

OVER 100 YEARS



beepee
group

IN TEXTILES




The Magic Fabric







Dear Valued customer,

We are proud to present to you the revolutionary new fabric **beepee**  which has changed the face of the hospitality industry.

It is **A NEW AGE FABRIC WHICH RESOLVES AN AGE OLD CONFLICT.**

The age-old conflict: durability versus softness, color fastness versus absorbency, and soil release versus pilling performance. The choice was an either or proposition. For one set of characteristics use polyester, and for the other cotton. With the introduction of **beepee**  choice has become even simple - **one fabric that satisfies all demands.**

We hope this effort of ours will serve as a valuable tool to help you understand better the uniqueness of the **beepee**  fabric.

We request you to please take time and familiarize yourself with the information at hand. In the later half of the book we have made an effort to identify common problems & provide troubleshooters for the same.

Please feel free to contact our sales team at +91 -22 -22401213 or
Email at : sales@beepeegroup.com

Thanking You,

Chandra Kishor Poddar



Satin Band Damask



Napkins



Duper Jet



R&L Napkin



Diamond



Company Profile

Men Who Matter ...



Mr. Chandrakishor Poddar is a brilliant administrator. His ideas have proven to bring in success & prosperity to the group. He is the brain behind the launch of Home textiles. His vast experience of over 35 years in the field of textiles has proven worthwhile.



Mr. Anup Poddar looks after developing new markets and sales for the group. His forte includes conceptualizing new sales strategies and has an experience of over 15 years in this field.



Mr. Anil Poddar is playing a pivotal role in research & developing of various fabrics, finishes & designs. He is a master at quality control & innovations. He has been the force behind setting up the state of art plant of home textile products.



beepee enterprise pvt.ltd.

beepee Group has been in the textile business for over 100 years and our guiding philosophy has been to provide our clients the best quality at a competitive market price. Our never ending search for excellence has resulted in us winning the world wide international BID award for quality control.

beepee Group's vast clientele includes big names from hospitality industry, which includes major luxury and deluxe hotels, hospitals and major airlines across the globe. We are one of the largest suppliers of bed sheets, table cloths and table linen to these institutions. Apart from these, we also manufacture Uniform fabric Curtains, duvets that reflect quality.

Keeping an eye on the environmental concerns of the new millennium we at beepee have developed & introduced a completely new Eco friendly range of products.

Keeping in mind the discerning taste of your clients we have also introduced 100% certified organic cotton in our range. Cotton which has been cultivated without the use of any chemicals fertilizers and pesticides taking great pains by a selected team of Indian farmers and scientists and has been duly tested and certified to be free of any harmful chemicals from the only authorised international body in Europe.

We have also recently launched a new range which are microbe-free. The microorganisms like bacteria, fungi, algae and yeasts which grow in favorable conditions like dirt, fibre, warm temperatures, humidity, perspiration, spills, skin etc. Can lead to odour and health hazards leading to several diseases and infections. These are eliminated in our above range of products. Thus, we say "We protect the Products that Protect you."

We can also offer fire-retardant and Water-repellent fabrics.



We have been exporting to Middle East, Europe, South East Asia and Australia and have set our sing on new global markets.

We are always on the lookout to improving the quality.

We specialize in customizing our products as per your requirements.

Our Motto is "if you don't find it elsewhere you get it here".



We are the only manufacturer for a product like  in India - from developing the fabric to perfecting its performance, is synonymous with spun polyester. We are not a filament polyester producer trying to save market share. We are not a cotton house trying to buttress and antiquated fiber. **beepee** manufactures  because we believe, as do our customer, that it satisfies, every requirement of the end user. From feel to colorfastness.....

The **beepee**  fabrics are the fabrics for the years to come.

We are an Oeko tex Certifide Company, which gives a certificate to our commitment of not using the harmful chemicals in textile & maintain the products eco friendly.



Analysis



Cotton

Strength	Weakness
<ul style="list-style-type: none">• Soft hand (feel)• Absorbent• Traditional	<ul style="list-style-type: none">• Difficult to Process• Fades Easily• Lasts only about 60-80* washes• Launderings Hazards• Poor Shrinkage• Lints

Blends

Strength	Weakness
<ul style="list-style-type: none">• More durable than Cotton• Less fading than Cotton	<ul style="list-style-type: none">• Cotton washes out Leaving shiny polyester• Life of 120-140* Washings• Fading• Shrinkage• Lints• Poor appearance

Filament Polyester

Strength	Weakness
<ul style="list-style-type: none">• Colorfastness (Resist Fading)• Easy porcessing• Good durability• Good soil release• 200 + washes	<ul style="list-style-type: none">• Poor hand (Softness)• Poor absorbency• Picks and snags• Its unpleasant Appearance

* under normal water washing conditions.





Strength

92% as absorbent as cotton

Feel and look of cotton & blends

Durability of filament polyester

Color fastness of filament polyester

Will not lint or shrink like cotton or blends

Will not pick or snag like filament polyester

Excellent soil release

Easy laundering

Inherent stain resistance properties

200 + washes*

Weakness

A new product

* under normal water washing conditions.



