Faculty of Engineering

Department of Textile Engineering

THESIS REPORT ON

Study on Different types of wash effect on denim garments

Course Title: Project (Thesis)
Course Code: TE 4214

Submitted By

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This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Textile Engineering.

Advance in Apparel Manufacturing Technology
November, 2018

Letter of Approval

To
The Head
Department of Textile Engineering
Daffodil International University
102, Sukrabad, Mirpur Road, Dhanmondi, Dhaka-1216.

Subject: Approval of Project of B.sc in TE program

Dear Sir,

I am just writing to let know that, this thesis report titled as "diferent types of wash effect on denim garments" has been prepared by the students bearing are Sultan Mahmud(151-23-4226) and Md. Sahidul Islam (151-23-4228) 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 students 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 and consider it for final evaluation.

Yours Sincerely

Engr. Mohammad Abdul Baset

Assistant Professor

Department of Textile Engineering

Faculty of Engineering

Daffodil International University.

DECLARATION

We hereby declare that, this thesis report has been done by us under the supervision of Engr. Mohammad Abdul Baset, Assistant Professor, Department of Textile Engineering, Daffodil International University. We also declare that neither this thesis nor any part of this thesis report has been submitted elsewhere for award of any degree.

Submitted by:

Name	ID	Signature
Md. Sultan Mahmud	151-23-4226	……...
Md. Sahidul Islam	151-23-4228	……...

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

Acknowledgement

At first we would like to express our deep appreciation to Allah for providing the opportunity to complete our thesis on date study on different type of wash effect on denim garments.

We would like to thanks the management of "Ananta Denim Technology Ltd" for giving us the opportunity to perform the Thesis Successfully.

We are grateful and feel indebtedness to our Department Head **Prof. Dr. Md. Mahbubul Haque**, Department of Textile Engineering, Faculty of Engineering, Daffodil International University. Special thanks goes to our honorable supervisor **Engr. Mohammad Abdul Baset**, Assistant Professor Department of textile engineering, Daffodil International University for providing his valuable suggestion and guideline.

From our heartiest Thanks to, Mr. Sharif Zahir, Managing Director Ananta Group and our factory supervisor who supervised us & Mr. Abdul Alim , GM in washing plant of Ananta Denim for their teaching, supervising and advising during prepare to our Thesis report. We hope their valuable information regarding to production process will help us lot for our engineering carrier.

DEDICATION

At first we want to dedicate this thesis report to almighty Allah for giving us this opportunity to prove ourselves .Without almighty helps nothing would be possible.

Then we want to dedicate our report to our parents. We love them very much for completing our study they play a vital role to complete this thesis. It's very pleasure for us .Without their help it is impossible for us to complete this thesis. And we also want to dedicate this report of our parents and our teacher.

ABSTRACT

This thesis paper contains the all types of washing process and washing effect on denim garments of the industry. We have visited to ADTL collecting the related data for different type of washing process.

After applying all those process, we have compared before and after wash effect. We completed to washing process, recipe and different type of wash effect .Finally we proposed to production system has been modeled and ensure the better productivity.

In this paper, we discussed some procedure about different type of washing process, recipe and different type of washing effect and also discussed about analysis of different wash effect. After analysis of different wash effect, we completed comparisons on it. Finally we achieved result of different wash effect i. e. gray, blue, marbelish, cross hatch etc, shade, tone, handfeel, appearance and rejection percentage. For 70% cotton ,20%polyster ,8%ryon,2%spandex denim garments-30% handfeel increase, 20% slubs visible, rejection (4-5)% and For 99%cotton ,1%spandex denim garments- 40% slubs visible and rejection (3-4)%.

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CHAPTER-1

INTRODUCTION

1.1 Introduction

Industrial washing is one of the important applied finishing methods on fabric and apparel. Different Type of washing method can be applied on denim garment finishing. To required special outlook as well as to change the fashion. The washing methods are stone wash, bleach wash enzyme wash, towel wash is mainly responsible to produce fashionable shade. Denim fabric produce from the twill weave including wrap yarns dyed with Sulphur/indigo color and undyed white weft yarns. From some years ago we were already using fully biodegradable enzymes and some chemical which are environmental nontoxic in the modern textile finishing process. A number of mechanical of chemical operations can be replaced by enzymatic treatment, which have been applied to improve fabric quality. Recently some papers have been published to analyze the change of textile's color after applying in different finishing methods as clients when choosing an item from shop always pay attention to its color. Specification of fabric (ends/inch, picks/inch, surface density, warp & weft linear density) Fabric tensile strength, fabric stiffness, seam strength, etc. Must be treated as important Characteristics as those determine wear durability and longevity. However as important enzyme wash on the changes of above mentioned characteristics are clearly evaluated in this paper.

1.2 Nature of the work in washing:

Denim garment (Jeans) washing is known as one of the widely used important treatment that has vast usage in textile sectors because of creating special appearance and making fashionable and wear comfortable garments of the present day world and commonly used. For this it essentially needs a finishing treatment to make it softer, more supple, smooth and comfortable to wear performance. Washing is one of the most important finishing treatments applied on apparels to produce special outlooks and improving the fashion. Technologically denim washing is the most important fashion element for clothing industry. Industrial washing is one of the most important applied finishing methods on fabric or apparel. Different washing methods can be applied in case of denim fabrics finishing. To achieve special outlook as well as to change the fashion, responsible washing methods are stone wash, sand wash, bleach wash & enzyme wash. The use of enzymes in textile industry is one of the most rapidly growing fields in industrial enzymologist. The enzymes used in the textile field are amylases, catalane, and lactase which are used to removing the starch, degrading excess hydrogen peroxide, bleaching textiles and degrading lignin.

1.3 Objectives of the thesis:

Textile is the most important area of earning foreign currency so it is essential to rapid development of washing technology of a company especially in Textile Company. Practical knowledge is more effective than academy knowledge and so it will fulfill the experience through theoretical as well as practically. The main objectives of this study-

- To evaluate the Garments washing process.
- To observe the different type of shade in this process.
- To find out some problems of critical wash.
- To compare between before wash garments and after wash garments.
- To matching the shade variation of same wash process.
- To limitation of critical wash process.

1.4 Importance of the thesis:

A combination between our general education line and practical life with various article, documents and calculation. A large number of foreign currencies are earned by garments and textile sector around 82% to 85%. The importance of this paper is to determine the different types of wash effect in denim garments. For this investigation currently fashionable regular denim (100% cotton with twill 3/1 weave construction) garments was chosen.

1.5 Scope of the thesis:

- Huge opportunities to do some things in denim washing industry.
- Nowadays the washing demand increasing day by day for production.
- RMG is given so much opportunity for developing new techniques of washing sector.
- It is an interesting topic so that almost all industry are giving chance for researching about washing process and wash effect to increasing productivity.

CHAPTER-2

LITERATURE REVIEW

2.0 Definition:

The technology which is used to modify the appearance, outlook comfort ability & fashion of the garments is called washing.

2.1 Denim:

Denim is the unique apparel preferred by all age groups and due to its popularity. Denim is a rugged cotton twill textile in which the weft passes under two or more warp threads. This twill weaving produce the familiar diagonal of the fabric, which distinguishes denim from cotton duck. Denim though considered being one of the oldest fabrics in the world yet remains fresh even today.

The warp yarn is traditionally dyed with the blue pigment obtained from indigo dye. Indigo was the most yarn is traditionally dyed with the blue pigment obtained from indigo dye. Indigo was the most significant natural dye known to mankind until the introduction of synthetic dyes, at the end of the 19^{th} century.

Fig 2.1: Denim fabric

Denim mills are now, more than at any time previously, spending large amounts of money in developing new concepts which in term means that all jeans manufactures will experiment with and achieve new levels of finishing.

2.1.1 Origin

The world denim comes from the name of a study fabric called serge, originally made in Nimes, France, by the Andre family. Originally called Serge de Nimes, the name was soon shortened to denim. Denim has been used in America since the late 18th century.

Denim was the traditionally colored blue with indigo dye to make blue "jeans",though "jean" then denoted a different lighter cotton textile; the contemporary use of jean comes from the French word for Genoa, Italy ,where the first denim trousers were made.

2.1.2 Object of washing:

There are several objects of denim garment washing:

1. **To develop softness in garments**: Size materials applied during manufacturing that are present in the fabric are removed, which enhances the soft hand feel. Additional softness may be attained by using softeners.

2. **To introduce a fading effect:** Dyes or pigments present in the fabric, used during colouration, are washed out locally or partially, resulting in fading or worn-out effects in the garments.

3. **To create new fashion:** The washing process of garments creates a different outlook (faded, colour tinted, etc.), thus creating new fashions for new generations especially for teenagers.

4. **To satisfy the consumer:** Because contraction or extraction (shrinkage) does not occur during washing, the wearer can use the garments satisfactorily after purchasing them.

2.1.3 Process Flow chart of Denim production:

Spinning

↓

Bale warping

↓

Rope dyeing

↓

Long Chain Beaming

↓

Sizing

↓

Weaving

↓

Finishing

↓

Inspection & Folding

↓

Packing

↓

Dispatch

2.2 Feature of Denim:

Typical denim fabrics are woven from coarse, indigo-dyed cotton yarn. They are hard wearing, high density fabrics with a high mass per unit area. Today, more denim is produced in the world than any other type of cloth. It is long term popularity has made it a fashion fabric in casual wear.

