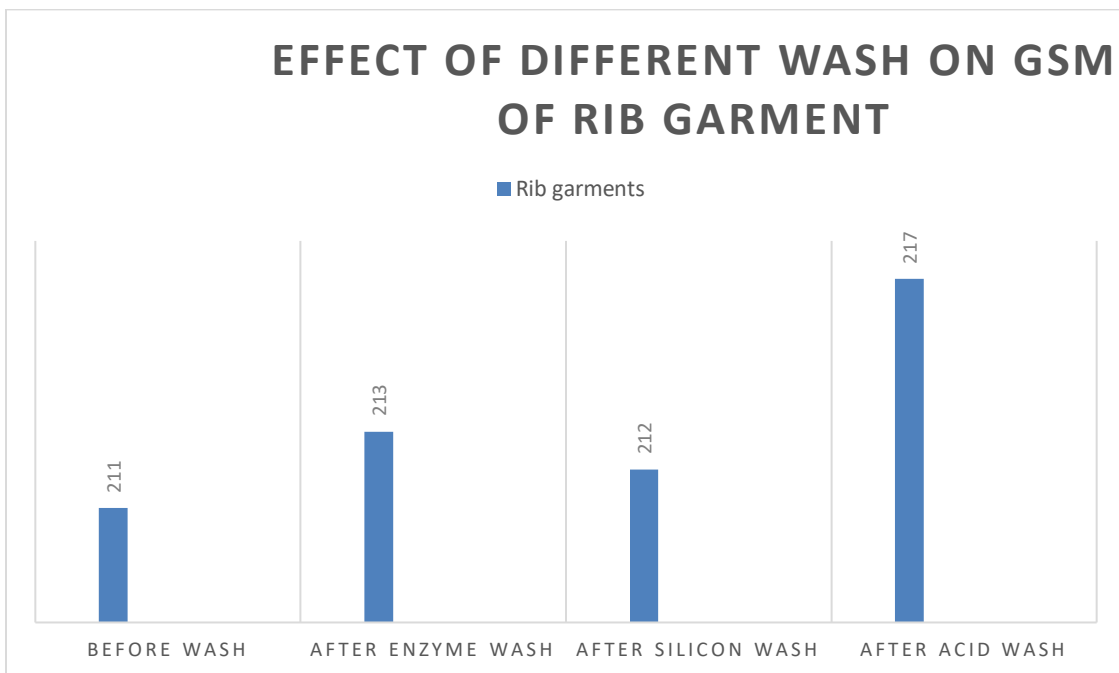
In Rib fabric Before washing GSM is 211. After Enzyme wash it's GSM increase on 212. After silicon wash this GSM is increase on 214. When acid wash is occur then this fabrics GSM is 217

When we used terry fabric for washing here we get before wash 255 GSM. After Enzyme wash this fbrics GSM value is 258. After silicon wash this fabrics GSM value is 256. After acid wash GSM value is 257.

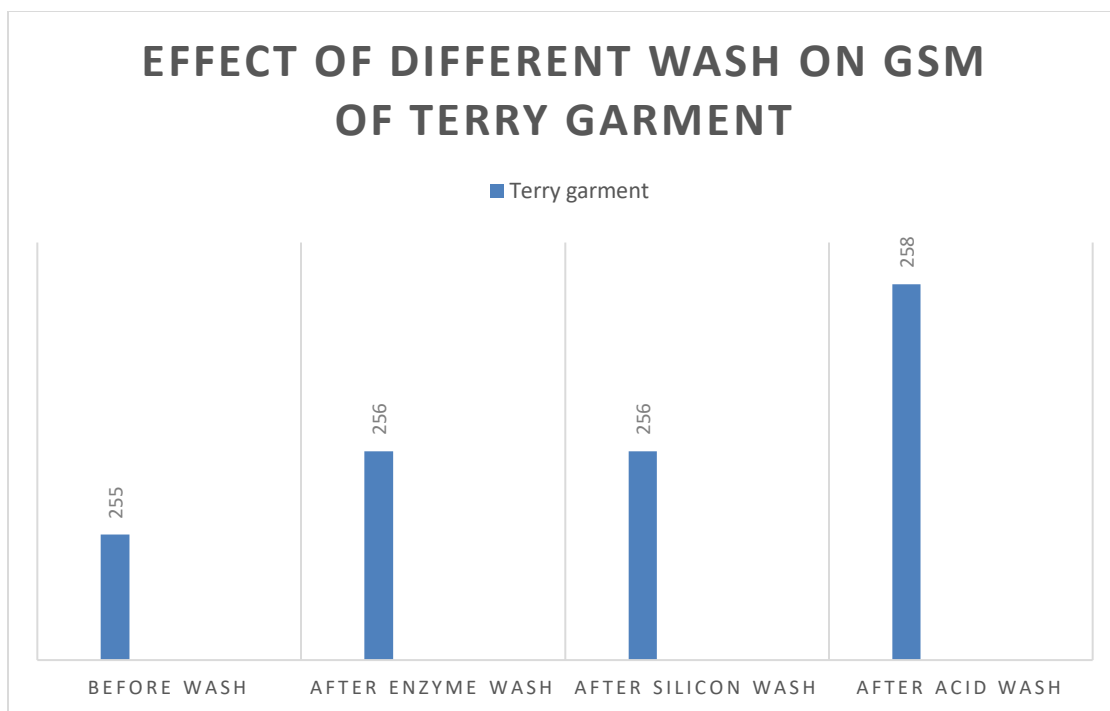
Here we can see after Acid wash GSM is more then Enzyme wash & silicon wash.



**[Figure 12: Effect of different wash on GSM of S/J garment]**



**[Figure 13: Effect of different wash on GSM of Rib garment]**



**[Figure 14: effect of different wash on GSM of Terry garment]**

**Table 4.2 Silicon ,Enzyme and Acid effect of wash on Shrinkage.**

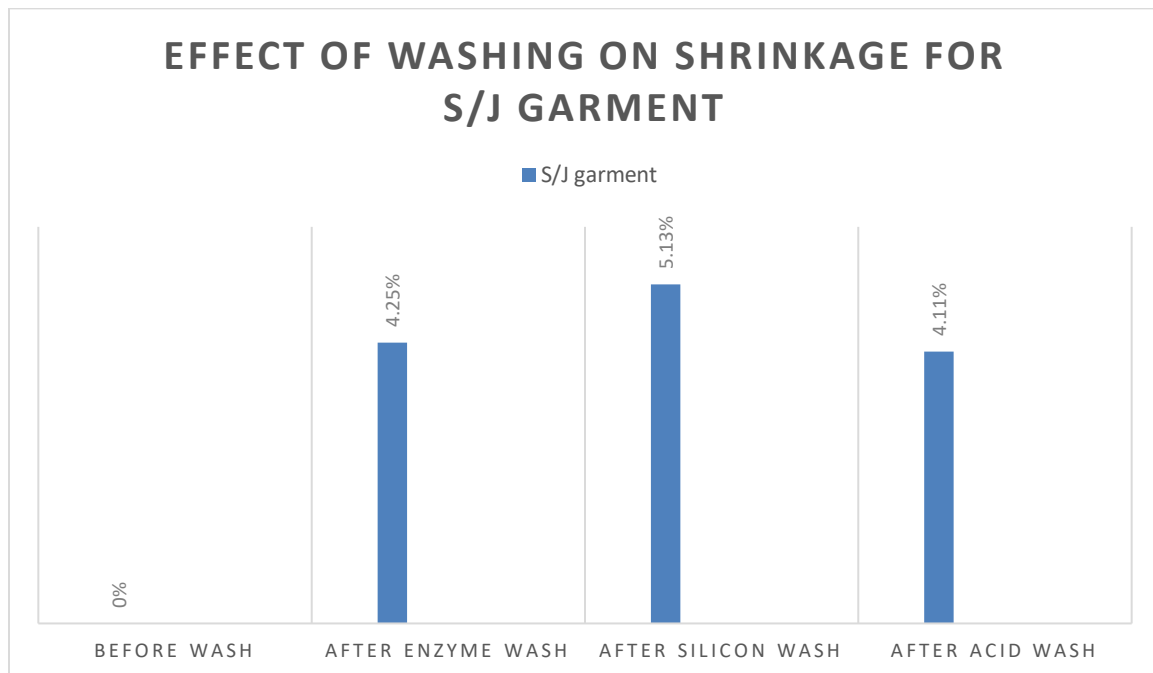
Parameters	S/j 100% cotton knit garments T-shirt	Rib garments T-shirt	Terry garments T-shirt
Before wash	4 %	5%	5%
After Enzyme Wash	4.25 %	4.58%	4.72%
After Silicon Wash	5.13%	4.1%	3.57%
After Acid Wash	4.11%	4.01%	4.52%