Cocktail Napkin



Satin Band



Chair Cover



Satin Stripe Duvet Cover Set



Super Jet & Stitchless wonder



Ivy Leaf

Recommended Uses

- ✓ Table Linens
- ✓ Serviettes (Napkins)
- ✓ Aprons
- ✓ Work wear Garments
- ✓ Overalls/Coveralls
- ✓ Delivery Uniforms
- ✓ Kitchen/Chef Wear
- ✓ Chair Covers
- ✓ Duvet Covers
- ✓ Sheets
- ✓ Pillowcases

10-1 Ivory Light	30-1 Salmon Peach Medium	50-1 Brick Dark	60-5 Mini Green S. dark
10-2 Beige Medium	30-2 Magnolia Light	50-2 Burgundy S. Dark	60-6 Olive Dark
10-3 Champagne Light	30-3 Apricot Medium	50-3 Wine S. Dark	60-7 Iceberg Dark
20-1 Lt. Yellow Medium	30-5 Deep Peach Medium	50-5 Red S. Dark	70-1 Lt. Blue Light
20-2 Lemon Medium	30-6 Lt. Apricot Light	50-6 Dark Red S. Dark	70-2 M. Blue Medium
20-3 Deep Gold Medium	40-1 Shell Pink Medium	50-7 Plum S. Dark	70-3 Dark Blue (S. Dark)
20-4 Old Gold Medium	40-2 Bright Pink Light	60-1 Dark Green S. Dark	70-5 Blue Medium
20-5 Gold Medium	40-3 Rose Dark	60-2 Mini Green Medium	70-6 Purple Dark
20-6 M. Gold Medium	40-4 Pink Medium	60-3 Green Dark	80-1 Grey Medium
White	90-1 Black S. Dark	60-4 Turquoise Dark	80-2 Blue Grey Medium

The Actual colour of the Fabric may vary a little from printed shade above.

The image shows a title page for a document. The top and bottom sections are white. A central horizontal band is blue and contains a repeating pattern of the word "Index" in a light blue, cursive font, tilted at an angle. Overlaid on this blue band is the title "Technical Data" in a large, white, sans-serif font, centered horizontally and split across two lines.

Technical Data



Open End





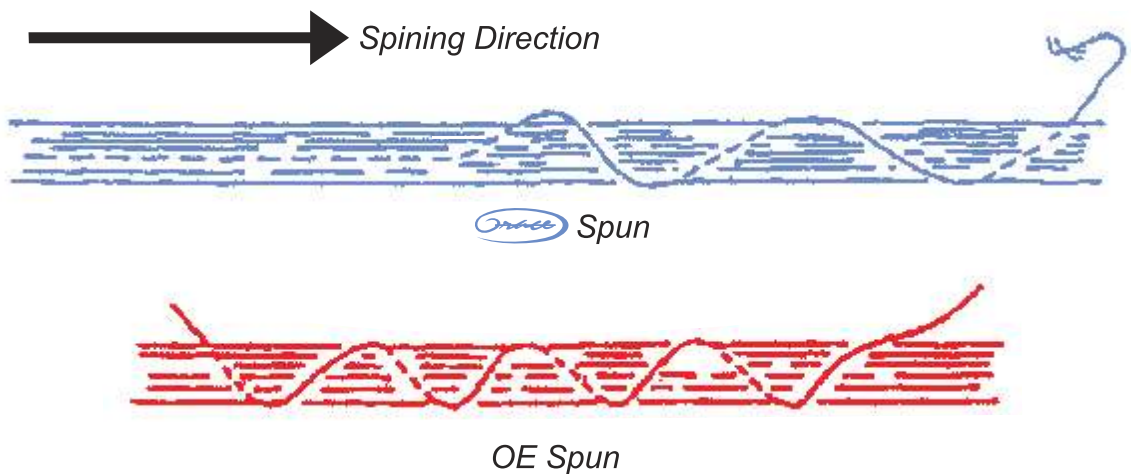
Ring




By a change in the spinning technology and directions we have different yarn characteristics.

Yarn Formation

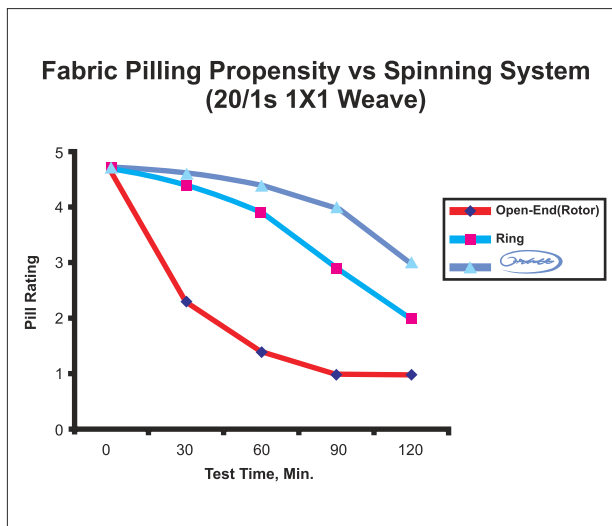
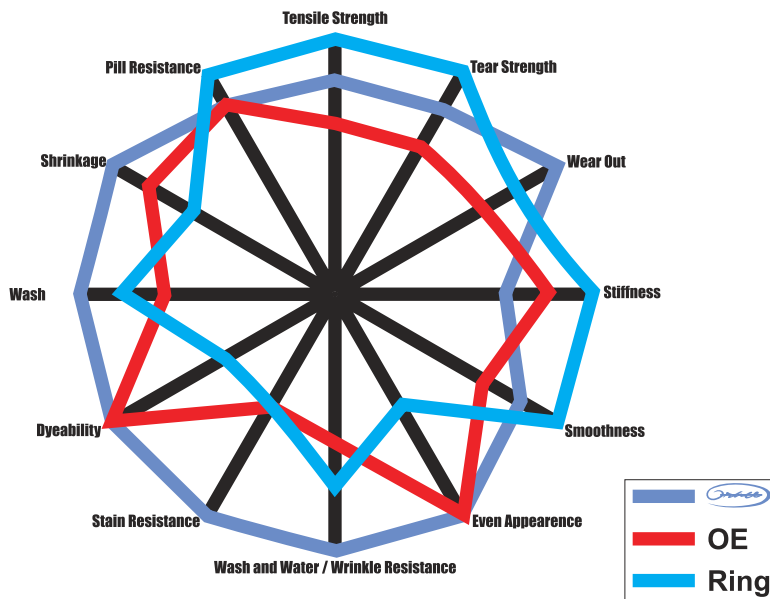
With  yarns, one open end of the wrapper fiber is usually imbedded in the core fibers, so as tension is placed on the yarn during spinning, the wrapper fibers is locked into place. With the Open-End yarn, both ends of the wrapper fibers are usually loose, which allows them to move freely, this one of the reasons  is better for pilling performance.