- Usually the warp is colored and theft is white
- It is a cotton –polyester blend, durable heavy weight, twill weave and yarn dyed fabric.
- It is warp-faced twill, the colored warp yarns predominate on the face and the white weft yarns on the back.
- It is available in different weight, rang- from 203.46gm/m^2 (6 oz/yd^2) to 474.74 gm/m^2 (14.6 oz/yd^2) or more in a 2/1 or 3/1 interlacing pattern.
- To control shrinkage, wrinkling commonly blended with spandex.

Fig 2.2: Right Hand Twill

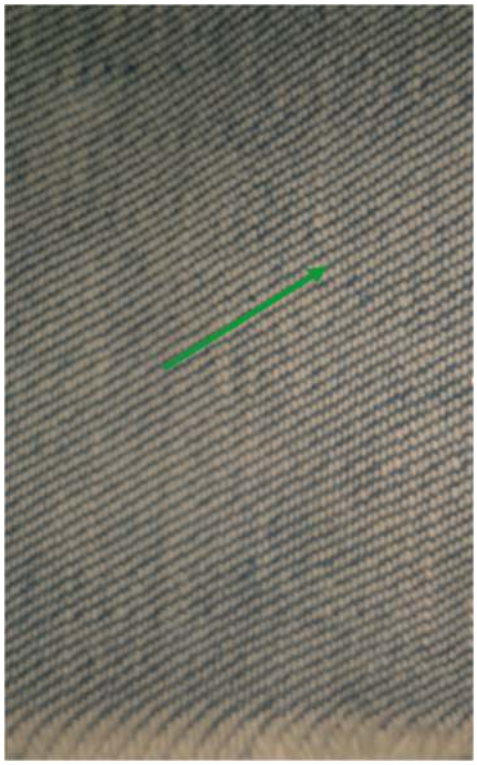

Fig 2.2.1: Left Hand Twill

The character of the diagonal surface texture. The twill line can follow upward to the right (right-hand twill) or upward to the left (left-hand twill) diagonal direction. All will function as a denim

fabric, but the width and angle of the diagonal line will change the more yarns floated over the shallower diagonal direction, the more pronounced the diagonal lines. The fewer yarns floated over, and the steeper the diagonal direction, the less noticeable the diagonal lines.

2.3 Types of denim fabrics:

2.3.1 Colored denim: colored denim fabrics are woven, manufacturing with dyed yarn either warp or weft. This kind of fabric can be obtained by piece dying process.

Fig 2.3.1: Colored denim.

2.3.2 Bubble gum denim: Bubble gum denim fabric is lycra containing denim, that has between 35% to 50% lycra or stretch.

Denim from fox fiber: This gum denim fabric is manufactured by colored cotton fiber that grows naturally developed and patented by California cotton breeder sally box.

Fig 2.3.2: Bubble gum denim

2.3.3 Crushed denim: In crushed denim fabrics. Textured effect achieved through a special fabric construction coupled with wet processing. Where the effect can also be improved by using stone and bleach. This kind of denim fabric is woven with a twist weft yarn.

Fig 2.3.3: Crushed denim

2.3.4 Vintage denim: To achieve old and worn outlook a denim treatment that applies heavy stone wash or a cellulose enzyme wash or without bleach is called vintage denim.

Fig 2.3.4: Vintage denim.

2.3.5 Ecru denim: Ecru denim fabric is that which is not having any dyed yarn, contains only grey yarn in warp an weft.

Fig 2.3.5: Ecru denim.

2.3.6 Marble denim: Marble denim has another name is acid wash. If the fabric is strongly bleached then it is called marble denim.

Fig 2.3.6: Marble denim.

2.3.7 Reverse denim: Reverse denim fabric is that, where the face side and reverse side lookalike.

Fig 2.3.7: Reverse denim.

Different between of denim and jeans:

SL No.	Denim	Jeans
01	Denim is a fabric and It is made from 100% cotton twill or stretch twill.	Jeans one kind of garments which is made by using denim fabric.
02	Denim fabric durable.	It is durable but dependent on how it was processed from denim fabric.
03	All denims are not jeans.	All jeans are denim.
04	Denim is fashionable fabric, by which different types of garments style can be produced.	Jean is only a particular style of garments.
05	Denim can be defined either jackets, shirt, skirts, pants, shorts etc.	Jean is specially defined at denim pant.

2.4 Denim washing:

Denim washing is the aesthetic finish given to the denim garment to enhance its appeal and provide strength. The emphasis is on comfort and softness. Fashion trends favour 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.

2.4.1 Available of garments washing techniques used in ADTL:

2.4.1.1 Dry process:

- Hand whisker.
- Hand scrapping.
- Resin (3D effect).
- Tagging.
- Grinding and destroy.
- P.P spray.
- Laser.

2.4.1.2 Wet process

- Normal wash.
- Desizing process.
- Enzyme wash.
- Stone enzyme wash.
- Bleach wash.
- Enzyme + stone+ Bleach wash.
- Acid wash.
- Pigment wash.
- Tinting.
- Random wash.
- Towel wash

2.4.2 Desizing:

Desizing is the process of removing the size material from the warp yarns after the textile fabric is woven. This is the most important part of denim washing.

During sizing, the warp yarn threads are treated with auxiliary chemicals known as sizing chemicals which impart the strength, friction resistance during weaving. The purpose of sizing is to protect the thread by coating. Different types of sizing chemicals are used like starch, modified starch, polyester, poly-acrylates, polyvinyl alcohol, polyvinyl acetate, CMC etc during washing, those chemicals must be removed to bring desired look on the fabric.

2.4.3 Bleach wash:

Bleach wash refers to light blue shade of denim. This Bleaching is usually out by strong oxidizing agents. In industry, most widely used chemicals are sodium hypo-chlorite, calcium hypo-chlorite, hydrogen per oxide and potassium permanganate.

Fig 2.4: Bleach wash

2.4.3 Enzyme wash: The Enzyme is a living biochemical substance and it works as a catalyst in the washing process. In the washing process at first step enzyme hydrolysis the cellulose and remove the projecting fibers from yarn, therefore faded effects are found by this wash. For getting proper fading effect on garments, enzyme wash is a most essential wash in the garment industry.

2.4.3.1 Objectives of enzyme wash:

- To remove the size materials from the denim garments.
- To achieve the high low abrasion on garment and seem abrasion in sewing area.
- To remove the present starch on the garments
- Enzyme attack as chemically not mechanically for this reason low damage/wastage then stone wash.
- To increase the color fastness & rubbing fastness.
- For soft feeling to wear the garment.
- Enzyme improves the anti-pilling properties.
- Enzyme attacks more the surface of the fabrics and gives a very smooth surface.

2.4.3.2 Types of enzyme:

Mainly two types of enzyme used in Bangladesh .Enzyme wash are –

1. Acid enzyme.
2. Neutral enzyme.
    a. Powder from.
    b. Liquid from i.e. SL enzyme.

2.4.3.3. Acid enzyme:

- Acid enzyme color is slightly brown.
- Enzyme effects come within short time.
- pH range is -4.5 to 5.5
- Temperature- 40^0c to 50^0c
- Time required 20 -30 min (according to shade).
- Staining occurs more in garments.

2.4.3.4. Neutral enzyme:

a) Powder from

- It is powder from.
- Effect comes slowly.
- Less staining on garments.
- p^H range is 6 to 7.
- Temperature-45^{0c} to 60^0 c.
- Time required 30 to 50 min (according to shade).

b) SL ENZYME:

- It is liquid from
- Effect comes slowly
- Less staining on garments
- pH range is 6 to 7
- Temperature 45 to 60 c.
- Time required 30 to 50 min (according to shade).

2.4.4. Acid wash:

An acid wash finish treatment create significant contrasts in the color of the denim material.it style came into vogue in 1980s, the process of treating denim in such a way began to become increasingly refined. Some tried to use a method similar to the stone washing, yet the fading did not occur as dramatically or throughout the material. Acid washed on apparel (phosphoric Acid is used in the process, acid would react with fabric surface and destroy the fabric) is washed with thermocol ball or pumice stone until it is bleach almost white. During acid wash, thermocol balls are used. By the action of thermocol ball or pumice stone. Irregular fading effect is develop on the heavy garments like denims, thick canvas /twill and sweater. The thermocol balls or pumice stones act a brushing action on the garment fabric surface is supersize your silhouette in this slouchy denim jacket in vintage acid wash. The area where more brushing action takes place less brushing action and takes place less fading effect will be developed. The multi-layer fabric areas like -collar, calf, pocket, placket and side seam etc. Area will be brushed more than the single layer areas. As a result irregular fading effect will be developed on the garments fabric surface. Thus in the way fading effect may be developed on the garment by acid wash technique.

2.4.4.1. Objectives of acid wash:

- To produce uneven fading shade or old looking effect.
- To get vintage look (that must be something new look).
- To achieve the buyer washing standard.
- To increase rubbing fastness.

2.4.4.2. Types of acid wash:

a Acid wash by stone.
b Acid wash by towel.
c Acid wash by cock-sheet.