After Enzyme wash in single jersey garment 4.25% shrinkage will occur. After silicon wash in single jersey garment's shrinkage percentage is 5.13%. After acid wash this garments shrinkage % is 4.11%.

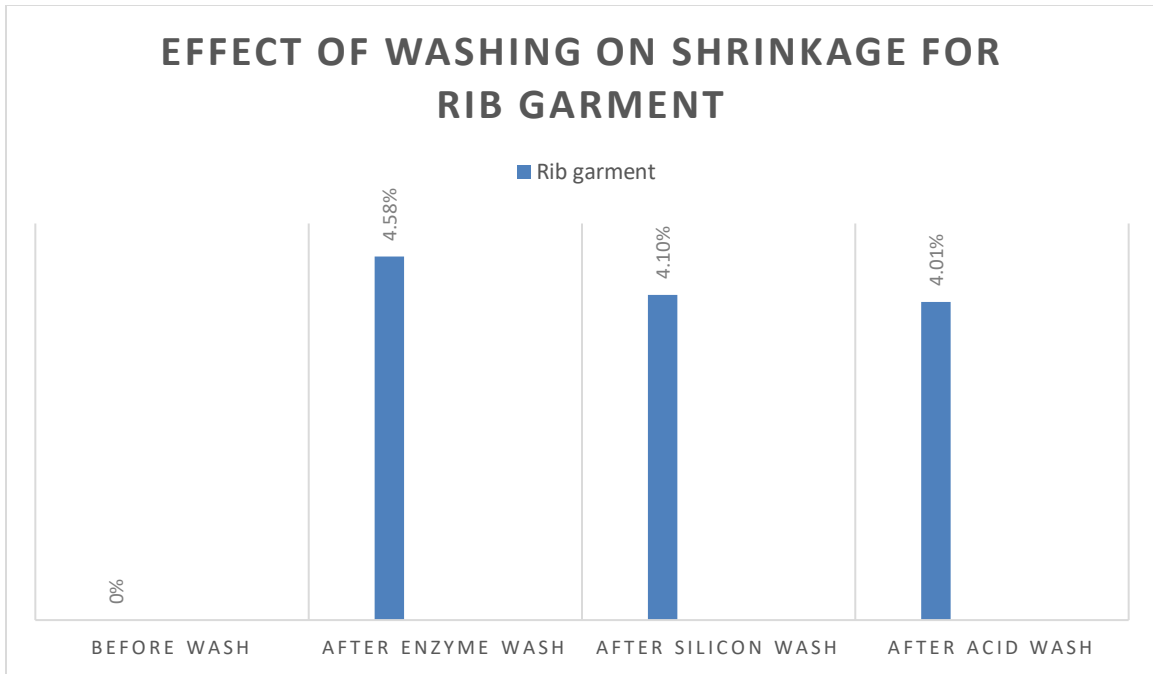
In Rib garments after enzyme wash shrinkage percentage is 4.58%. After silicon wash shrinkage percentage is 4.1%. After acid wash shrinkage percentage is 5.01%.

In Terry garment's after enzyme wash shrinkage percentage is 4.72%. After silicon wash shrinkage percentage is 3.57%. After acid wash shrinkage percentage is 4.52%.

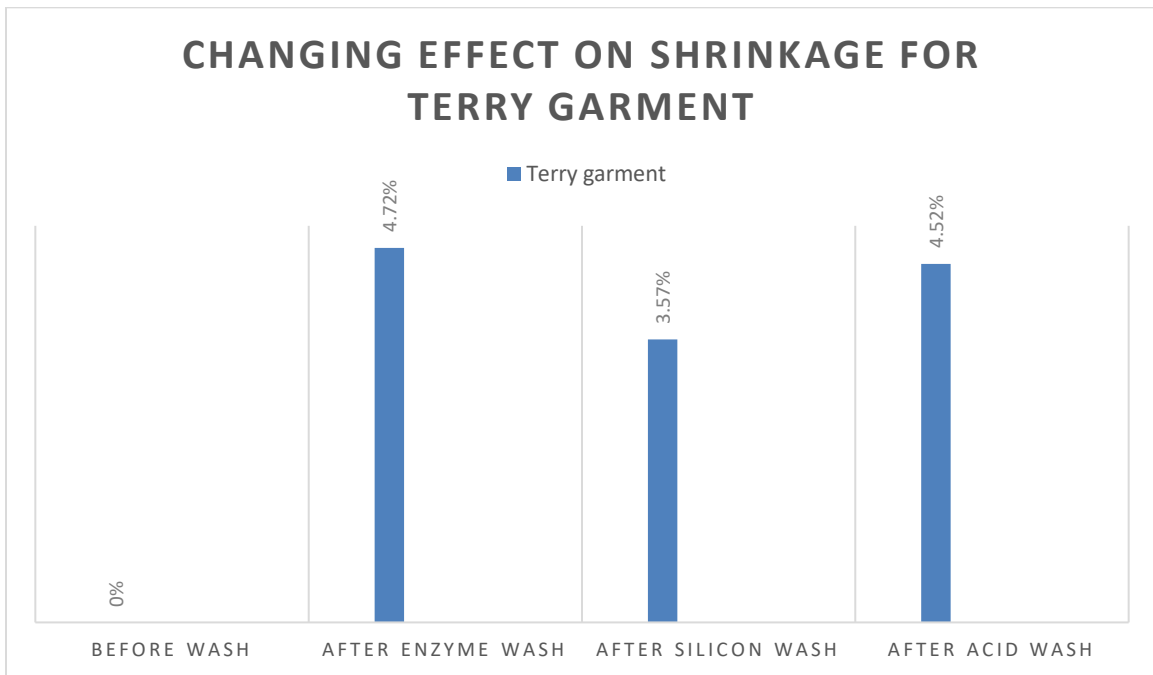
If a garment's shrinkage percentage is greater than 5 this garment is rejected. Here we can see single jersey garment after silicon wash its shrinkage percentage is 5.13% . this garment is rejected.