FABRIC QUALITY

Because of its better fiber orientation, wrapper fiber construction, and different twist construction,  will provide:


- Better tensile strength
- Better pilling resistance
- Better abrasion resistance




beepee Comparison of Performance Characteristics*

* Testing conducted by the International Institutes for the purpose of comparing the physical characteristics of  to 100% cotton and filament polyester. All tests were performed in an unbiased and independent environment.


WEIRECH'S ABSORBENCY

	Result
 3.1 in. 100% Cotton 3.4 in Filament Polyester 1.65 in	➤ 92% as absorbent as 100% cotton ➤ 75% more absorbent than filament polyester


ABRASION : ASTM D 3886

	Result
 843 cycles 100% Cotton 36 cycles Filament Polyester 288 cycles	➤ 23 times the life of 100% cotton ➤ 3 times the life of filament polyester


MACE SNAG : ASTM D 3939

	Result
 2.90 in 100% Cotton 5.00 Rating Filament Polyester 3.75 Rating	➤ 5 equals no snagging ➤ Equals to 100% cotton ➤ Ourperforms 100% cotton


PILLING RESISTANCE : ASTM D 3512

	Result
 5 Rating 100% Cotton < 2 Rating Filament Polyester 5 Rating	➤ 5 Equals no pilling ➤ Equal to filament polyester ➤ Outperforms 100% cotton


SHRINKAGE : AATCC 135

	Result
 1.64% 100% Cotton 5.9% Filament Polyester 1.65%	➤ 72% less shrinkage than cotton ➤ Virtually the same as filament polyester


TENSILE STRENGTH : ASTM D 5034

	Result
	
100% Cotton 267 lbs./in Filament Polyester 80 lbs./in Filament Polyester 191 lbs./in	➤ 3.3 Times the strength of 100% cotton ➤ 1.4 times the strength of filament polyester


TEAR STRENGTH : ASTM D 1424

	Result
	
100% Cotton 21 lbs./in Filament Polyester 6 lbs./in Filament Polyester 13 lbs./in	➤ 3.5 times the strength of 100% cotton ➤ 1.6 times the strength of filament polyester

STAIN RESISTANCE

	Result
 4.12 Rating 100% Cotton 2.98 Rating Filament Polyester 4.76 Rating	<ul style="list-style-type: none">➤ 5 Equals no staining - 10 food & oil stains➤ 28% less staining than 100% cotton➤ 87% as effective as filament Polyester

APPEARANCE RATING : AATCC 124

	Result
 3.5 Rating 100% Cotton 2.5 Rating Filament Polyester 3 Rating	<ul style="list-style-type: none">➤ 4 Equals top rating➤ 28% higher rating than 100% cotton➤ 15% higher rating than filament polyester



Marble Stone



Gup



Satin Band



RSA Napkin



Big Brocade



beep V/s Competition

beepee is the recognised leader in textile market with the presence of more than 100 years in textile industry.

beepee has always been ahead of its time and have always tried and come up with innovative products & designs to mesmerise the markets.

Our ISO 9001:2000 certification is a proof of our commitment towards Quality.

To further enhance the quality values and with the knowledge that all customers need protection against hazardous chemicals which are apartly in market products, we have also got Ockotex certification to prove that we do not use any hazardous chemicals in our product range. This would only enhance your peace in mind.

We being market leaders have always set the trend for other competitors to follow the path & standards to mantain.

The Quality and Quantity has been our forte.

Quality Construction

We use best quality of the long stape
Cotton fibre.

Uses short length

We use combed quality of yarn.

Uses carded yarn.

Thus inspite of having the same count / construction the quality is very different.
And can be normally judge by carrying out **TENSILE / BREAKING STRENGTH**
which result in dramatic changes is the number or washing cycles that the product
can take effectively

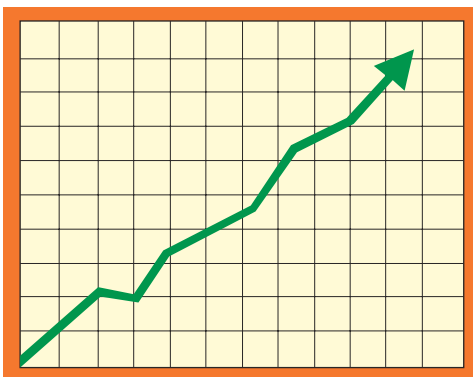
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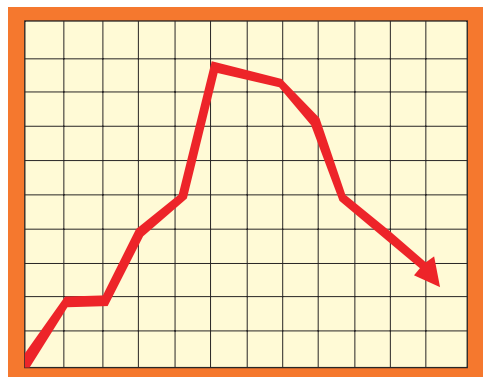
Suddenly the price does not look attractive as you have to replace the item twice as
many times.