2.4.4.3. Acid wash by stone:

At first pumice stones must be soaked by solution of strong oxidizing agents like sodium hypochlorite 5-10% (NaOCl) or potassium permanganate (KMbO4) (3-6%).Excess liquor is removed from the stones. Certain amount of treated stones and garments is dry tumbled in the garments is called acid washing or snow washing or ice washing, stones can be treated by two ways like-

1. Stones are taken into a net or mesh fabric and soaked into the solution then dried on air.
2. An excess piece of fabric is placed into the belly machine. Then stones are gathered on the fabric and the solution is sprayed on those stones and run the machine for 2-3 min by tumbling to remove excess solution and also to mix them properly.

KMn04 + h2O + H3P04 = Solution- Add stones → Soaking →

The soaked stones and wetted garments are loaded into the belly machine. According to the desired fading effect, the machine is tumbled 2-10 min. The degree of color fading depends on the belly machine. According to the desired fading effect, the machine is tumbled 2-10 min. The degree of color fading depends on the stone ratio, concentration of the chemicals, types of garments and dyestuffs .After getting the desired effect the garments are loaded on another machine for rinse for 3-4 min. As KMnO4 or NaOCl are hazardous chemical so neutralization is mandatory for further processing. If KMnO4 is used then MnO2 is formed which leads to brown /orange tone and must be removed by oxalic acid and if NaOCl is used then a reducing agent like sodium bi-sulfite is used for neutralization. Finally the garment treated with softener, hydro extracted and dried by dryer.

2.4.4.4. Towel wash: At present occasions, the most well-known denim pieces of clothing are irregular washed among the in vogue individuals. At the point when strong washed the blurring, impacts are even and uniform in the pieces of clothing however when arbitrary washed impacts are uneven. The initial step of corrosive wash is flush if necessary then desized by protein (alpha amylase) or by desizing synthetic compounds as indicated by the texture of the article of clothing. At that point wash by cellulosic proteins if necessary to bring scraped spot impacts. After those arbitrary wash strategies begin by making potassium permanganate (KMnO4) or dye (NaOCl) arrangement with required measure of water or phosphorous corrosive and uneven impact making components like stones, balls, towels, and thermopiles. To expedite irregular impacts articles of clothing must be wet so the pieces of clothing ought to be hydro removed before tossing to the midsection machine.

CHAPTER-3

EXPERIMENTAL DETAILS

3.0 EXPERIMENTAL DETAILS:

We were collected this report from Ananta Denim Technology Ltd. We completed report by following several process like desizing, enzyme, bleach, acid etc.

3.1 Buyer Requirement sheet

3.1 Enzyme wash

Ananta Denim Technology Ltd

Buyer name: Express

Quantity: 150

Fabric composition: 99% cotton, 1% spandex

ANANTA DENIM TECHNOLOGY LTD.

Washing Formula

Buyer:EXPRESS quntity:150 weight:80

Fabric composition: 99% cotton, 1% spandex

Wet Process										
Steps	Process	Water Ratio	Water Ltr.	Time(min)	PH	Chemical	Quantity	Dosage	Temp.	Remark
1	Desizing	1:07	560.00	10		dispersol mex	700	ml	50	out
						supralase 1200L	800	gm		
	Rinse	1:07	560						RT	
2	Enzyme	1:06	480	25		denzyme	400	gm	45	
						dispersol max	800	ml		
3	Biopolish	1:07	480	5						
						Lava cell NBG	500	ml		
						dispersol max	600	ml	50	
	Rinse	1:07	560						RT	
4	SOFTNER	1:06	480							
						softasil mic 4040	150	ml		
	Rinse 2×								RT	
5										

Enzyme wash

Ananta Denim Technology Ltd

Washing formula

Buyer: Express quntity:150 weight:80kg

Fabric composition: 99% cotton, 1% spandex

Wet Process										
Steps	**Process**	**Water Ratio**	**Water Ltr.**	**Time(min)**	**PH**	**Chemical**	Quantity	**Dosage**	**Temp.**	**Remark**
1	**Desizing**	**1:07**	**560.00**	**10**		**dispersol mex**	700	**ml**	**50**	**out**
						supralase 1200L	800	**gm**		
	Rinse	1:07	560						**RT**	
2	**Enzyme**	**1:06**	**480**	**25**		**denzyme**	400	**gm**	**45**	
						dispersol mex	800	**ml**		
3	**Biopolish**	**1:07**	**480**	**5**						
						Lava cell NBG	500	**ml**		
						dispersol mex	600	**ml**	**50**	
	Rinse	1:07	560						**RT**	
4	**SOFTNER**	**1:06**	**480**							
						softasil mic 4040	150	**ml**		
	Rinse 2×								**RT**	

Table 3.1 : Enzyme wash formula for 99% cotton ,1% spandex

Fig3.0: Before wash(sample)

Fig 3.1: After enzyme wash

Description: The table contains enzyme wash of denim washing for 99% cotton, 1% spandex. Firstly we did desizing process and we used dispersal mex and supralase 1200L with water. After desizing we used denzyme and dispersal mex with water for enzyme wash. Then we completed this wash by biopolish and softener. Finally we gave 2 times rinse. After rinse, Garments go through the hydro-extractor and dryer. At last we got the finished garments.

3.1.1 Enzyme wash

Ananta Denim Technology Ltd

Buyer name: Gap

Quantity: 150

Fabric composition: 70% cotton ,20%polyster ,8%ryon,2%spandex

ANANTA DENIM TECHNOLOGY LTD.

Washing Formula

Buyer:GAP quntity:150 weight:80

Fabric composition: 70% cotton, 20% polyester, 8% rayon, 2% spandex

Wet Process										
Steps	Process	Water Ratio	Water Ltr.	Time(min)	PH	Chemical	Quantity	Dosage	Temp.	Remark
1	Desizing	1:07	560.00	10		dispersol mex	700	ml	50	out
						supralase 1200L	800	gm		
	Rinse	1:07	560						RT	
2	Enzyme	1:06	480	25		denzyme	400	gm	45	
						dispersol max	800	ml		
3	Biopolish	1:07	480	5		Lava cell NBG	500	ml		
						dispersol max	600	ml	50	
	Rinse	1:07	560						RT	
4	SOFTNER	1:06	480			softasil mic 4040	2	L		
	Rinse 2×								RT	
5										

Enzyme wash

Ananta Denim Technology Ltd

Washing Formula

Buyer: GAP **quntity:150** **weight:80**

Fabric composition: 70% cotton, 20% polyester, 8% rayon, 2% spandex

Wet Process										
Steps	**Process**	**Water Ratio**	**Water Ltr.**	**Time(min)**	**PH**	**Chemical**	Quantity	**Dosage**	**Temp.**	**Remark**
1	**Desizing**	**1:07**	**560.00**	**10**		**dispersol mex**	700	**ml**	**50**	**out**
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	Rinse	1:07	560						**RT**	
2	**Enzyme**	**1:06**	**480**	**25**		**denzyme**	400	**gm**	**45**	
						dispersol mex	800	**ml**		
3	**Biopolish**	**1:07**	**480**	**5**						
						Lava cell NBG	500	**ml**		
						dispersol mex	600	**ml**	**50**	
	Rinse	1:07	560						**RT**	
4	**SOFTNER**	**1:06**	**480**							
						softasil mic 4040	2	**L**		
	Rinse 2×								**RT**	

Table3.1.1:Enzyme wash formula for 70% cotton,20%polyster,8% rayon ,2%spandex

Fig3.1.1: Before wash (sample)

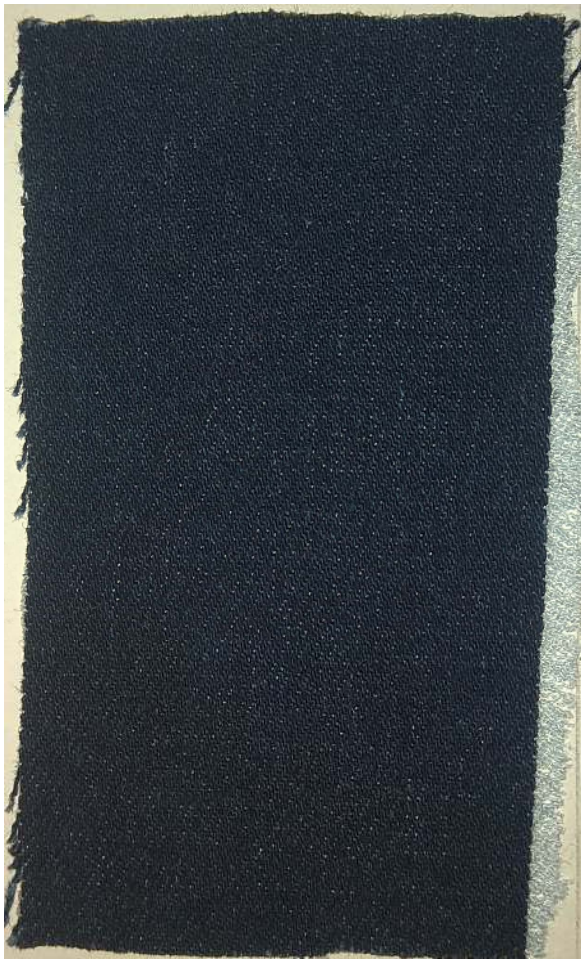


Fig 3.1.2: After enzyme wash

Description: The table contains enzyme wash of denim washing for 70% cotton,20%polyster ,8%ryon,2%spandex. Firstly we did desizing process and we used dispersal mex and supralase 1200L with water. After desizing we used denzyme and dispersal mex with water for enzyme wash. Then we completed this wash by biopolish and softener. Finally we gave 2 times rinse. After rinse, Garments go through the hydro-extractor and dryer. At last we got the finished garments.