**[Figure 15: effect of washing on shrinkage for s/j garment]**



**[Figure 16: Effect of washing on shrinkage for Rib garment]**



**[Figure 17: Effect of washing on shrinkage for Terry garment]**

**Table 4.3 Silicon , Enzyme and Acid effect of wash on Abrasion.**

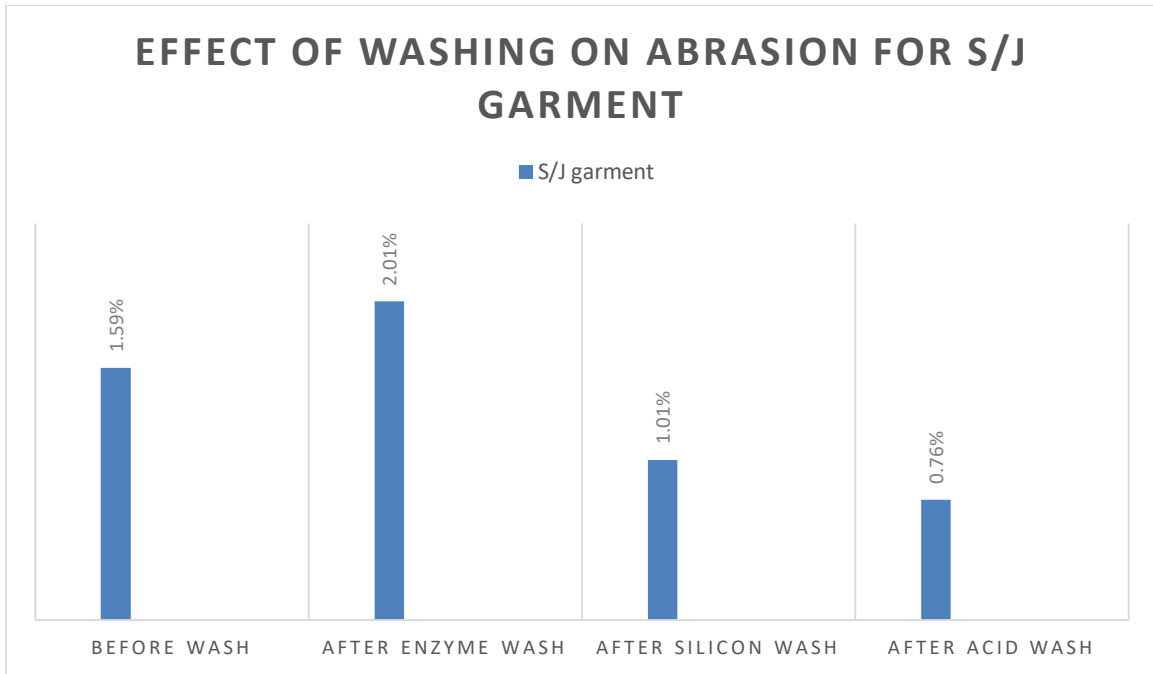
Parameters	S/j 100% cotton knit garments T-shirt	Rib garments T-shirt	Terry garments T-shirt
Before Wash	1.59 % weight loss	1.31% weight loss	0.94% weight loss
After Enzyme Wash	2.01% weight loss	0.31% weight loss	1.25% weight loss
After Silicon Wash	1.01% weight loss	1.52% weight loss	0.52% weight loss
After Acid Wash	0.76% weight loss	2.05% weight loss	0.76% weight loss

After abrasion test we can see,

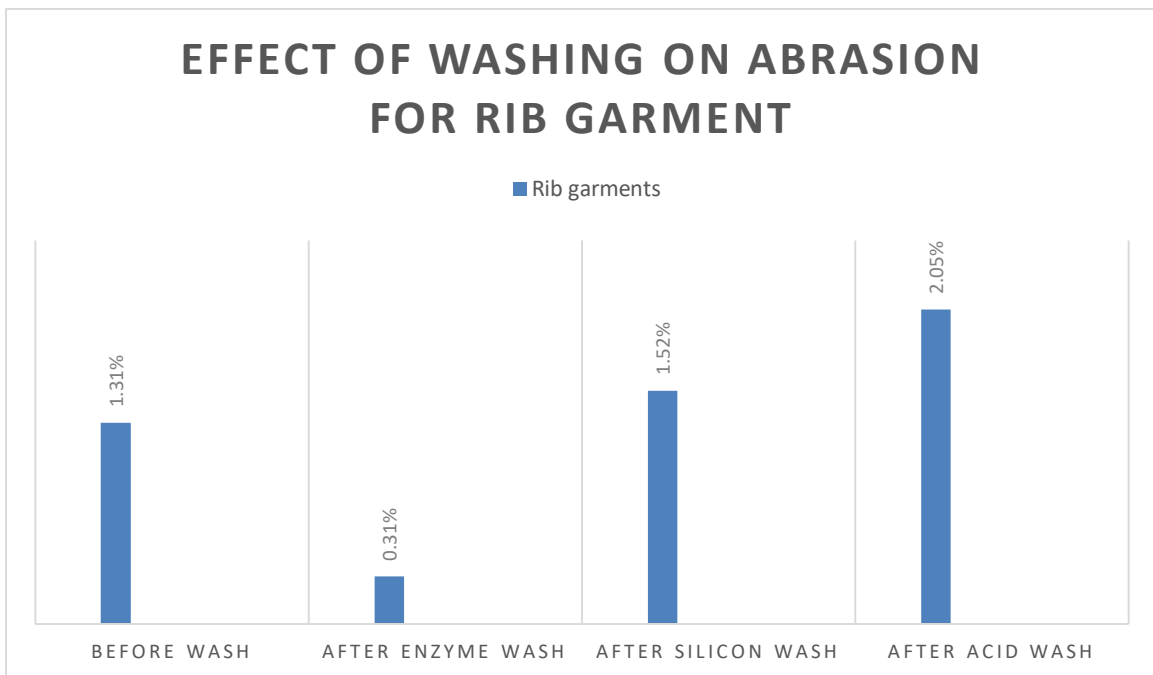
In single jersey garment before washing 1.59% weight loss. After Enzyme wash 2.01% weight loss. After silicon wash 1.01% weight loss & after acid wash 0.76% weight loss.

In Rib garments before wash 1.31% weight loss. After Enzyme wash 0.31% weight loss. After silicon wash 1.52% weight loss. & after acid wash 2.05% weight loss.

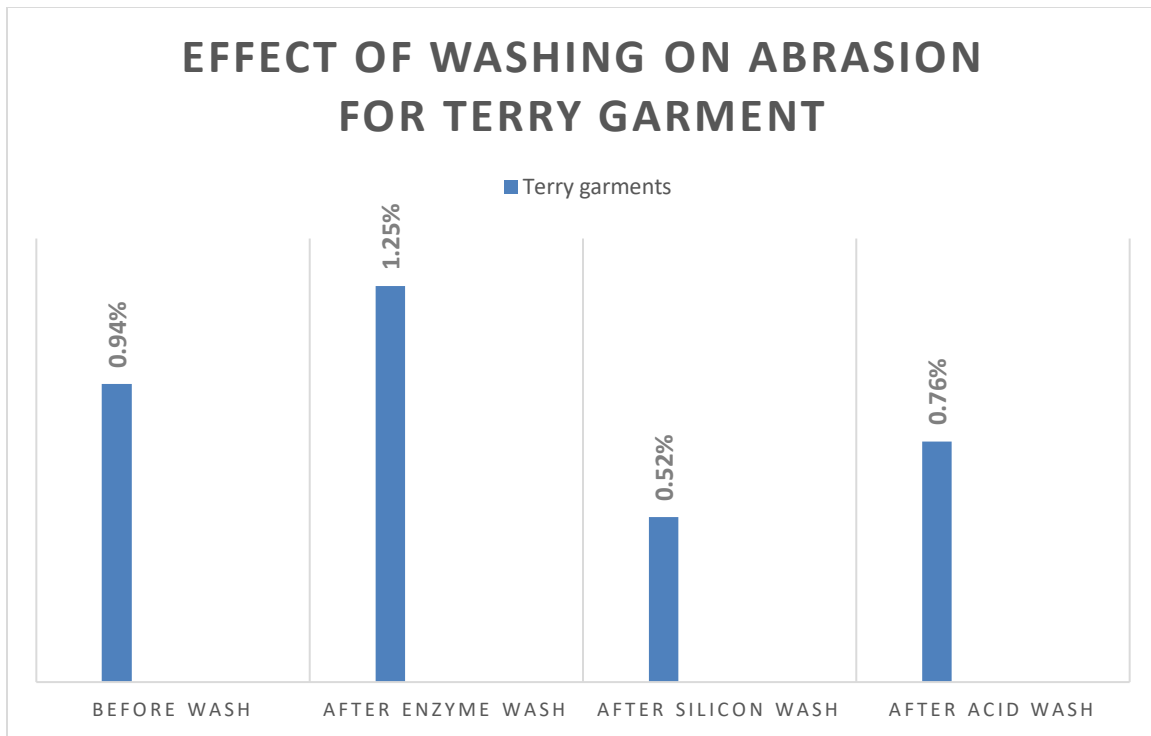
In terry garment's before wash weight loss percentage is 0.94% . After Enzyme wash weight loss percentage is 0.52%.After silicon wash 0.52% weight loss. After acid wash weight loss percentage is 0.76%.