Savings with

beepee 




Competitor



In a blind touch testing conducted through 3 hospitality exhibitions in 3 different continents. Out of 130 consumer consisting of house keepers, F & B, & laundry personnel 117 chose **beepee**  as the preferred fabric.





Survey

Survey Results

Question	Response									
1. Do you use spun Polyester?	Yes 96					No 34				
2. Which Weight?	Heavy 42		Medium 14		Both 18		Don't Know 22			
3. Do you mix with Blends etc.?	Blends 27		Cotton 2		Aprons 8		No 32			
4. Type washer? Weight? Load size?	open 900 900	open 900 840	open 900 800	open 900 720	open 900 700	open 800 560	open 800 800	open 675 600	open 600 625	
	open 600 600	open 550 410	open 450 520	open 450 450	open 450 400	open 450 375	open 450 360	open 450 315	open 400 400	
	open 300 300	open 275 200	open 250 225	open 135 100	open 125 125	tunnel				
5. Any mildew compared to Other napery?	Yes 10					No 86				
6. Temperature? Time in formula ? Ph in break chemicals?	165 90 13	175 85 10-11	180 75 11.5	170 65 9	150 62 12-13	160 60 ?	160 60 12.5	150 60 ?	150 60 11.5	165 58 58
	160 58 12.5	160 58 6	160 58 ?	120 58 11	160 56 ?	175 56 12.5	170 55 12	160 52 5.7	160 51 12.3	165 50 10.5
	160 50 9	150 50 ?	150 49 ?	165 48 ?	160 46 ?	160 45 12.5	160 45 11.4	180 45 ?	160 45 10.5	160 45 10.8
	150 45 ?	160 45 ?	180 42 11.5	160 38 11	160 35 ?	160(T) 28 11.5	170 20 ?			
7. Any Problem with Discoloration?	Yes 6 from mixing 4 fading					No 86				
8. Any problems with dimensional stability?	Yes 0					No 96				
9. Any problems with stretch ?	<u>Yes</u> 0					<u>No</u> 96				

Question	Response																																					
10. Which items napery, garments, aprons do You stock?	<table><tr><td colspan="2">Napery only</td><td colspan="2">44</td></tr><tr><td colspan="2">Napery and Aprons</td><td colspan="2">28</td></tr><tr><td colspan="2">Napery, Aprons & Garments</td><td colspan="2">12</td></tr><tr><td colspan="2">Aprons only</td><td colspan="2">4</td></tr><tr><td colspan="2">Napery & Garments</td><td colspan="2">4</td></tr><tr><td colspan="2">Garments only</td><td colspan="2">2</td></tr></table>						Napery only		44		Napery and Aprons		28		Napery, Aprons & Garments		12		Aprons only		4		Napery & Garments		4		Garments only		2									
Napery only		44																																				
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Aprons only		4																																				
Napery & Garments		4																																				
Garments only		2																																				
11. Have you made adjustments in extract?	<table><tr><td colspan="3"><u>Yes</u></td><td colspan="3"><u>No</u></td></tr><tr><td colspan="3">26</td><td colspan="3">64</td></tr></table>						<u>Yes</u>			<u>No</u>			26			64																						
<u>Yes</u>			<u>No</u>																																			
26			64																																			
12. Do you condition?	<table><tr><td colspan="3"><u>Yes</u></td><td colspan="3"><u>No</u></td></tr><tr><td colspan="3">24</td><td colspan="3">70</td></tr></table>						<u>Yes</u>			<u>No</u>			24			70																						
<u>Yes</u>			<u>No</u>																																			
24			70																																			
13. Have you experienced any stain removal or wash quality problems?	<table><tr><td colspan="2"></td><td colspan="2"><u>Yes</u></td><td colspan="2"><u>No</u></td></tr><tr><td colspan="2"></td><td colspan="2">22</td><td colspan="2">68</td></tr><tr><td colspan="2">Salad oil</td><td colspan="2">2</td><td colspan="2"></td></tr><tr><td colspan="2">lip stick</td><td colspan="2">2</td><td colspan="2"></td></tr></table>								<u>Yes</u>		<u>No</u>				22		68		Salad oil		2				lip stick		2											
		<u>Yes</u>		<u>No</u>																																		
		22		68																																		
Salad oil		2																																				
lip stick		2																																				
14. Percentage rejects compared to previous products?	<table><tr><td>100% less</td><td>2</td><td>50%less</td><td>10</td><td>40%less</td><td>2</td></tr><tr><td>20%less</td><td>2</td><td>5%-10%</td><td>8</td><td>Same</td><td>26</td></tr><tr><td>Lower</td><td>12</td><td>5%more</td><td>4</td><td>20% more</td><td>2</td></tr><tr><td>More</td><td>4</td><td>Don't know</td><td>4</td><td></td><td></td></tr></table>						100% less	2	50%less	10	40%less	2	20%less	2	5%-10%	8	Same	26	Lower	12	5%more	4	20% more	2	More	4	Don't know	4										
100% less	2	50%less	10	40%less	2																																	
20%less	2	5%-10%	8	Same	26																																	
Lower	12	5%more	4	20% more	2																																	
More	4	Don't know	4																																			
15. Did spun polyester increase productivity?	<table><tr><td colspan="3"><u>Yes</u></td><td colspan="3"><u>No</u></td></tr><tr><td colspan="3">42</td><td colspan="3">50</td></tr></table>						<u>Yes</u>			<u>No</u>			42			50																						
<u>Yes</u>			<u>No</u>																																			
42			50																																			
16. What finishing problems have you had, if any?	<table><tr><td colspan="2">None</td><td colspan="2">23</td></tr><tr><td colspan="2">Wrinkles</td><td colspan="2">8</td></tr><tr><td colspan="2">Extraction time</td><td colspan="2">6</td></tr><tr><td colspan="2">Clean and waxing ironer</td><td colspan="2">2</td></tr><tr><td colspan="2">Starch levels</td><td colspan="2">2</td></tr><tr><td colspan="2">Starch on ironer rolls</td><td colspan="2">1</td></tr><tr><td colspan="2">Sticking on ironer</td><td colspan="2">1</td></tr><tr><td colspan="2">Ironing</td><td colspan="2">1</td></tr></table>						None		23		Wrinkles		8		Extraction time		6		Clean and waxing ironer		2		Starch levels		2		Starch on ironer rolls		1		Sticking on ironer		1		Ironing		1	
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Starch on ironer rolls		1																																				
Sticking on ironer		1																																				
Ironing		1																																				
17. Customer reaction?	<table><tr><td colspan="2">Positive</td><td colspan="2">Negative</td><td colspan="2">Mixed</td></tr><tr><td colspan="2">38</td><td colspan="2">1</td><td colspan="2">7 (cotton replacement)</td></tr></table>						Positive		Negative		Mixed		38		1		7 (cotton replacement)																					
Positive		Negative		Mixed																																		
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Super Jet



