© UNIVERSAL RESEARCH REPORTS | REFEREED | PEER REVIEWED
ISSN : 2348 - 5612 | Volume : 05 , Issue : 06 | April – June 2018

Performance Assessment of Different Detergent Available in the Market on Different Parameters under Same Conditions

Pooja ,M. Tech Scholar
Dept. of Fashion Technology, BPSMV Khanpur Kalan Sonipat

Abstract :
In this present research study, analyse washing behavior and stain removal efficiency from cotton cloth by using laundr-o-meter. This study is designed to examine differences in effectiveness of laundering process for cleaning of cotton cloth by using laundro-meter using different chemical recipe (detergent ,enzymes and silicon) and check durability even after washing and regular wear.This study provide better methodologies for removing three types of stains like ketchup ,turmeric and grease stain from the cotton fabric by using laundro-meter. Laundry detergents are complex formulations incorporating a range of functional ingredients that may include: surfactants; buffers; chelating agents; enzymes; polymers; fragrances and optical brighteners. Their physical form has evolved from traditional powders through powder tablets, to liquid detergents and capsules, and the commercial marketplace is highly competitive, with consumers sensitive to both performance and price. Understanding the relative benefit of incorporating what can be expensive ingredients is crucial in formulation/product development, while exemplary QC is essential for long term market advantage. When it comes to assessing product performance there are a number of factors to consider. The issue of stain removal is clearly paramount with a range of different soils routinely tackled – from wine, chocolate and fruit juice through to oil/ grease, mud and blood. Effective cleaning relies in the first instance on removal of the soil from the fabric but preventing re-deposition is vital. Enzymes are used routinely to enhance soil breakdown, particularly for biological stains and for low temperature washing, while cellulosic/polymeric ingredients are often incorporated specifically to inhibit re-deposition. Laboratory performance tests for laundry detergents can fill important needs in laboratory development programs and in control testing, in which cases full scale practical testing is inapplicable. It has been found to be unnecessary and undesirable to attempt close simulation of practice conditions. In order to be most useful to the experimental investigator or the manufacturer of detergents the soil removal and whiteness retention properties should be measured by separate tests. This study represents that high temperature washing provides better cleaning.

Keywords: Stain .Detergent, Enzymes, Silicon, Laundro-Meter, Grey scale, Performance Assessment.

1. **Introduction:** Detergents and soaps are used for cleaning because pure water can't remove oily, organic soiling. Soap cleans by acting as an emulsifier. Basically, soap allows oil and water to mix so that oily grime can be removed during rinsing. Detergents were developed in response to the shortage of the animal and vegetable fats used to make soap during World War I and World War II.Detergents are primarily surfactants, which could be produced easily from petrochemicals. Surfactants lower the surface tension of water, essentially making it 'wetter' so that it is less likely to stick to itself and more likely to interact with oil and grease. Modern detergents contain more than surfactants. Cleaning products may also contain enzymes to degrade protein-based stains, bleaches to de-color stains and add power to cleaning agents, and blue dyes to counter yellowing. Like soaps, detergents have hydrophobic or water-hating molecular chains and hydrophilic or water-loving components. The hydrophobic hydrocarbons are repelled by water but are attracted to oil and grease. The hydrophilic end of the same molecule means that one end of the molecule will be attracted to water, while the other side is binding to oil. Neither detergents nor soaps accomplish anything except binding to the soil until some mechanical energy or agitation is added into the equation. Swishing the soapy water around allows the soap or detergent to pull the grime away from clothes or dishes and into the larger pool of rinse water. Rinsing washes the detergent and soil away. Warm or hot water melts fats and oils so that it is easier for the soap or detergent to dissolve the soil and pull it away into the rinse water.Detergents are similar to soap, but they are less likely to form films (soap scum) and are not as

© UNIVERSAL RESEARCH REPORTS | REFEREED | PEER REVIEWED
ISSN : 2348 - 5612 | Volume : 05 , Issue : 06 | April – June 2018

affected by the presence of minerals in water (hard water).Modern detergents may be made from petrochemicals or from chemicals derived from plants and animals. Alkalis and oxidizing agents are also chemicals found in detergents.