**[Figure 18: effect of washing on abrasion for S/J garment ]**



**[Figure 18: effect of washing on abrasion for Rib garment ]**



[Figure 18: effect of washing on abrasion for Terr garment ]

**Table 4.4 Silicon , Enzyme and Acid effect of wash on Pilling.**

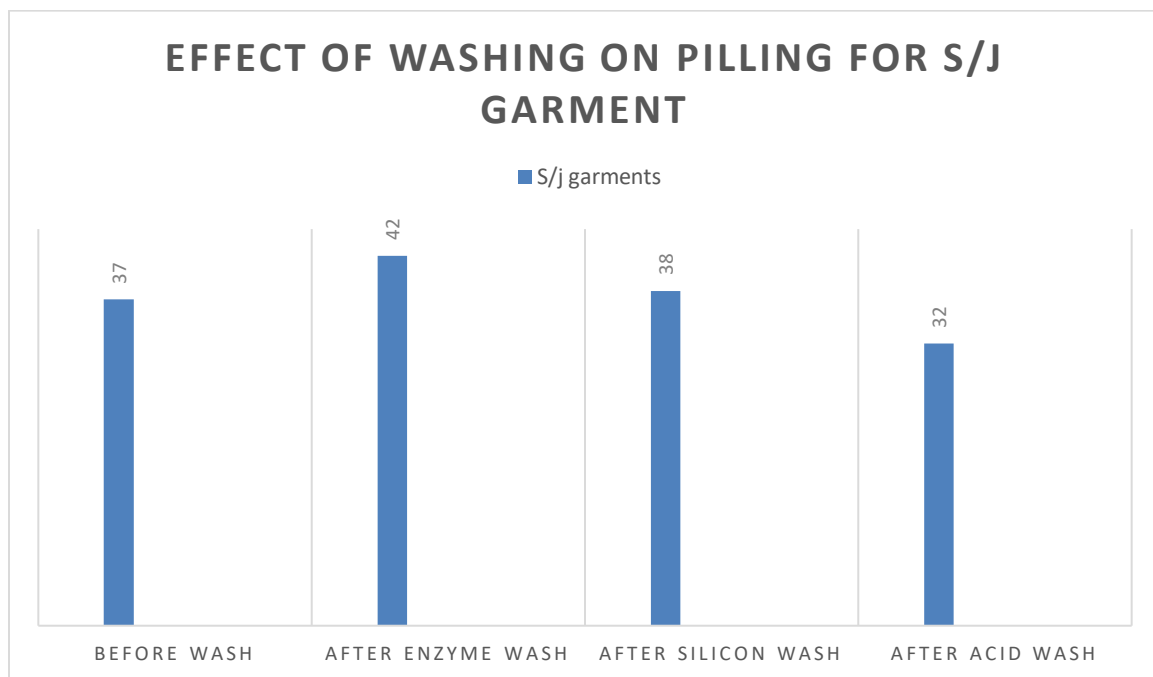
Parameters	S/j 100% cotton knit garments T-shirt	Rib garments T-shirt	Terry garments T-shirt
Before Wash	37 no. of pill	53 no. of pill	43 no. of pill
After Enzyme Wash	42 no. of pill	48 no. of pill	40 no. of pill
After Silicon Wash	38 no. of pill	51 no. of pill	39 no. of pill
After Acid Wash	32 no. of pill	42 no. of pill	37 no. of pill

Before washing single jersey fabric has 37 number of pill. And rib fabric has 53 number of pill. And terry fabric has 43 number of pill.

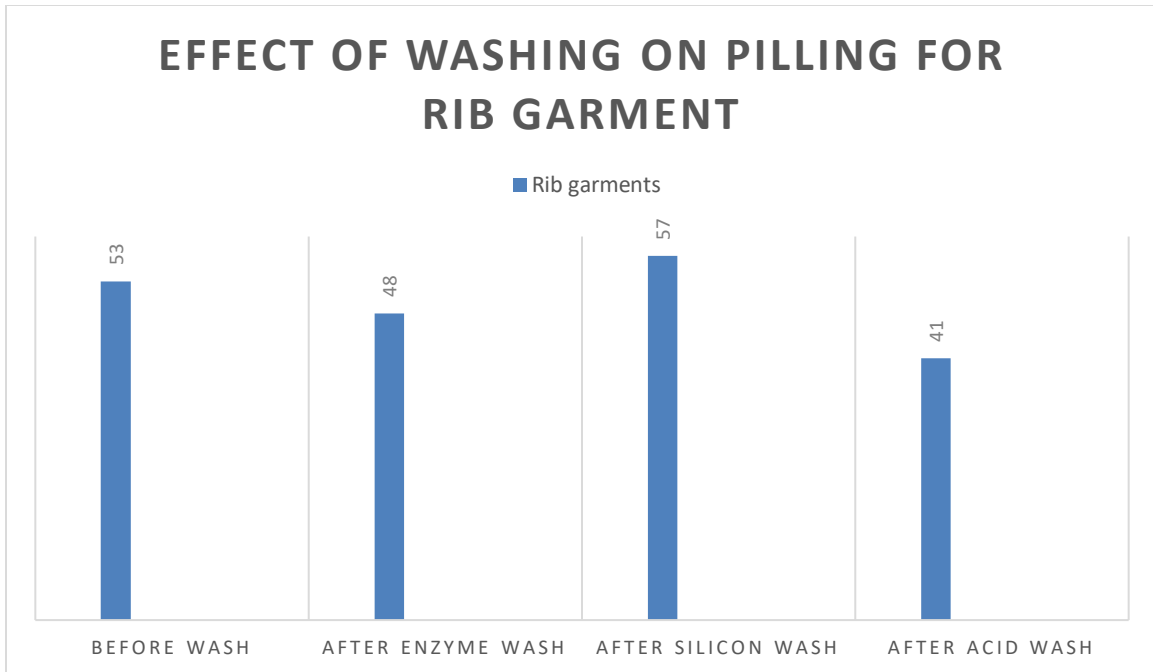
After Enzyme wash we can see single jersey fabric show 42 number of pill. Rib fabric show 48 number of pill. And terry fabric show 40 number of pill.