3.2 Stone Enzyme wash

Ananta Denim Technology Ltd

Buyer name: Express

Quantity: 150

Fabric composition: 99% cotton, 1% spandex

ANANTA DENIM TECHNOLOGY LTD.

Washing Formula

Buyer:EXPRESS **quntity:150** **weight:80**

Fabric composition: 99% cotton, 1% spandex

Wet Process

Steps	Process	Water Ratio	Water Ltr.	Time(min)	PH	Chemical	Quantity	Dosage	Temp.	Remark
1	Desizing	1:07	560.00	10		dispersol mex	700	ml	50	out
						supralase 1200L	800	gm		
	Rinse	1:07	560						RT	
2	s/Enzyme	1:06	480	20		Lava cell NHC cold	500	gm	45	
						dispersol max	800	ml		
3	Biopolish	1:07	480	5						
						Lava cell NBG	500	ml		
						dispersol max	600	ml	50	
	Rinse	1:07	560						RT	
4	SOFTNER	1:06	480							
						softasil mic 4040	2	L		
	Rinse 2×								RT	
5										

Stone Enzyme wash

Ananta Denim Technology Ltd

Washing formula

Buyer: Express quntity:150 weight:80kg

Fabric composition: 99% cotton, 1% spandex

Wet Process										
Steps	**Process**	**Water Ratio**	**Water Ltr.**	**Time(min)**	**PH**	**Chemical**	Quantity	**Dosage**	**Temp.**	**Remark**
1	**Desizing**	**1:07**	**560.00**	**10**		**dispersol mex**	700	**ml**	**50**	**out**
						supralase 1200L	800	**gm**		
	Rinse	1:07	560						**RT**	
2	**Stone Enzyme**	**1:06**	**480**	**25**		**Lava cell NHC cold**	500	**gm**	**45**	
						dispersol mex	800	**ml**		
3	**Biopolish**	**1:07**	**480**	**5**						
						Lava cell NBG	500	**ml**		
						dispersol mex	600	**ml**	**50**	
	Rinse	1:07	560						**RT**	
4	**SOFTNER**	**1:06**	**480**							
						softasil mic 4040	150	**ml**		
	Rinse 2×								**RT**	

Table3.2: Stone enzyme wash formula for 99%cotton, 1%spandex

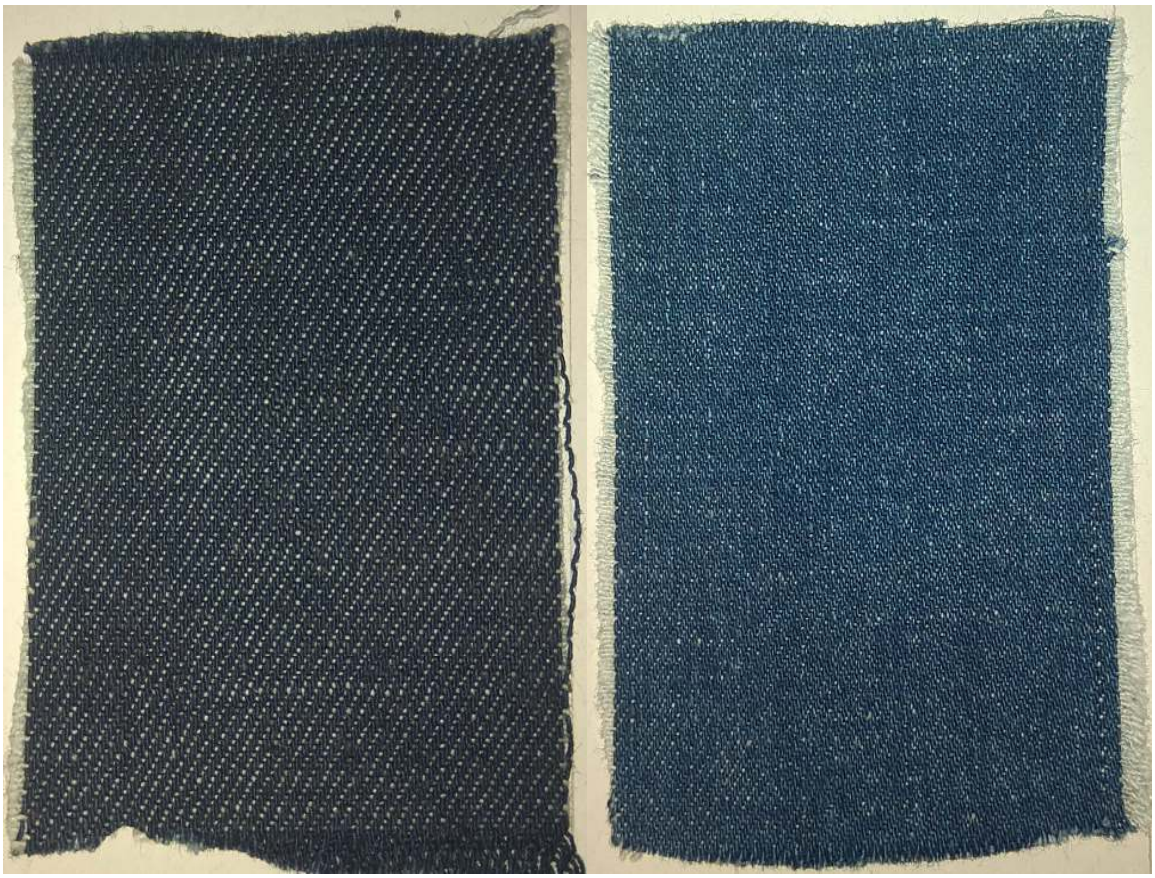


Fig3.2.1: Before wash

Fig3.2.2: After Stone Enzyme wash

Description: The table contains stone enzyme wash of denim washing for 99% cotton, 1% spandex. Firstly we did desizing process and we used dispersal mex and supralase 1200L with water. After desizing we used lava cell NHC cold, dispersal mex and 95-100kg stone with water for stone enzyme wash. Then we completed this wash by biopolish and softener. Finally we gave 2 times rinse. After rinse, Garments go through the hydro-extractor and dryer. At last we got the finished garments.

3.2.1 Stone Enzyme wash

Ananta Denim Technology Ltd

Buyer name: Gap

Quantity: 150

Fabric composition: 70% cotton, 20%polyster ,8% rayon,2%spandex

ANANTA DENIM TECHNOLOGY LTD.

Washing Formula

Buyer:GAP quntity:150 weight:80

Fabric composition: 70% cotton, 20% polyester, 8% rayon, 2% spandex

Wet Process											
Steps	Process	Water Ratio	Water Ltr.	Time(min)	PH	Chemical	Quantity	Dosage	Temp.	Remark
1	Desizing	1:07	560.00	10		dispersol mex	700	ml	50	out
						supralase 1200L	800	gm		
	Rinse	1:07	560						RT	
2	s/Enzyme	1:06	480	20		Lava cell NHC cold	500	gm	45	
						dispersol max	800	ml		
3	Biopolish	1:07	480	5						
						Lava cell NBG	500	ml		
						dispersol max	600	ml	50	
	Rinse	1:07	560						RT	
4	SOFTNER	1:06	480							
						softasil mic 4040	2	L		
	Rinse 2x								RT	
5										

Stone Enzyme wash

Ananta Denim Technology Ltd

Washing Formula

Buyer: GAP **quntity:150** **weight:80**

Fabric composition: 70% cotton, 20% polyester, 8% rayon, 2% spandex

Wet Process										
Steps	**Process**	**Water Ratio**	**Water Ltr.**	**Time(min)**	**PH**	**Chemical**	Quantity	**Dosage**	**Temp.**	**Remark**
1	**Desizing**	**1:07**	**560.00**	**10**		**dispersol mex**	700	**ml**	**50**	**out**
						supralase 1200L	800	**gm**		
	Rinse	1:07	560						**RT**	
2	**Stone Enzyme**	**1:06**	**480**	**25**		**Lava cell NHC cold**	500	**gm**	**45**	
						dispersol mex	800	**ml**		
3	**Biopolish**	**1:07**	**480**	**5**						
						Lava cell NBG	500	**ml**		
						dispersol mex	600	**ml**	**50**	
	Rinse	1:07	560						**RT**	
4	**SOFTNER**	**1:06**	**480**							
						softasil mic 4040	2	**L**		
	Rinse 2×						3		**RT**	

Table3.2.1: Stone wash formula for 70%cotton,20polyster,8% rayon ,2%spandex

Fig 3.2.1: Before wash

Fig3.2.2: After Stone Enzyme wash

Description: The table contains stone enzyme wash of denim washing for 70% cotton, 20%polyster ,8%ryon,2%spandex. Firstly we did desizing process and we used dispersal mex and supralase 1200L with water. After desizing we used lava cell NHC cold, dispersal mex and 95-100kg stone with water for stone enzyme wash. Then we completed this wash by biopolish and softener. Finally we gave 2 times rinse. After rinse, Garments go through the hydro-extractor and dryer. At last we got the finished garments.