2) Objectives: The main objectives of the study are following:-

1. To know about detergents available in Market.
2. Study the cleaning mechanism of detergents
3. Performance Assessment on cotton fabric of Different Detergents.
4. Study the effect of Detergents over various parameters of clothes like tearing strength, creasing, wearing strength etc.

3) Material :The experiment is the vehicle to test the hypothesis. It is critical to develop a list of materials, constants and variables.

a) **Selection of material:** 3 types of Washing agents , Detergent (D1), Enzymes (E2) , Silicon (S3) sourced from Local market of Sonipat, (Haryana).

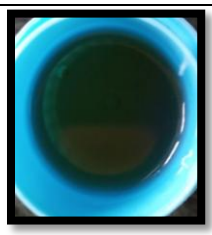
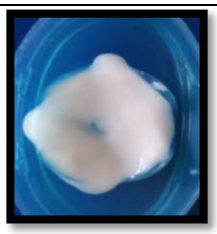
3 types of washing agents		
D1	**E2**	**S3**
		

Table : Three Types of washing detergent

b) Selection of fabric: Cotton fabric purchased from Local market of Sonipat, (Haryana).

Textile material(fabric)


Table :Textile Fabric

It is important to know the fiber content of the squares-100 percent cotton is standard. To achieve the best data for analysis, have multiple test squares for each step of your experiment. Be sure to keep several unstained squares to use for base comparison.

c) Selection of stain: Staining material katch-up , turmeric and grease purchased from local market of Sonipat . Unless you are testing how a laundry detergent(s) remove stains from different types of fabric, each test square should be identical in fabric type, size and weight.

3 types of staining material		
Katch-up	**Turmeric**	**Grease**

© UNIVERSAL RESEARCH REPORTS | REFEREED | PEER REVIEWED
ISSN : 2348 - 5612 | Volume : 05 , Issue : 06 | April – June 2018

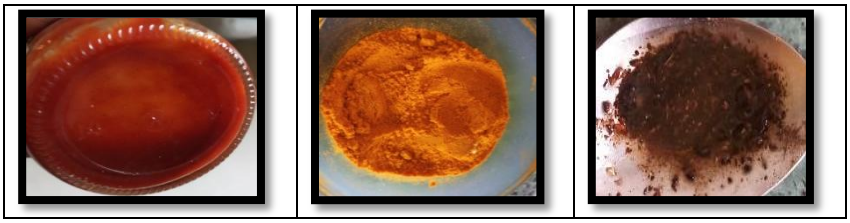


Table no : Three types of staining material

4 Results and discussion

Fig :washing behavior of stained cotton cloth with ketchup, turmeric and grease and washed with three types of washing agent detergent, enzymes and silicon.

4.1Data Analysis

a) Changes in GSM of cotton fabric after stain washing

The GSM of cloth has been found increased. It has been found that, the GSM increases after Detergent ,enzyme wash and by after silicone wash.

Sr.no	GSM			
	Before wash	After wash		
1	BW	DW	EW	SW
2	80 gm	76	78	79

Table : Effect on GSM of fabric after washing with different detergents

b)Changes in EPI and PPI of cotton fabric after stain washing

The EPI and PPI has been found increased. It has been found that, EPI and PPI increases after Detergent ,enzyme wash and by after silicone wash.. As the woven cotton fabric has a normal tendency to shrink more , that's why the EPI and PPI has been increased

Sr.no	EPI and PPI							
	Before wash		After wash					
1	BW		DW		EW		SW	
	EPI	PPI	EPI	PPI	EPI	PPI	PPI	PPI
2	82	52	88	56	85	54	83	53

Table : Effect on EPI and PPI of fabric after washing with different detergents

c)Changes in warp count and weft count of cotton fabric after stain washing

The warp count and weft count has been found increased. It has been found that, warp count and weft count increases after Detergent ,enzyme wash

and by after silicone wash. As the woven cotton fabric has a normal tendency to shrink more , that's why the warp count and weft count has been increased.

Sr.no	Warp and Weft count							
	Before wash		After wash					
1	BW		DW		EW		SW	
	Warp	weft	warp	weft	warp	weft	warp	weft
2	42	43.1	40	42	41	42	42	43

Table :Effect on warp count and weft count of fabric after washing with different detergents

d)Changes in tearing strength of cotton fabric after stain washing

The warp way tear strength has been found increased. It has been found that, the tearing strength increases after enzyme wash and by after enzyme- silicone wash. The weft way tearing strength is almost same in the different washing conditions. As the woven fabric has a normal tendency to shrink more in warp way, that's why the strength in the warp way has been increased.