After silicon wash we can see single jersey fabric show 38 number of pill. Rib fabric show 51 number of pill of pill & terry fabric show 39 number of pill.

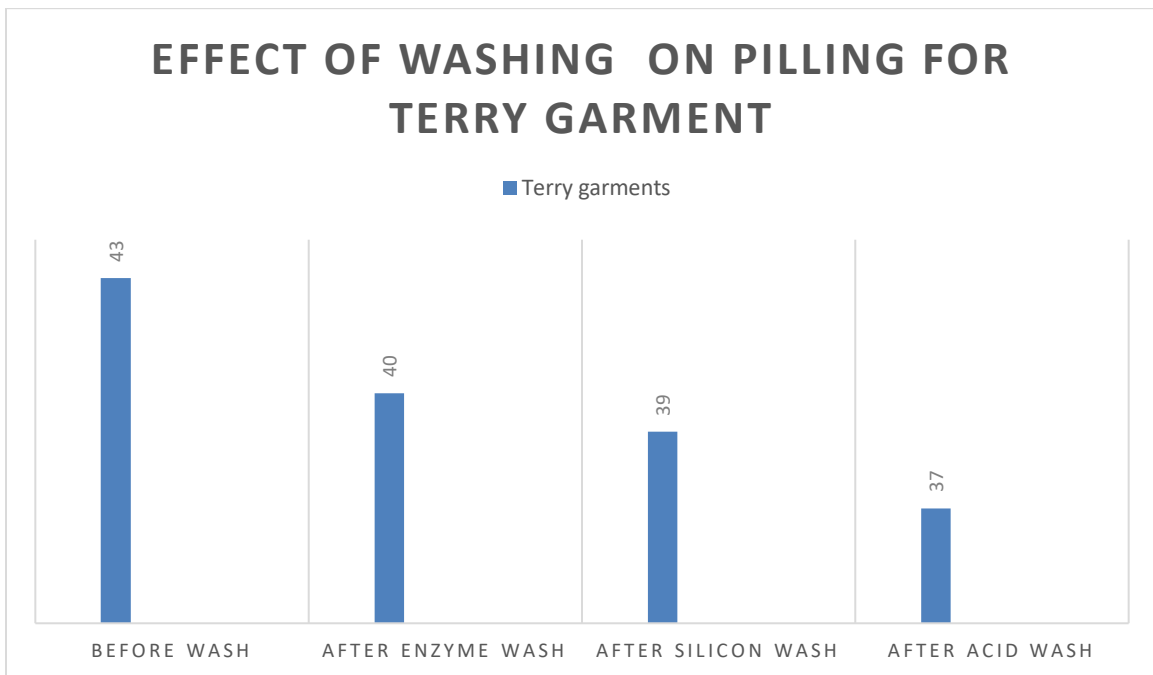
After acid wash we can see single jersey show 32 number of pill. Rib fabric show 42 number of pill & terry fabric show 37 number of pill.



**[Figure 19: Effect Of Washing on Pilling For S/J Garment]**



**[Figure 20: effect of Washing on pilling for Rib garment]**



**[Figure 21: Effect of Washing on pilling for Terry garment]**

**Table 4.5 Silicon ,Enzyme and Acid effect of wash on CPI.**

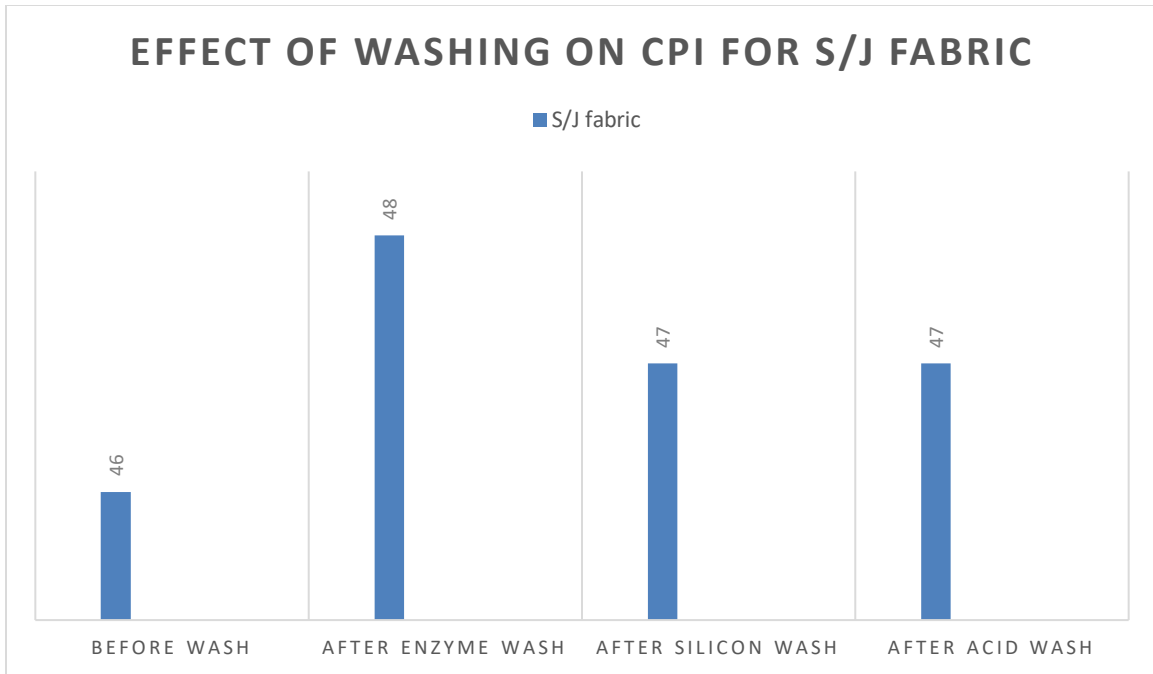
<b>Parameters</b>	<b>S/j 100% cotton knit garments T-shirt</b>	<b>Rib garments T-shirt</b>	<b>Terry garments T-shirt</b>
Before Wash	46	54	55
After Enzyme Wash	48	56	57
After Silicon Wash	47	56	57
After Acid Wash	47	55	58

Before wash single jersey fabrics CPI was 46 .Rib fabrics CPI 54 & Terry fabrics CPI 55.