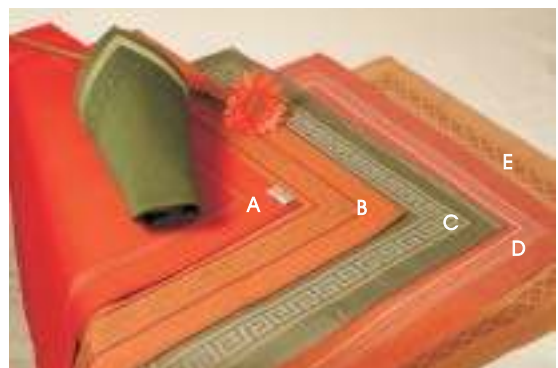
Napkins with Cocktail Napkins



Orchid



A - Dots Napkin



Napkins

Testing Report

TEXTILE TESTING LABORATORY REPORT

Company Name : Beepee Enterprise
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6th Floor, Mumbai -400 002, India.
Tel. : +91-22-22401213, 66331213, 66641213
Fax : +91-22-22409843
www.beepeegroup.com
E-mail : sales@beepeegroup.com

Subject : Reference To Three Fabric : White, Red, Yellow dots

Purpose Of Testing : To Determine The Physical Properties Of The Fabrics

Test Method : The three fabric pieces were commercially laundered ten cycles using the light color formula and tumble dried at 16°C. The fabrics were evaluated according to the following test methods :

- Tensile Strength ASTM D 5034
- Tear Strength ASTM D 1424
- Dimensional Stability AATCC 96
- Pilling Resistance (30 Minutes) ASTM D 3512
- Abrasion ASTM D 3886
- Soil Release AATCC 130
- Shrinkage AATCC 135
- Mace Snag ASTM D 3939
- Colorfastness (IA, IIA, IIIA, IVA) AATCC 61
- Colorfastness Rating AATCC Gray Scale for Color Change
- Bleeding/Staining AATCC 124
- Appearance AATCC 124
- Stain Resistance
- Weireck's Absorbency
- Chlorine Retention AATCC 92

IDENTIFICATION		WHITE - GRACE			
No. Of Cycles :	Orig.	1x	3x	5x	10x
Shrinkage % :					
Warp			2.9	3.2	5.1
Filling			0.5	0.8	1.5
Tensile Strength :					
(lbs/inch) Warp	315.5				263.0
Filling	219.2				185.3
Tear Strength :					
(Lbs/inch) Warp	23.9				11.7
Filling	18.9				9.2
Abrasion: No Of Cycles :	843				
Mace Snag : Warp					5.0
Filling					5.0
Pilling :					
Appearance Rating :			3.5	3.5	5.0
Chlorine Retention :	1.0%				3.5
(% loss/gain in strength)***	loss				
Weireck's Absorbency :					
Average absorbed					
In 10 minutes)					
Warp					2.9"
Filling					2.9"
Stain Resistance :					
1. Ketchup		5.0		5.0	5.0
2. Wine		3.5		5.0	5.0
3. Chocolate		3.3		4.3	4.3
4. Mayonnaise		2.0		2.5	2.8
5. Mustard		5.0		5.0	5.0
6. Grace Jelly		4.0		5.0	5.0
7. Oil		2.3		2.8	2.8
8. Lipstick		3.5**		3.5**	3.5**
9. Ink		1.8*		2.8*	2.8*
10. Coffee		4.5		5.0	5.0

Note : ** = % loss in tensile strength due to damage caused by retained chlorine.

IDENTIFICATION		FILAMENT COMPETITION			
No. Of Cycles :	Orig.	1x	3x	5x	10x
Shrinkage %:					
Warp			1.5	2.1	2.5
Filling			1.1	1.2	1.3
Tensile Strength:					
(lbs/inch) Warp	200.2				188.4
Filling	180.8				166.7
Tear Strength :					
(lbs/inch) Warp	13.3				11.7
Filling	13.3				9.2
Abrasion: No Of Cycles :	288				
Mace Snag : Warp	5.0				
Filling	5.0				
Pilling :					5.0
Appearance Rating :			3.5	3.5	3.5
Chlorine Retention :	1.3%				
(% loss/gain in strength)***	loss				
Weireck's Absorbency :					
Average absorbed in 10 minutes)					
Warp					1.2"
Filling					2.1'
Stain Resistance :					
1. Ketchup		5.0		5.0	5.0
2. Wine		4.3		5.0	5.0
3. Chocolate		5.0		5.0	5.0
4. Mayonnaise		5.0		5.0	5.0
5. Mustard		5.0		5.0	5.0
6. Grace Jelly		5.0		5.0	5.0
7. Oil		5.0		5.0	5.0
8. Lipstick		3.3**		3.8**	3.8**
9. Ink		2.5*		3.5*	3.8*
10. Coffee		5.0		5.0	5.0

Note : ** = % loss in tensile strength due to damage caused by retained chlorine.