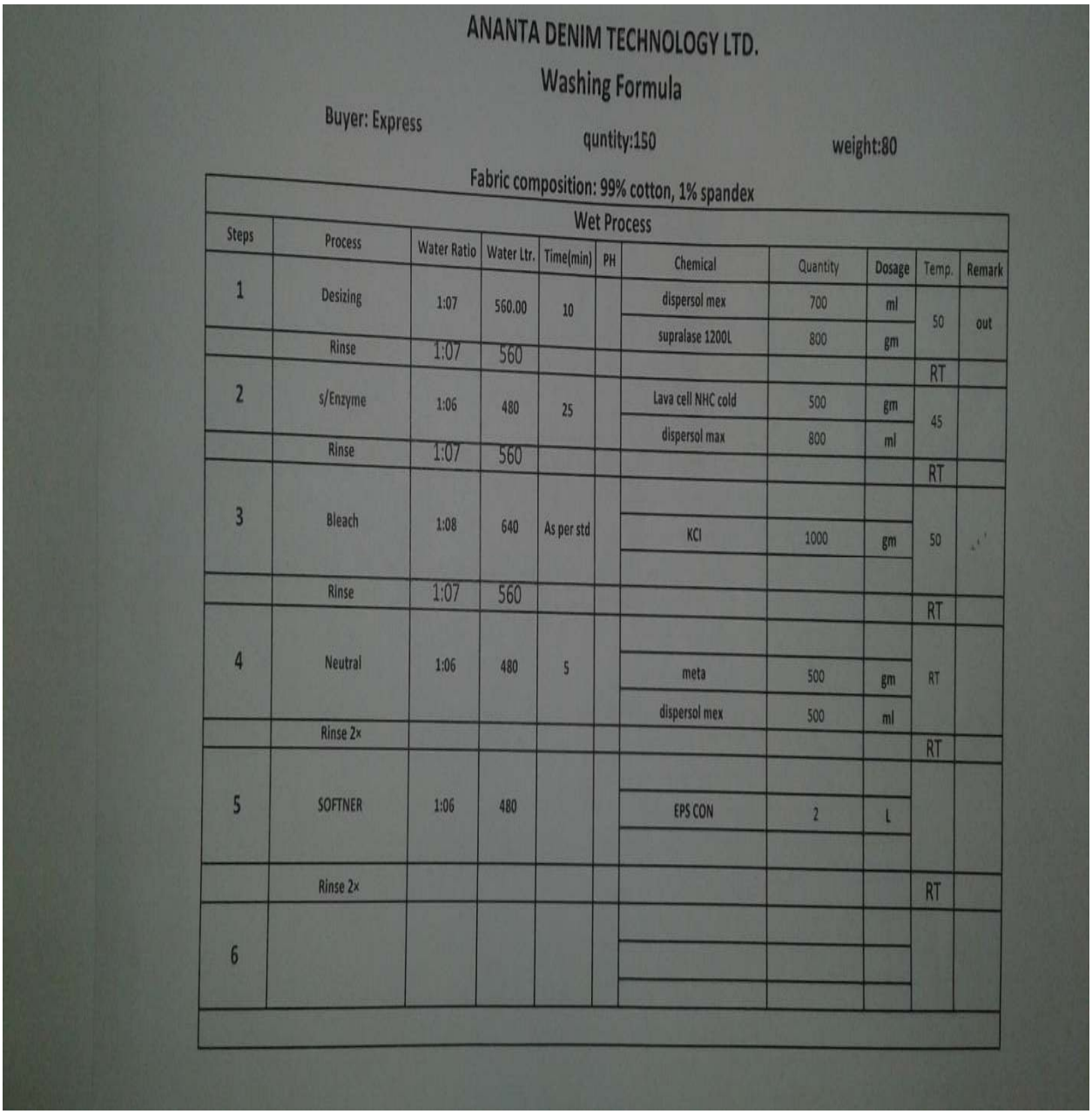
3.3 Bleaching wash

Ananta Denim Technology Ltd

Buyer name: Express

Quantity: 150

Fabric composition: 99%cotton ,1%spandex



ANANTA DENIM TECHNOLOGY LTD.

Washing Formula

Buyer: Express quntity:150 weight:80

Fabric composition: 99% cotton, 1% spandex

Wet Process

Steps	Process	Water Ratio	Water Ltr.	Time(min)	PH	Chemical	Quantity	Dosage	Temp.	Remark
1	Desizing	1:07	560.00	10		dispersol mex	700	ml	50	out
						supralase 1200L	800	gm		
	Rinse	1:07	560						RT	
2	s/Enzyme	1:06	480	25		Lava cell NHC cold	500	gm	45	
						dispersol max	800	ml		
	Rinse	1:07	560						RT	
3	Bleach	1:08	640	As per std		KCl	1000	gm	50	
	Rinse	1:07	560						RT	
4	Neutral	1:06	480	5		meta	500	gm	RT	
						dispersol mex	500	ml		
	Rinse 2×								RT	
5	SOFTNER	1:06	480			EPS CON	2	L		
	Rinse 2×								RT	
6										

Bleaching wash

Ananta Denim Technology Ltd

Washing Formula

Buyer: Express **quntity:150** **weight:80kg**

Fabric composition: 99% cotton, 1% spandex

Wet Process										
Steps	**Process**	**Water Ratio**	**Water Ltr.**	**Time(min)**	**PH**	**Chemical**	Quantity	**Dosage**	Temp.	**Remark**
1	**Desizing**	**1:07**	**560.00**	**10**		**dispersol mex**	700	**ml**	50	**out**
						supralase 1200L	800	**gm**		
	Rinse	1:07	560						RT	
2	**s/Enzyme**	**1:06**	**480**	**25**		**Lava cell NHC cold**	500	**gm**	45	
						dispersol mex	800	**ml**		
	Rinse	1:07	560						RT	
3	**Bleach**	**1:08**	**640**	**As per std**					50	
						KCl	1000	**gm**		
	Rinse	1:07	560						RT	
4	**Neutral**	**1:06**	**480**	**5**					RT	
						Meta	500	**gm**		
						dispersol mex	500	**ml**		
	Rinse 2×								RT	
5	**SOFTNER**	**1:06**	**480**							
						EPS CON	2	**L**		
	Rinse 2×								RT	

Table3.3: Bleach wash formula for 99% cotton, 1% spandex

Fig3.3.1: Before wash

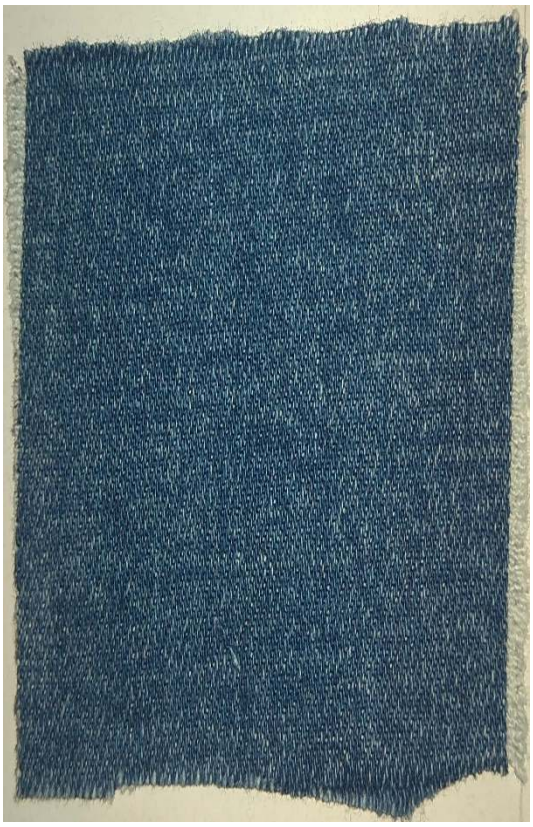


Fig3.3.2: After bleach wash

Description: The table contains bleach wash of denim washing for 99% cotton and 1% spandex. Firstly we did desizing process and we used dispersal mex and supralase 1200L with water. After desizing we used lava cell NHC cold, dispersal mex and 90kg stone with water for stone enzyme. After stone enzyme we did bleach by KCI(1kg). Then we done bleach neutral and 2 times rinse and we completed this wash by biopolish and softener. Finally we gave 2 times rinse. After rinse, Garments go through the hydro-extractor and dryer. At last we got the finished garments.

3.3.1 Bleaching wash

Ananta Denim Technology Ltd

Buyer name: Gap

Quantity: 150

Fabric composition: 70% cotton,20%polyster, 8%ryon ,2%spandex

ANANTA DENIM TECHNOLOGY LTD.

Washing Formula

Buyer: GAP quntity:150 weight:80

Fabric composition: 70% cotton, 20% polyester, 8% rayon, 2% spandex

Wet Process

Steps	Process	Water Ratio	Water Ltr.	Time(min)	PH	Chemical	Quantity	Dosage	Temp.	Remark
1	Desizing	1:07	560.00	10		dispersol mex	700	ml	50	out
						supralase 1200L	800	gm		
	Rinse	1:07	560						RT	
2	s/Enzyme	1:06	480	25		Lava cell NHC cold	500	gm	45	
						dispersol max	800	ml		
	Rinse	1:07	560						RT	
3	Bleach	1:08	640	As per std		KCl	1000	gm	50	
	Rinse	1:07	560						RT	
4	Neutral	1:06	480	5		meta	500	gm	RT	
						dispersol mex	500	ml		
	Rinse 2×								RT	
5	SOFTNER	1:06	480			EPS CON	2	L		
	Rinse 2×								RT	
6										

Bleaching wash

ANANTA DENIM TECHNOLOGY LTD.