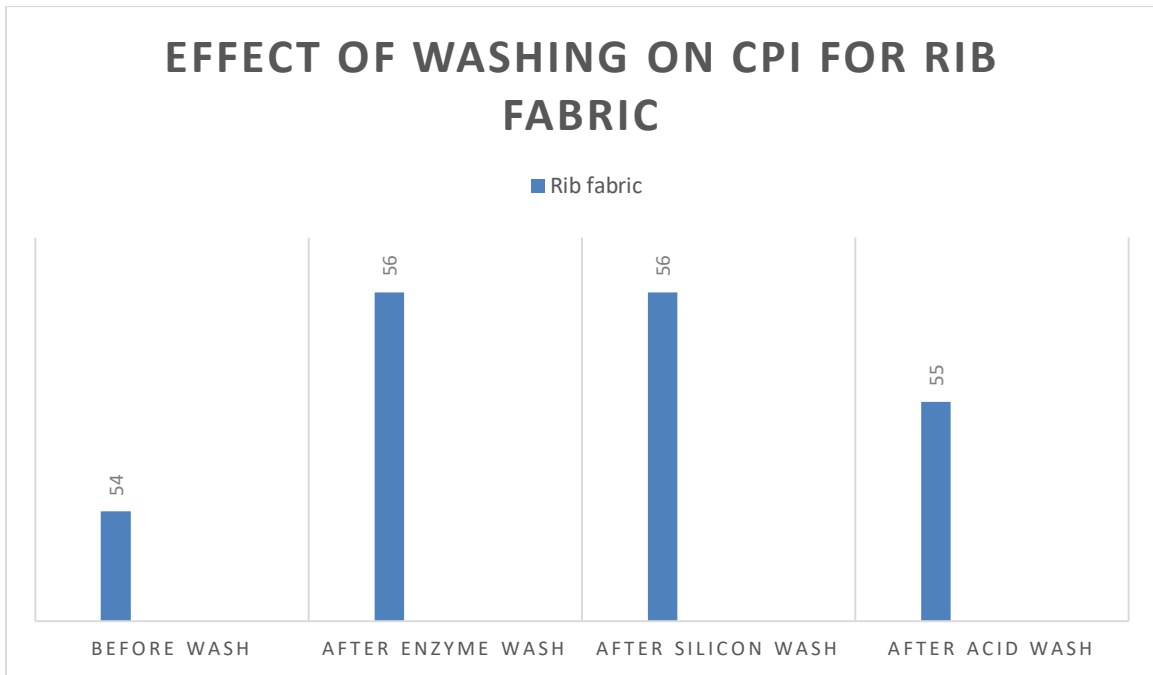
After Enzyme wash single fabrics CPI was changed from 46 to 48. Rib fabrics CPI was changed from 54 to 56. & Terry fabrics CPI was changed from 55 to 57.

After silicon wash single jersey fabrics CPI was changed from 46 to 47. Rib fabrics CPI was changed from 54 to 56. & Terry fabrics CPI was changed from 55 to 57.

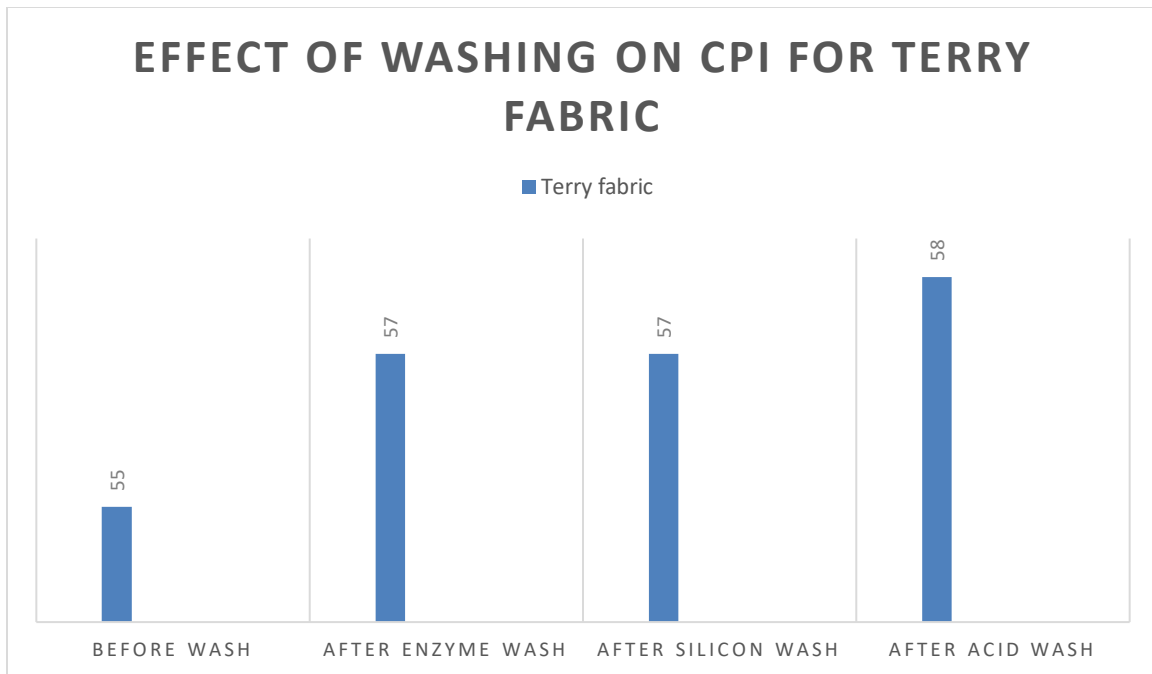
After acid wash single jersey fabrics CPI was changed from 46 to 47. Rib fabrics CPI was changed from 54 to 55 & Terry fabrics CPI was changed from 55 to 58.



**[Figure 22: Effect of washing on CPI for s/j fabric]**



**[Figure 23: Effect of washing on CPI for Rib fabric]**



**[Figure 24: Effect of washing on CPI for s/j fabric]**

**Table 4.6 Silicon , Enzyme and Acid effect of wash on WPI.**

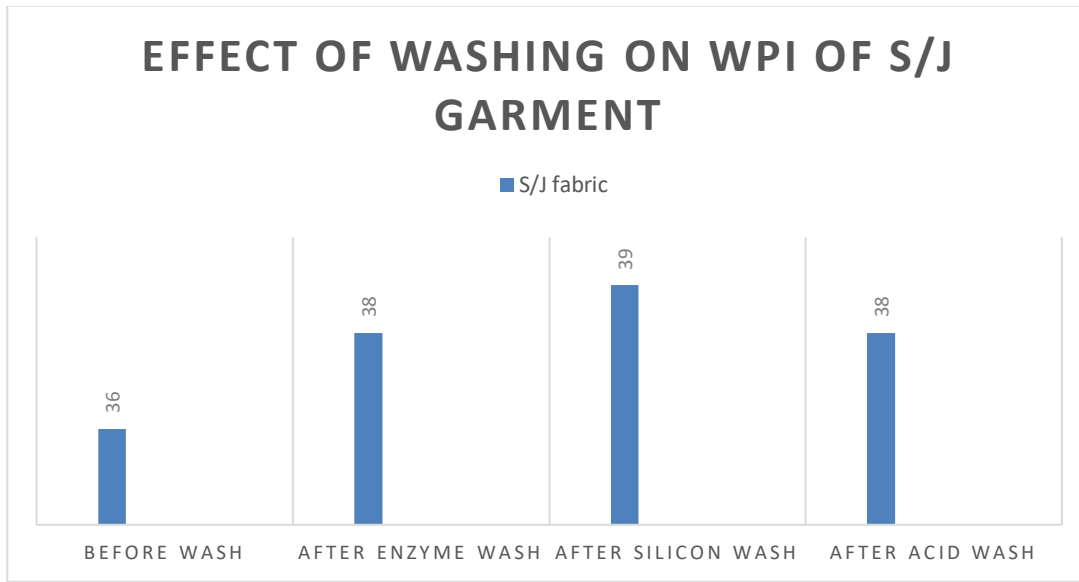
Parameters	S/j 100% cotton knit garments T-shirt	Rib garments T-shirt	Terry garments T-shirt
Before Wash	36	72	27
After Enzyme Wash	38	75	31
After Silicon Wash	39	74	29
After Acid Wash	38	76	31

Before wash single jersey fabrics WPI is 36 , Rib fabrics WPI is 72 & Terry fabrics WPI is 27.