IDENTIFICATION

Yellow Dots - GRACE

No. Of Cycles :		Orig.	1x	3x	5x	10x
Shrinkage %						
	Warp			2.9	3.2	3.5
	Filling			0.5	0.8	0.9
Tensile Strength :						
(lbs/inch)	Warp	319.7				266.0
	Filling	219.2				185.3
Tear Strength :						
(Lbs/inch)	Warp	23.9				11.7
	Filling	18.9				9.2
Abrasion: No Of Cycles :		663				
Mace Snag :	Warp	5.0				
	Filling	5.0				
Pilling :						
Appearance Rating :				3.5	3.5	5.0
Chlorine Retention :		4.3%				3.5
(% loss/gain in strength)***		gain				
Weireck's Absorbency :						
Average absorbed in						
(10 minutes)						
	Warp					2.7"
	Filling					2.4"
Stain Resistance :						
1.	Ketchup		5.0		5.0	5.0
2.	Wine		3.5		5.0	5.0
3.	Chocolate		3.5		4.3	4.8
4.	Mayonnaise		1.5		2.5	3.3
5.	Mustard		5.0		5.0	5.0
6.	Grace Jelly		5.0		5.0	5.0
7.	Oil		2.0		2.8	3.0
8.	Lipstick		3.8**		4.2**	4.2**
9.	Ink		2.0*		2.8*	2.8*
10.	Coffee		4.5		5.0	5.0

Note : ** = % loss in tensile strength due to damage caused by retained chlorine.

IDENTIFICATION

WHITE COTTON

No. Of Cycles :		Orig.	1x	3x	5x	10x
Shrinkage % :						
	Warp			5.0		6.1
	Filling			4.8		5.7
Tensile Strength :						
(lbs/inch)	Warp	89		79		73
	Filling	71		66		64
Tear Strength :						
(Lbs/inch)	Warp	6.8		6.4		6.2
	Filling	5.0		3.9		3.2
Abrasion :		301				
Mace Snag :	Warp	5.0				
	Filling	4.0				
Appearance Rating :				3.0		2.5
Weireck's Absorbency :						
	Warp	3.2"				
	Filling	3.6"				
Stain Resistance :						
1.	Ketchup			3.8		3.8
2.	Wine			3.5		3.5
3.	Mustard			4.5		4.5
4.	Grape Jelly			3.5		3.5
5.	Mayonnaise			2.5		2.0
6.	Lipstick			2.0		2.0
7.	Ink			1.0		1.0
8.	Coffee			3.5		3.5

IDENTIFICATION			RED			
No. Of Cycles :		Orig.	1x	3x	5x	10x
Shrinkage % :						
	Warp			4.1		5.3
	Filling			3.2		3.6
Tensile Strength :						
(lbs/inch)	Warp	103				
	Filling	52				
Tear Strength :						
(lbs/inch)	Warp	6.7				4.8
	Filling	3.5				2.8
Abrasion : No. Of Cycles		213				
Mace Snag :	Warp	5.0				
	Filling	4.0				
Appearance Rating:				3.0		3.0
Weireck's Absorbency :						
	Warp	3.4"				
	Filling	4.6"				
Stain Resistance :						
1.	Ketchup			3.4		4.0
2.	Wine			3.5		3.5
3.	Mustard			4.5		4.0
4.	Grape Jelly			3.0		2.5
5.	Mayonnaise			2.0		2.0
6.	Lipstick			2.0		2.0
7.	Ink			1.0		1.0
8.	Coffee			3.2		3.5

Test Data Summary

Sample identification :

Beepee GRACE

White Napkins

Test Method Dimensions, Inches Warp X Filling

	New	2 Washes	30 Washes	60 Washes	100 Washes
White 1	19.67 x 19.65	19.54 x 19.25	19.58 x 19.17		19.56 x 19.10
White 2	19.92 x 19.73	19.68 x 19.41	19.68 x 19.38		19.66 x 19.31
White 3	19.50 x 19.83	19.10 x 19.48	19.90 x 19.31		18.73 x 19.19
White 4	20.23 x 20.38	19.67 x 20.33	19.40 x 20.29		19.27 x 20.21
White 5	18.65 x 18.79	18.25 x 18.52	18.12 x 18.38		18.04 x 18.23

Weight, grams ASTM D 3776

	New	2 Washes	30 Washes	60 Washes	100 Washes
White 1	60.2	60	59.3		57.7
White 2	71.5	71.4	70.4		68.6
White 3	60.8	60.8	60.3		59.6
White 4	75.7	75.8	75.5		74.0
White 5	49.4	49.4	49.1		48.2

Wicking/Absorbency, Inches NIST-10-1, Sec 10

	New	2 Washes	30 Washes	60 Washes	100 Washes
White 1		2.5/2.7	2.0/2.0	2.3/2.5	2.2/2.1
White 2		1.5/1.5	1.9/2.0	2.3/2.5	2.3/2.4
White 3		1.8/1.6	2.5/2.3	2.9/3.0	2.6/3.1
White 4		3.0/2.8	2.3/2.0	2.7/2.6	2.2/1.9
White 5		1.3/1.5	2.3/1.7	3.4/2.7	2.8/2.2