Tearing strength(TS)					
Fabric type	Before wash		After after wash		
	Warp	Weft	Warp		Weft
Cotton	1.472kg	1.440kg	D W	1.842 kg	1.542kg
			E W	1.650 kg	1.490kg
			S W	1.550 kg	1.450kg

Table Effect on Tearing strength of fabric after washingwith different detergents

a) Changes in tensile strength of cotton fabric after stain washing

The strength has been found decreased . It has been found that, strength decrease after Detergent ,enzyme wash and by after silicone wash.

Fabric type	Before coating (BC)				After coating(AC)			
	Warp		Weft		Warp		Weft	
	Elongation In inch (EB)	Load kg (TS)	Elongation In inch (EB)	Load Kg (TS)	Elongation In inch (EB)	Load Kg (TS)	Elongation In inch (EB)	Load kg (TS)
BW	2.3	25	2.3	25.2	2	26.5	2.1	26
DW	1.8	20.3	2	23	1.5	20.9	2.1	22
EW	1.9	18	2	22	1.5	20.9	2.1	22
SW	1.3	16	1.40	20	1.25	18.2	1.30	16.3

Table: Effect on Tensile strength (TS) of stain washing on cotton (before washing and after washing) in warp and weft direction.

e)Changes in thickness of cotton fabric after stain washing

The thickness has been found decreased. It has been found that, thickness deincreases after Detergent ,enzyme wash and by after silicone wash.

Fabric type	Before Wash	After wash	
Cotton	0.21	D W	0.20

© UNIVERSAL RESEARCH REPORTS | REFEREED | PEER REVIEWED
ISSN : 2348 - 5612 | Volume : 05 , Issue : 06 | April – June 2018

		E W	0.19
		S W	0.21

Table: Effect on thickness of fabric after washing with different detergents

f)**Changes in stain wash fastness of cotton fabric after stain washing**

The stain wash fastness has been found increased and decreased . It has been found that, stain wash fastness increases and decrease after Detergent ,enzyme wash and by after silicone wash. As stain wash fastness depend on the type of stain and its tendency that's why the stain wash fastness has been increased and decreased and also determine the wash fastness rating via grey scale after washing in laundro-meter.

Stain wash fastness				
Fabric type	**Before Wash**	**After wash**		
		Stain	**Washing agent**	**Stain rating**
Cotton	Clean fabric	Katch-up	DW	5
			EW	4
			SW	3
		Termeric	DW	4
			EW	3
			SW	2
		Grease	DW	3
			EW	2
			SW	2

Table :Stain wash fastness rating via grey scale after washing with different washing agent

g)Changes in dimension stability of cotton fabric after stain washing

The lengthwise and widthwise dimension stability of cotton fabric has been found decreased. It has been found that, the dimension stability decreases after enzyme wash and by after enzyme- silicone wash. As the woven fabric has a normal tendency to shrink more in lengthwise and widthwise direction , that's why the dimension stability has been decreased.

Dimension stability					
Fabric type	**Before wash**		**After after wash**		
	Warp	**Weft**	**Washing agent**	**lengthwise**	**widthwise**
Cotton	8	6	D W	6	4
			E W	7	5
			S W	8	5

Table : Effect on table Dimension stability of fabric after washing with different washing agent

5.Conclusion: Procedure have been developed which permit the evalauation of different laundering processes for the removal of soiling . these procedure provide a means of quantitative effectives for cleaning of cotton fabric using specific methods of analysis.In present investigation synthetic soil and stains were applied on cotton cloth and then subjected to laundering to check their soil removal.Different techniques for assessing the removal of soils offer a range of qualitative and quantitative evalauation.In this study laundering process was evaluated and representive of a genric industrial laundering method.The launder-o-meter laundering process showed better removal of soiling