Washing Formula

Buyer: GAP **quntity:150** **weight:80**

Fabric composition: 70% cotton, 20% polyester, 8% rayon, 2% spandex

Wet Process										
Steps	**Process**	**Water Ratio**	**Water Ltr.**	**Time(min)**	**PH**	**Chemical**	Quantity	**Dosage**	Temp.	**Remark**
1	**Desizing**	**1:07**	**560.00**	**10**		**dispersol mex**	700	**ml**	50	**out**
						supralase 1200L	800	**gm**		
	Rinse	1:07	560						RT	
2	**s/Enzyme**	**1:06**	**480**	**25**		**Lava cell NHC cold**	500	**gm**	45	
						dispersol mex	800	**ml**		
	Rinse	1:07	560						RT	
3	**Bleach**	**1:08**	**640**	**As per std**					50	
						KCl	1000	**gm**		
	Rinse	1:07	560						RT	
4	**Neutral**	**1:06**	**480**	**5**					RT	
						Meta	500	**gm**		
						dispersol mex	500	**ml**		
	Rinse 2×								RT	
5	**SOFTNER**	**1:06**	**480**							
						EPS CON	2	**L**		

Table3.3.1: Bleach wash formula for 70%cotton ,20%polyster,8%rayon ,2%spandex

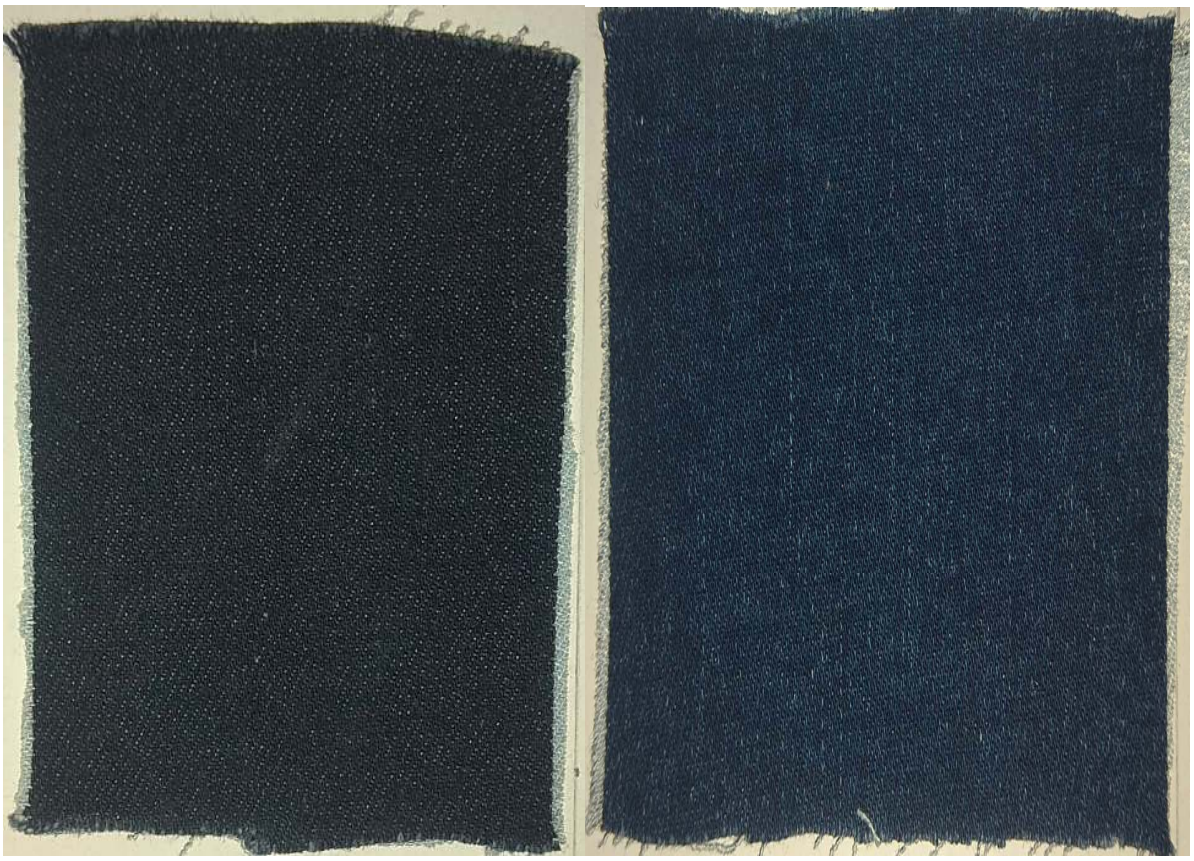


Fig3.3.3: Before wash

Fig3.3.4: After bleach wash

Description: The table contains bleach wash of denim washing for 70% cotton,20%polyster, 8%ryon ,2%spandex. Firstly we did desizing process and we used dispersal mex and supralase 1200L with water. After desizing we used lava cell NHC cold, dispersal mex and 90kg stone with water for stone enzyme. After stone enzyme we did bleach by KCI(1kg). Then we done bleach neutral and 2 times rinse and we completed this wash by biopolish and softener. Finally we gave 2 times rinse. After rinse, Garments go through the hydro-extractor and dryer. At last we got the finished garments.

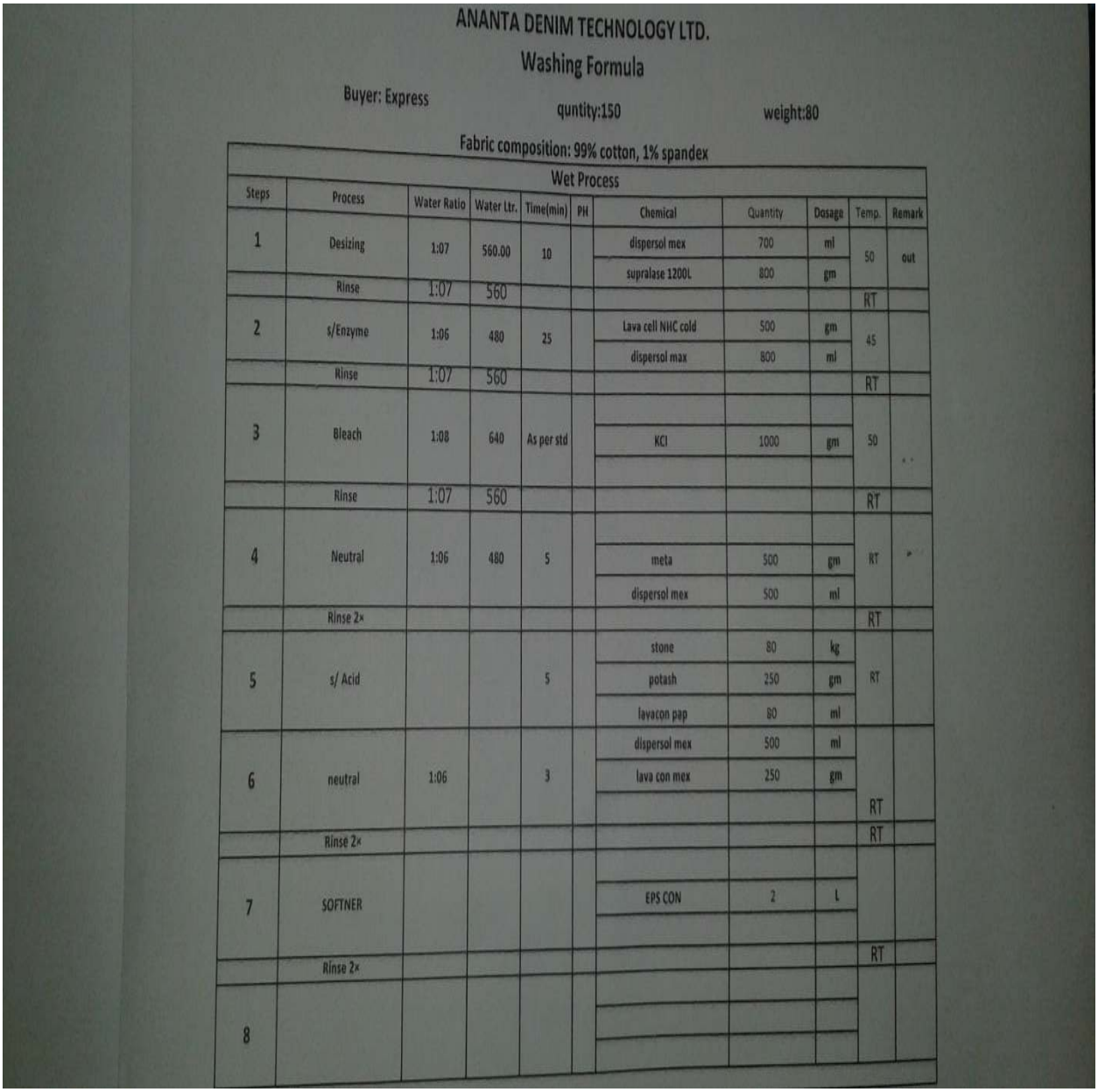
3.4 stone Acid wash

Ananta Denim Technology Technology Ltd

Buyer name: Express

Quantity: 150

Fabric composition: 99%cotton ,1%spandex



ANANTA DENIM TECHNOLOGY LTD.