Flex Abrasion (STOLL), cycle ASTM D 3885 (4) lb Tension, (1) lb Load

	New	2 Washes	30 Washes	60 Washes	100 Washes
White 1		2174x2316	1893x2015	1817x1492	1557x1487
White 2		2356x2614	2999x2506	1759x1799	1744x1907
White 3		5042x4025	5662x4645	4351x3363	4713x4062
White 4		5627x4967	5177x6110	3446x5376	3250x4358
White 5		6233x4967	5948x4612	3436x3377	5034x3377

Test Data Summary

Sample identification :

Beepee GRACE

White Napkins

Tensile Strength, lbs force ASTM D 5034 Grab Method Warp x Filling

	New	2 Washes	30 Washes	60 Washes	100 Washes
White 1		277x160	221x163		207x149
White 2		257x209	250x206		232x190
White 3		335x185	336x186		306x159
White 4		351x239	324x204		303x170
White 5		330x155	326x167		299x135

Yarn Number, ASTM D 1059 Short Length Method Warp x Filling

	New	2 Washes	30 Washes	60 Washes	100 Washes
White 1		14.6/1x14.4/1			
White 2		11.3/1x11.6/1			
White 3		33x506			
White 4		11.2/1x11.5/1			
White 5		336x361			

Pilling Resistance Random Tumble Method ASTM D 3512 30 min/60 min

	New	2 Washes	30 Washes	60 Washes	100 Washes
White 1		3.6/4.0	5.0/5.0	5.0/5.0	5.0/5.0
White 2		4.1/4.1	5.0/5.0	5.0/5.0	5.0/5.0
White 3		5.0/5.0	5.0/5.0	5.0/5.0	5.0/5.0
White 4		3.2/2.0	4.5/2.4	5.0/5.0	5.0/5.0
White 5		2.0/1.0	4.0/2.5	5.0/5.0	5.0/4.8

Stain Resistance ASTM D 4265

	New	2 Washes	30 Washes	60 Washes	100 Washes
White 1					
Red Wine		5.0	5.0	5.0	5.0
Mustard		3.8	4.0	4.3	4.0
Chocolate Syrup		5.0	5.0	5.0	5.0
Oil Base Salad Dressing		3.8	3.5	3.7	3.7

Test Data Summary

Sample identification :

Beepee GRACE

White Napkins

Stain Resistance ASTMD 4265

	New	2 Washes	30 Washes	60 Washes	100 Washes
White 2					
Red Wine		5.0	5.0	5.0	5.0
Mustard		3.8	4.0	4.3	4.0
Chocolate Syrup		5.0	5.0	5.0	5.0
Oil Base Salad Dressing		3.8	3.8	3.8	3.5
White 3					
Red Wine		5.0	5.0	5.0	5.0
Mustard		4.5	4.4	4.3	4.3
Chocolate Syrup		5.0	5.0	5.0	5.0
Oil Base Salad Dressing		4.5	4.9	5.0	5.0
White 4					
Red Wine		5.0	5.0	5.0	5.0
Mustard		3.8	4.4	4.2	4.3
Chocolate Syrup		5.0	5.0	5.0	5.0
Oil Base Salad Dressing		3.8	4.0	4.0	4.0
White 5					
Red Wine		5.0	5.0	5.0	5.0
Mustard		4.2	4.4	4.3	4.3
Chocolate Syrup		5.0	5.0	5.0	5.0
Oil Base Salad Dressing		3.8	4.2	4.2	5.0

Laundering (Wash down) AATCC Test Method 61

	New	2 Washes	30 Washes	60 Washes	100 Washes
White 1	5.0	5.0	5.0	5.0	4.5
White 2	5.0	4.5	4.5	4.5	4.5
White 3	5.0	5.0	4.5	4.5	4.5
White 4	5.0	5.0	5.0	5.0	5.0
White 5	5.0	4.5	4.5	4.5	4.5

Test Data Summary

Sample identification :

Beepee GRACE

White Napkins 1/2/3/4/5

Test Method Fabric Hand AATCC Procedure # S

	New	2 Washes	30 Washes	60 Washes	100 Washes
White 1					
Pliable	5.0	6.0	6.5	7.0	7.5
Soft	5.0	6.5	7.0	7.5	8.0
Stretchy	1.0	1.0	1.0	1.0	1.0
Springy	5.0	5.0	5.0	5.0	5.0
Compact	9.0	9.0	9.0	9.0	9.0
Rough	7.0	6.0	5.0	4.5	4.0
Harsh	7.0	6.0	5.5	5.0	4.5
White 2					
Pliable	5.0	5.5	6.5	7.0	7.5
Soft	5.0	5.0	7.0	7.5	8.0
Stretchy	1.0	1.0	1.0	1.0	1.0
Springy	5.0	5.0	5.0	5.0	5.0
Compact	9.0	9.0	9.0	9.0	9.0
Rough	8.0	7.0	6.0	5.5	5.0
Harsh	8.0	7.0	6.5	6.0	4.5
White 3					
Pliable	5.0	6.5	6.5	7.0	8.0
Soft	5.0	6.5	7.0	8.0	9.0
Stretchy	1.0	1.0	1.0	1.0	1.0
Springy	5.0	5.0	5.0	5.0	5.0
Compact	9.0	9.0	9.0	9.0	9.0
Rough	6.5	5.0	4.5	4.0	3.0
Harsh	6.0	5.5	5.0	4.5	4.0

Test Data Summary

Sample identification :