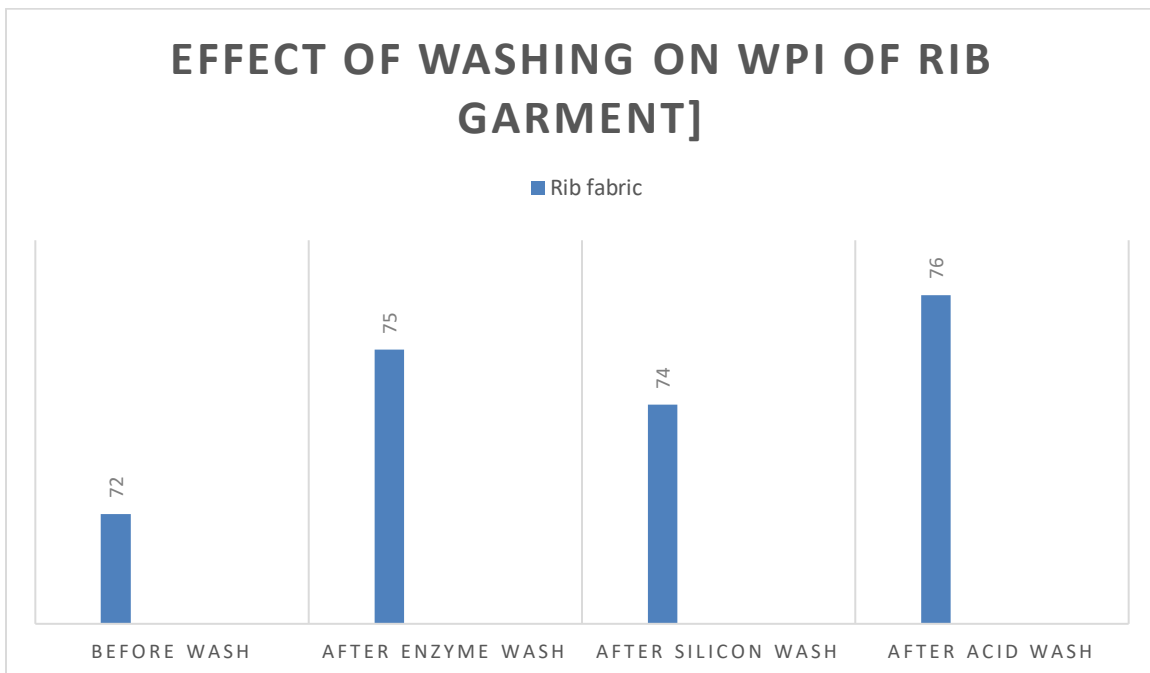
After EnZyme wash single jersey fabrics WPI was changed from 36 to 36, Rib fabrics WPI was changed from 72 to 75, & Terry fabrics WPI was changed from 27 to 31.

After silicon wash single jersey fabrics WPI was changed from 36 to 39, Rib fabrics WPI was changed from 72 to 74 & Terry fabrics WPI was changed from 27 to 29.

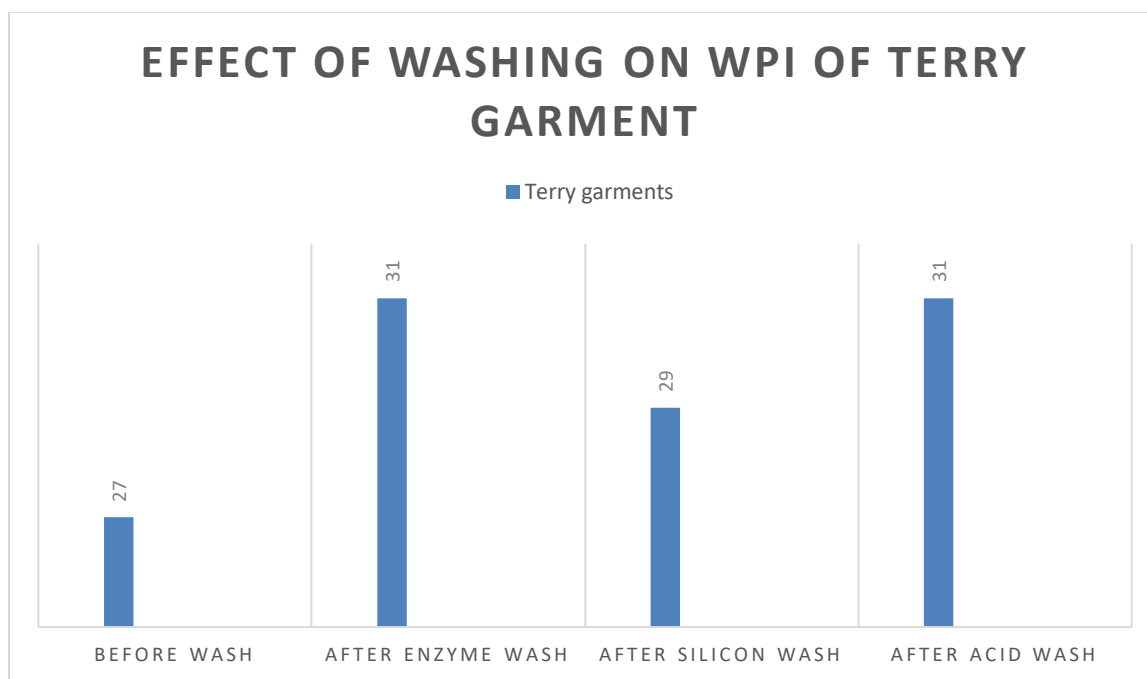
After acid wash single jersey fabrics WPI was changed from 36 to 38, Rib fabrics WPI was changed from 72 to 76 & Terry fabrics WPI was changed from 27 to 31.



[Figure 25: Effect of washing on WPI of S/J garment]



[Figure 26: Effect of washing on WPI of Rib garment]



[Figure 27: Effect of washing on WPI of Terry garment]

**Table 4.7 Silicon , Enzyme and Acid effect of wash on Brusting Test.**

Parameters	S/j 1005 cotton knit garments T-shirt	Rib garments T-shirt	Terry garments T-shirt
Before Wash	362 kpa	440 kpa	446 kpa
After Enzyme Wash	345 kpa	420 kpa	432 kpa
After Silicon Wash	351 kpa	416 kpa	432 kpa
After Acid Wash	337 kpa	420 kpa	438 kpa

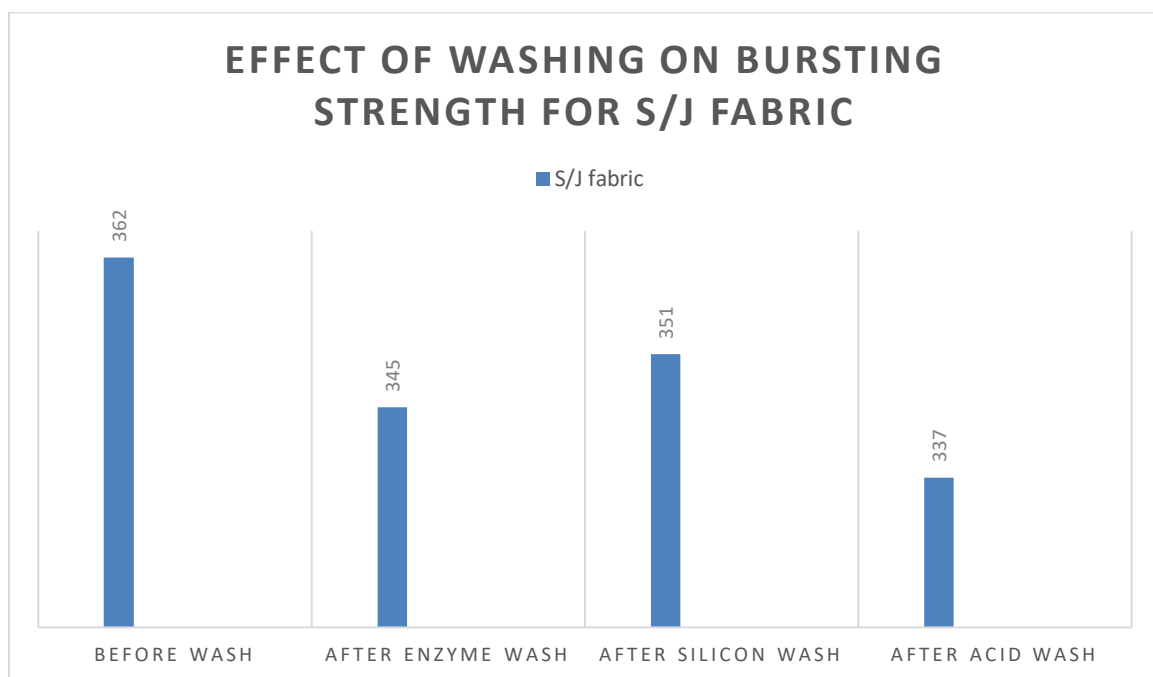
Before wash Single jersey fabrics bursting strength can be measure 362 kps. Rib fabrics strength 440 kps & Terry fabrics bursting strength 446 kps.