Washing Formula

Buyer: Express quntity:150 weight:80

Fabric composition: 99% cotton, 1% spandex

Wet Process

Steps	Process	Water Ratio	Water Ltr.	Time(min)	PH	Chemical	Quantity	Dosage	Temp.	Remark
1	Desizing	1:07	560.00	10		dispersol mex	700	ml	50	out
						supralase 1200L	800	gm		
	Rinse	1:07	560						RT	
2	s/Enzyme	1:06	480	25		Lava cell NHC cold	500	gm	45	
						dispersol max	800	ml		
	Rinse	1:07	560						RT	
3	Bleach	1:08	640	As per std		KCl	1000	gm	50	
	Rinse	1:07	560						RT	
4	Neutral	1:06	480	5		meta	500	gm	RT	
						dispersol mex	500	ml		
	Rinse 2×								RT	
5	s/ Acid			5		stone	80	kg	RT	
						potash	250	gm		
						lavacon pap	80	ml		
6	neutral	1:06		3		dispersol mex	500	ml		
						lava con mex	250	gm		
									RT	
	Rinse 2×								RT	
7	SOFTNER					EPS CON	2	L		
	Rinse 2×								RT	
8										

stone Acid wash

Ananta Denim Technology Ltd

Washing Formula

Buyer: Express **quntity:150** **weight:80kg**

Fabric composition: 99% cotton, 1% spandex

Wet Process										
Steps	**Process**	**Water Ratio**	**Water Ltr.**	**Time(min)**	**PH**	**Chemical**	Quantity	**Dosage**	Temp.	**Remark**
1	**Desizing**	**1:07**	**560.00**	**10**		**dispersol mex**	700	**ml**	50	**out**
						supralase 1200L	800	**gm**		
	Rinse	1:07	560						RT	
2	**s/Enzyme**	**1:06**	**480**	**25**		**Lava cell NHC cold**	500	**gm**	45	
						dispersol mex	800	**ml**		
	Rinse	1:07	560						RT	
3	**Bleach**	**1:08**	**640**	**As per std**					50	
						KCI	1000	**gm**		
	Rinse	1:07	560						RT	
4	**Neutral**	**1:06**	**480**	**5**					RT	
						Meta	500	**gm**		
						dispersol mex	500	**ml**		
	Rinse 2×								RT	
5	**s/ Acid**			**5**		**Stone**	80	**kg**	RT	
						Potash	250	**gm**		
						lavacon pap	80	**ml**		
6	**Neutral**	**1:06**		**3**		**dispersol mex**	500	**ml**	RT	
						lava con mex	250	**gm**		
	Rinse 2×								RT	
7	**SOFTNER**									
						EPS CON	2	**L**		
	Rinse 2×								RT	

Table3.4: Stone Acid wash formula for 99% cotton, 1% spandex

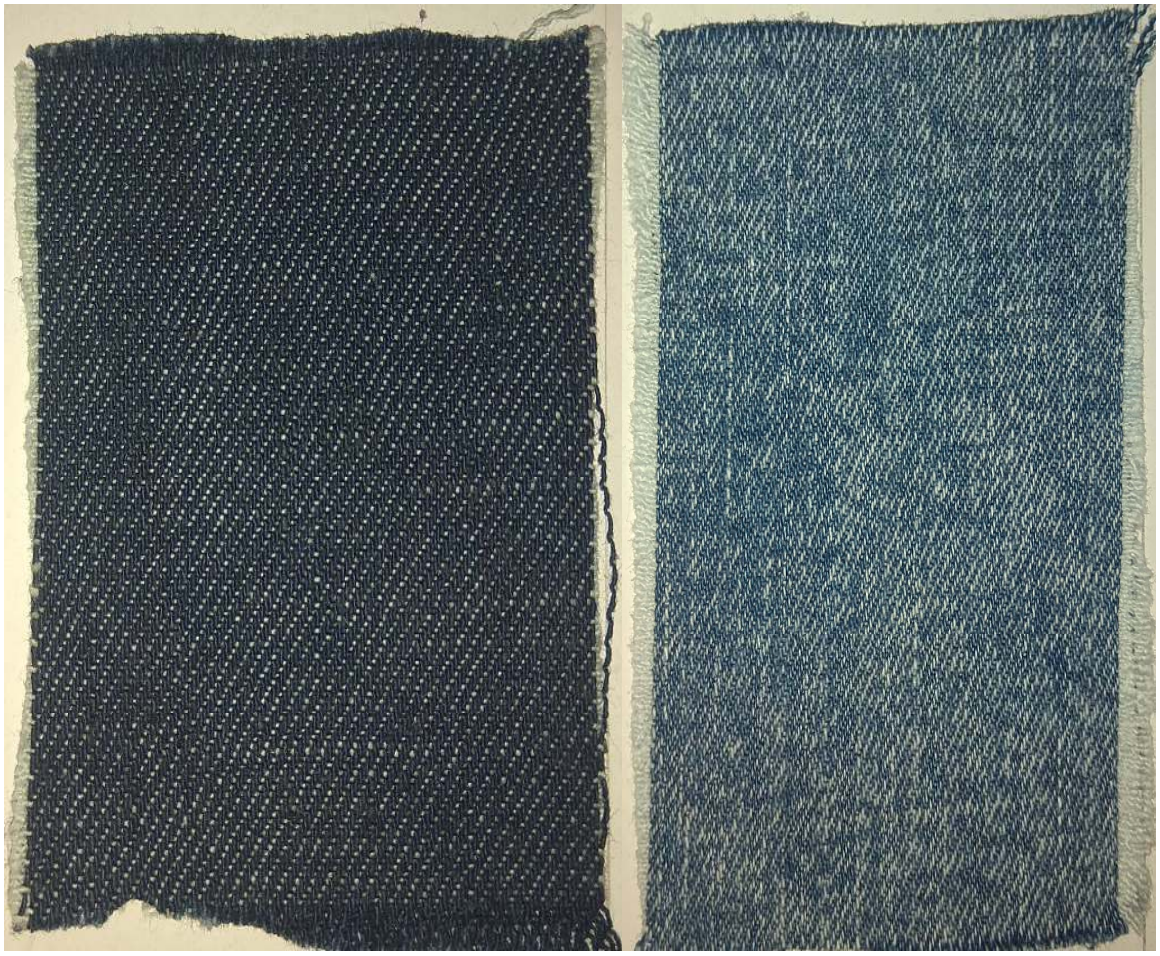


Fig 3.4.1: Before wash (sample)

Fig 3.4.2: Stone acid enzyme

Description: The table contains stone acid enzyme wash of denim washing for 99% cotton and 1% spandex. Firstly we did desizing process and we used dispersal mex and supralase 1200L with water. After desizing we used lava cell NHC cold, dispersal mex and 90kg stone with water for stone enzyme. After stone enzyme we did bleach by KCI(1kg). Then we done bleach neutral and gave 2 times rinse. After hydro and drying of the garments, then we were doing stone acid wash by stone, potash and lavacon pap. Then we did acid neutral by lava con mex and dispersal mex. we completed this wash by biopolish and softener. Finally we gave 2 times rinse. After rinse, Garments go through the hydro-extractor and dryer. At last we got the finished garments.

3.4.1 stone Acid wash

Ananta Denim Technology Ltd

Buyer: Gap

Quantity: 150

Fabric composition: 70%cotton ,20%polyster,8%rayon,2%spandex

ANANTA DENIM TECHNOLOGY LTD.

Washing Formula

Buyer: GAP quntity:150 weight:80

Fabric composition: 70% Cotton, 20% Polyester, 8% rayon

Wet Process

Steps	Process	Water Ratio	Water Ltr.	Time(min)	PH	Chemical	Quantity	Dosage	Temp.	Remark
1	Desizing	1:07	560.00	10		dispersol mex	700	ml	50	out
						supralase 1200L	800	gm		
	Rinse	1:07	560						RT	
2	s/Enzyme	1:06	480	25		Lava cell NHC cold	500	gm	45	
						dispersol max	800	ml		
	Rinse	1:07	560						RT	
3	Bleach	1:08	640	As per std		KCl	1000	gm	50	
	Rinse	1:07	560						RT	
4	Neutral	1:06	480	5		meta	500	gm	RT	
						dispersol mex	500	ml		
	Rinse 2×								RT	
5	s/ Acid			5		stone	80	kg	RT	
						potash	250	gm		
						lavacon pap	80	ml		
6	neutral	1:06		3		dispersol mex	500	ml	RT	
						lava con mex	250	gm		
	Rinse 2×								RT	
7	SOFTNER					EPS CON	2	L		
	Rinse 2×								RT	
8										