stain based on Grey scale colour/staining ratings and spectrophotometric measurements. While laundro-meter process failed to completely remove all soiling, there were observable difference for removal of the soils and stains from cotton cloth by laundrometer laundering process.The aim of ths study was to determine soil and stain removal efficiency of launder-meter .This was achieved by evaluated the performance of the washing machines upon laundering of samples.From the results obtained ,conclusion were drawn based on the objectives related to the performance of laundrometer. The results shows that ,high wash temperature removed the stains better than lower wash temperature .therefore it is accepted that lower wash temperature removed less stain and soil from the cotton cloth than high wash temperature. It was clear that the enzyme and enzyme- silicone washing imparts significant change in the fabric properties. The fabric weight (GSM) had been found increased up .The occurred shrinkage might had been the reason for this change in the fabric weight. After treating with silicone the weight had been found less than that of the enzyme washed sample.After stain washing, changes have been found in physical properties of cotton cloth,these changes concluded below:The GSM of cloth has been found increased. It has been found that, the GSM increases after Detergent ,enzyme wash and by after silicone wash. The EPI and PPI has been found increased. It has been found that, EPI and PPI increases after Detergent ,enzyme wash and by after silicone wash.. As the woven cotton fabric has a normal tendency to shrink more , that's why the EPI and PPI has been increased.The warp count and weft count has been found increased. It has been found that, warp count and weft count increases after Detergent ,enzyme wash and by after silicone wash. As the woven cotton fabric has a normal tendency to shrink more , that's why the warp count and weft count has been increased.The warp way tear strength has been found increased. It has been found that, the tearing strength increases after enzyme wash and by after enzyme- silicone wash. The weft way tearing strength is almost same in the different washing conditions. As the woven fabric has a normal tendency to shrink more in warp way, that's why the strength in the warp way has been increased.The strength has been found decreased . It has been found that, strength decrease after Detergent ,enzyme wash and by after silicone wash.The thickness has been found decreased. It has been found that, thickness deincreases after Detergent ,enzyme wash and by after silicone wash.The stain wash fastness has been found increased and decreased . It has been found that, stain wash fastness increases and decrease after Detergent ,enzyme wash and by after silicone wash. As stain wash fastness depend on the type of stain and its tendency that's why the stain wash fastness has been increased and decreased and also determine the wash fastness rating via grey scale after washing in laundro-meter.

The lengthwise and widthwise dimension stability of cotton fabric has been found decreased. It has been found that, the dimension stability decreases after enzyme wash and by after enzyme- silicone wash. As the woven fabric has a normal tendency to shrink more in lengthwise and widthwise direction , that's why the dimension stability has been decreased.

References

1. Desai (2002). Effect of laundering on the properties of cotton and polyester/cotton. NCM., 49: 25-30.
2. Jacob, M. (1998). Choice of detergents by three income group of consumers. Indian Textile & Trade J., 36: 48-51.
3. Desai (2002). Effect of laundering on the properties of cotton and polyester/cotton. NCM., 49: 25-30.
4. Jacob, M. (1998). Choice of detergents by three income group of consumers. Indian Textile & Trade J., 36: 48-51.
5. K.J. Palmer, J.A. Galvin The molecular structure of fibers made from native egg albumin, J. Am. Chem. Soc, 65 (1943), pp. 2187-219 M.L. Anson The sulfhydryl groups of egg albumin,J. Gen. Physiol., 24 (1941), pp. 399-421
6. C.B. Jones, D.K. Mecham The dispersion of keratins. II. Studies on the dis-persion of keratins by reduction in neutral solutions of protein dénaturants, Arch. Biochem., 3 (1943), pp. 193-202
7. .P. Flesch, E. Kun A colorimetric method for determination of sulfhydryl groups in tissue homogenates by l-(4-chloromercuriphenylazo)-Naphthol-2, ProSoc. Exp. Biol. & Med., 74 (1950), pp. 249-251
8. J.L. Stoves, The reactivity of the cystine linkage in keratin fiber. I. The action of alkalies, Trans Faraday Soc, 38 (1942), pp. 254-261 B. Chtego, H. Silver
9. The effect of alkalies on the stability of keratins, J. Invest. Dermat., 5 (1942), pp. 95-1037.
10. Van Scott, E.J., Flesh, P.: To be published 8. Y. Okuda Quantity of cysteine in living

tissue proteins and its biological significance,Proc. Imp. Acad. Jap., 5 (1929), p. 2469.