After Enzyme wash single jersey fabrics bursting strength was changed from 362 kpa to 345 kpa, Rib fabrics bursting strength was changed from 440 kpa to 420 kpa & Terry fabrics bursting strength was changed from 446 kpa to 432 kpa.

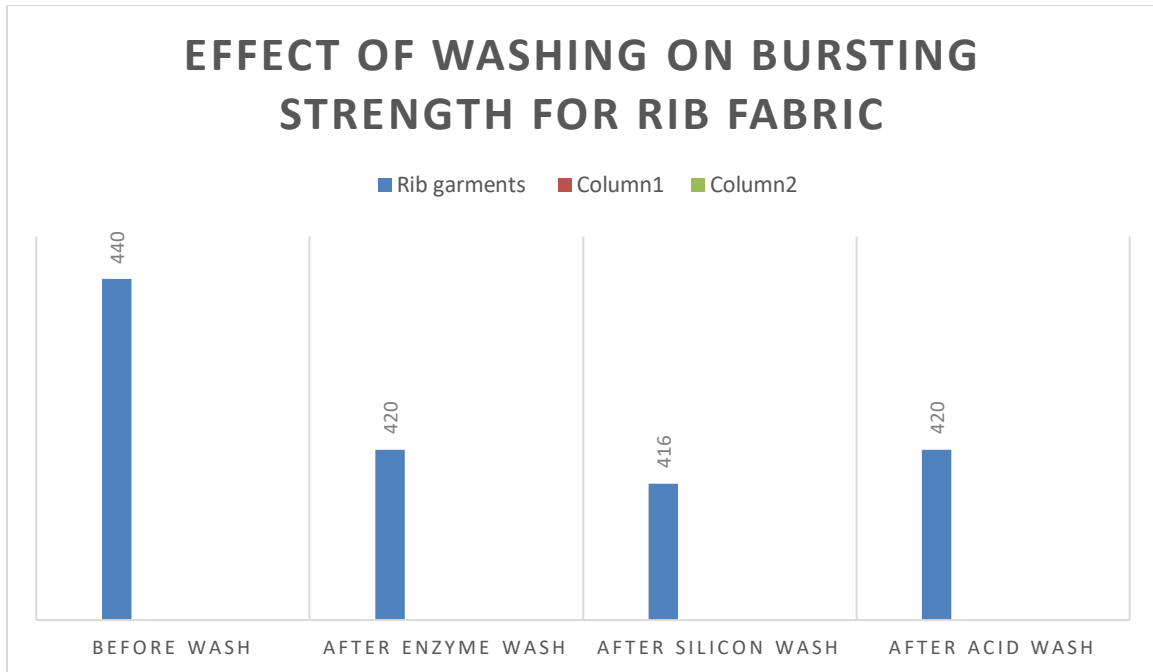
After silicon wash single jersey fabrics bursting strength was changed from 362 kpa to 351 kpa Rib fabrics bursting strength was changed from 440 kpa to 416 kpa & Terry fabrics bursting strength was changed from 446 kpa to 432 kpa

After acid wash single jersey fabrics bursting strength was changed from 362 kpa to 337 kpa, Rib fabrics bursting strength was changed from 440 kpa to 420 kpa & Terry fabrics bursting strength was changed from 446 kpa to 438 kpa

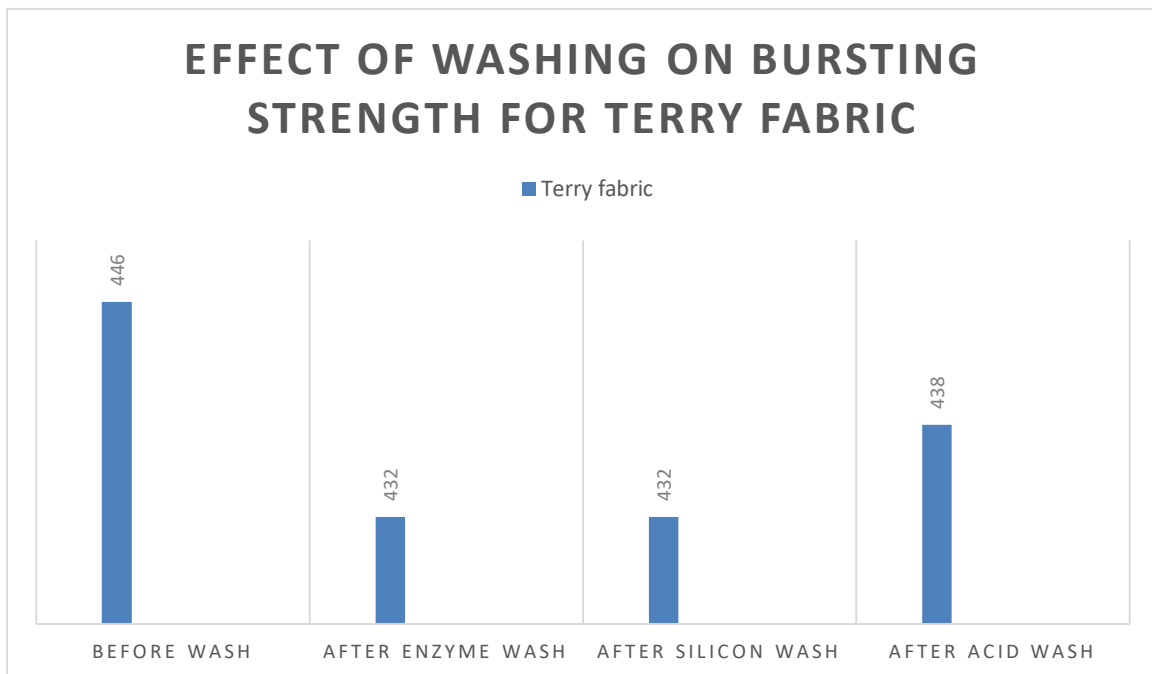
Here we can see after wash fabrics bursting strength was decrease.



**[Figure 28: effect of washing on bursting strength for S/J fabric]**



**[Figure 29: effect of washing on bursting strength for Rib fabric]**



**[Figure 30: effect of washing on bursting strength for S/J fabric]**

## Chapter-5: Conclusions

Washing is very important sector at present in textile sector. We are so we lucky we got the chance to work with this topic. By doing this project we have learn lots about washing sector. In this project we did 3 type of washing of 3 type of samples. We determine the different properties of fabric. By doing this task we learn how to determine the properties of washing fabric. We understand the value of washing in textile sector. Over all it was great experience to work on Washing.

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