Stone Acid wash

Ananta Denim Technology Ltd

Washing Formula

Buyer: GAP **quntity:150** **weight:80**

Fabric composition: 70% Cotton, 20% Polyester, 8% rayon

Wet Process										
Steps	**Process**	**Water Ratio**	**Water Ltr.**	**Time(min)**	**PH**	**Chemical**	Quantity	**Dosage**	Temp.	**Remark**
1	**Desizing**	**1:07**	**560.00**	**10**		**dispersol mex**	700	**ml**	50	**out**
						supralase 1200L	800	**gm**		
	Rinse	1:07	560						RT	
2	**s/Enzyme**	**1:06**	**480**	**25**		**Lava cell NHC cold**	500	**gm**	45	
						dispersol mex	800	**ml**		
	Rinse	1:07	560						RT	
3	**Bleach**	**1:08**	**640**	**As per std**					50	
						KCl	1000	**gm**		
	Rinse	1:07	560						RT	
4	**Neutral**	**1:06**	**480**	**5**					RT	
						Meta	500	**gm**		
						dispersol mex	500	**ml**		
	Rinse 2×								RT	
5	**s/ Acid**			**5**		**Stone**	80	**kg**	RT	
						Potash	250	**gm**		
						lavacon pap	80	**ml**		
6	**neutral**	**1:06**		**3**		**dispersol mex**	500	**ml**	RT	
						lava con mex	250	**gm**		
	Rinse 2×								RT	
7	**SOFTNER**									
						EPS CON	2	**L**		
	Rinse 2×								RT	
8										

Table: 3.4.1: Stone acid wash formula for 70%cotton,20%polyster,8%rayon,2%spandex

Fig 3.4.3: Before wash(sample)

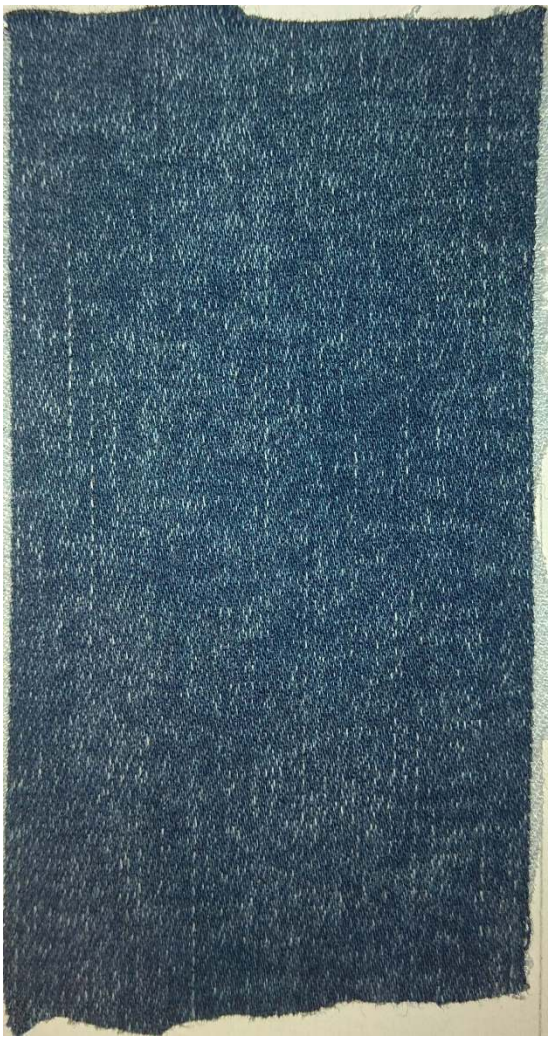


Fig3.4.4: After Stone acid wash

Description: The table contains stone acid wash of denim washing 70% cotton, 20%polyster, 8%rayon, 2%spandex. Firstly we did desizing process and we used dispersal mex and supralase 1200L with water. After desizing we used lava cell NHC cold, dispersal mex and 90kg stone with water for stone enzyme. After stone enzyme we did bleach by KCI(1kg). Then we done bleach neutral and gave 2 times rinse. After hydro and drying of the garments, then we were doing stone acid wash by stone, potash and lavacon pap. Then we did acid neutral by lava con mex and dispersal mex. we completed this wash by biopolish and softener. Finally we gave 2 times rinse. After rinse, Garments go through the hydro-extractor and dryer. At last we got the finished garments.

Chapter-4

RESULT AND DISCUSSION

4.0 Result and Discussion:

4.1 Analysis of enzyme wash on denim garments between two type of fabric composition, data from: 3.1 & 3.1.1

Chart 4.1 Analysis of before wash on denim garments

Chart 4.1.1 Analysis of enzyme wash effect on denim garments

Characteristics: For 99%cotton ,1%spandex

Before Enzyme wash

- Effect: Gray
- Shade : Dark.
- Tone: Blackish
- Handfeel: No
- Appearance: No slubs.

After Enzyme wash

- Effect: Blue
- Shade: Slightly change
- Tone: Bluish
- Handfeel: Slightly increase
- Appearance: Little portion slubs visible.
- Rejection:(2-3)%

Characteristics: For 70% Cotton, 20% Polyester, 8% rayon,2%spandex

Before Enzyme wash

- Effect: Gray
- Shade : Dark
- Tone: Blackish
- Handfeel: No
- Appearance: No slubs

After Enzyme wash

- Effect: Blue
- Shade: Slightly change
- Tone: bluish
- Handfeel: Slightly increase. But more than increase 99%cotton ,1% spandex garments enzyme wash.
- Appearance: No slubs
- Rejection:(2-3)%

4.2 Analysis of stone enzyme wash effect on denim garments between two type of fabric composition, data from: 3.2 & 3.2.

Chart 4.2 Analysis of before wash on denim garments

Chart 4.2.1 Analysis of stone enzyme wash effect on denim garments

Characteristics: For 99%cotton ,1%spandex

Before wash

- Effect: Gray
- Shade : Dark
- Tone: Blakish
- Handfeel: No
- Appearance: No slubs

After Stone Enzyme wash

- Effect: Blue
- Shade: Medium Light
- Tone: Bluish
- Handfeel: Slightly increase.
- Appearance: 10% slubs visible and it's more than normal enzyme wash.
- Rejection:(2-3)%

Characteristics: For 70% Cotton, 20% Polyester, 8% rayon,2%spandex

Before wash

- Effect: Gray
- Shade : Dark
- Tone: Blakish
- Handfeel: No
- Appearance: No slubs.

After Stone Enzyme wash

- Effect: Blue
- Shade: Slightly Light.
- Tone: Bluish
- Handfeel: 10% better than before wash and also 99%cotton ,1% spandex garments stone enzyme wash.
- Appearance: Little portion slubs visible.
- Rejection:(3-4)%

4.3 Analysis of bleach wash effect on denim garments between two type of fabric composition, data from: 3.3 & 3.3.1

Chart 4.3 Analysis of before wash on denim garments

Chart 4.3.1 Analysis of bleach wash effect on denim garments

Characteristics: For 99%cotton ,1%spandex

Before wash

- Effect: Gray
- Shade : Dark
- Tone: Blakish
- Handfeel: No
- Appearance: No slubs.

After Bleach wash

- Effect: Blue
- Shade: Light
- Tone: Yellowish
- Handfeel: Better than stone enzyme.
- Appearance: 30% slubs visible.
- Rejection: (3-4)%

Characteristics: For 70% Cotton, 20% Polyester, 8% rayon,2%spandex

Before Enzyme wash

- Effect: Gray
- Shade : Dark
- Tone: Blakish
- Handfeel: No.
- Appearance: No slubs.

After Enzyme wash

- Effect: Blue
- Shade: Moderate Light.
- Tone: Bluish
- Handfeel: 20% better than before wash and also 99%cotton ,1% spandex garments bleach wash.
- Appearance:10% slubs visible and it's more than stone enzyme wash.
- Rejection:(4-5)%

4.4 Analysis of stone acid wash effect on denim garments between two type of fabric composition, data from: 3.4 & 3.4.1

Chart 4.4 Analysis of before wash on denim garments

Chart 4.4.1 Analysis of stone acid wash effect on denim garments

Characteristics: For 99%cotton ,1%spandex

Before wash

- Effect: Gray.
- Shade : Dark.
- Tone: Blakish.
- Handfeel: No
- Appearance: No slubs.

After Stone Acid wash

- Effect: Marbelish
- Shade: More Light.
- Tone: Yellowish
- Handfeel: Good.
- Appearance: 40% slubs clearly visible.
- Rejection:(3-4)%

Characteristics: For 70% Cotton, 20% Polyester, 8% rayon,2%spandex

Before wash

- Effect: Gray
- Shade : Dark
- Tone: Blakish
- Handfeel: No
- Appearance: No slubs.

After Stone Acid wash

- Effect: Cross Hatch
- Shade: Light
- Tone: Bluish
- Handfeel: 30% better than before wash and also 99%cotton ,1% spandex garments stone acid wash.
- Appearance: 20% slubs visible & it's more than bleach wash.
- Rejection:(4-5)%

Chapter-5

CONCLUSION

5.0 Conclusion:

The aim of this paper was to observe the effects of different type of garments wash on denim apparel. For that purpose of denim pant or shirt were chosen as apparel. After washing changes on characteristics and shade variation of denim pant and shirt has been observed. After all of the washing process, the raw initial garments changed from hardness to softness characteristics. Due to some abrasion damage ends/inch and picks/inch of denim fabric has been decreased and as a result surface density of fabric decreased. After applied the wash process change all of the physical and chemical properties of denim pants or shirt i.e. tensile strength, tearing strength, p^h formaldyed etc. By this paper it will be possible to know how changed wash effect of denim shirts and pants by washing process.

Reference:

1) All data collected from the factory.
2) All informative information collect from the technical person.
3) Lecture sheet.
4) Denim Fabric Information.
5) Web: http://www.otdtextile.com , http://textilelearner.blogspot.com
6) Magazine: Textile Today, Textile Learner.