Beepee GRACE

White Napkins 1/2/3/4/5

Test Method Fabric Hand AATCC Procedure # S

	New	2 Washes	30 Washes	60 Washes	100 Washes
White 4					
Pliable	5.0	5.5	6.0	6.5	7.0
Soft	5.0	6.0	7.0	7.0	7.5
Stretchy	1.0	1.0	1.0	1.0	1.0
Springy	5.0	5.0	5.0	5.0	5.0
Compact	9.0	9.0	9.0	9.0	9.0
Rough	8.0	7.5	7.0	6.5	6.0
Harsh	8.0	7.0	7.0	6.0	6.0

White5					
Pliable	5.0	6.0	6.5	7.0	7.5
Soft	5.0	6.0	7.0	7.5	8.5
Stretchy	1.0	1.0	1.0	1.0	1.0
Springy	5.0	5.0	5.0	5.0	5.0
Compact	8.0	9.0	9.0	9.0	9.0
Rough	8.0	7.5	7.0	6.5	4.5
Harsh	8.0	7.5	7.0	6.0	5.0

Snagging Resistance Mace Method ASTM D 3939 Length x Width

	New	2 Washes	30 Washes	60 Washes	100 Washes
White 1		4.5/4.5	4.5/4.5	4.5/4.5	4.5/4.5
White 2		4.5/4.5	4.5/4.5	4.0/4.0	4.5/4.5
White 3		4.5/4.0	4.0/4.0	3.5/3.0	3.5/3.5
White 4		4.5/4.5	4.5/4.5	4.5/4.5	4.5/4.5
White 5		4.5/4.0	4.5/4.0	4.5/4.0	4.5/4.0

Key to Pilling Ratings/Snagging :

Class 5-No Pilling/Snagging
 Class 4-Slight Pilling/Snagging
 Class 3-Moderate Pilling/Snagging
 Class 2-Severe Pilling/Snagging
 Class 1-Very Severs Pilling/Snagging

Key to AATCC Gray Scale Ratings :

Class 5-Negligible or no color alteration
 Class 4-Slight color change
 Class 3-Noticeable color change
 Class 2-Considerable color alteration
 Class 1-Much color alteration

Test Data Summary

Sample identification :

Beepee GRACE

Yellow dots Napkins

Test Method Dimensions, Inches Warp X Filling

	New	2 Washes	30 Washes	60 Washes	100 Washes
Yellow Dots 1	19.83x19.75	19.75/19.44	19.62/19.29		19.64x19.23
Yellow Dots 2	20.02x19.52	19.88/19.08	19.79/19.02		19.88x18.94
Yellow Dots 3	19.64x19.48	19.25/19.06	19.04/18.81		19.90x18.62
Yellow Dots 4	19.96x20.06	19.96/19.52	19.88/19.27		19.88x19.10
Yellow Dots 5	19.36x18.56	17.88/18.29	17.75/18.15		17.56x18.04

Weight grams ASTM D 3776

	New	2 Washes	30 Washes	60 Washes	100 Washes
Yellow Dots 1	64.5	64.4	63.0		60.6
Yellow Dots 2	74.8	74.4	73.1		70.4
Yellow Dots 3	60.9	60.8	60.1		59.0
Yellow Dots 4	73.2	73.0	71.9		69.4
Yellow Dots 5	52.9	52.8	52.1		50.7

Wicking/ Absorbency, Inches NIST-10-1, Sec 10

	New	2 Washes	30 Washes	60 Washes	100 Washes
Yellow Dots 1		2.4/2.5	2.5/2.7	2.7/2.9	2.8/2.8
Yellow Dots 2		2.4/2.5	3.0/3.1	3.2/3.2	3.2/3.2
Yellow Dots 3		2.3/2.5	3.6/3.9	3.7/4.0	3.6/3.9
Yellow Dots 4		3.2/3.0	2.7/2.7	2.0/1.8	2.7/2.4
Yellow Dots 5		2.5/2.3	3.6/3.6	3.9/3.7	4.1/3.9

P. Abrasion (STCLL), cycles ASTM D 3885 (4) lb Tension, (1) lb Load

	New	2 Washes	30 Washes	60 Washes	100 Washes
Yellow Dots 1		2577/1990	2488/2116	1878/2164	1629/1935
Yellow Dots 2		2373/2399	2265/2727	2139/2499	1476/2007
Yellow Dots 3		6012/4237	5888/4698	5613/3494	4532/3045
Yellow Dots 4		3672/4991	4349/4742	2964/3979	2561/3675
Yellow Dots 5		5329/3793	5328/3184	5841/2577	5146/2458

Test Data Summary

Sample identification :

Beepee GRACE

Yellow dots Napkins

Tensile strength, Ibs, ASTMD 5034 Grab Method Warp x Filling

	New	2 Washes	30 Washes	60 Washes	100 Washes
Yellow Dots 1		229/177	225/164		210/143
Yellow Dots 2		289/202	288/186		259/149
Yellow Dots 3		333/178	320/169		272/134
Yellow Dots 4		317/206	295/164		7/134
Yellow Dots 5		326/129	318/150		231/96

Yarn Number, ASTM D 1059 Short Length Method Warp x Filling

	New	2 Washes	30 Washes	60 Washes	100 Washes
Yellow Dots 1 cc	14.1/1x14.0/1				
Yellow Dots 2 cc	11.1/1x11.3/1				
Yellow Dots 3 den	339x510				
Yellow Dots 4 cc	11.2/1x11.4/1				
Yellow Dots 5 den	339x3423				

Pilling Resistance Random Tumble Method ASTM D 3512 30 min/60 min

	New	2 Washes	30 Washes	60 Washes	100 Washes
Yellow Dots 1		5.0/5.0	5.0/5.0	5.0/5.0	5.0/5.0
Yellow Dots 2		4.8/4.8	5.0/5.0	5.0/5.0	5.0/4.9
Yellow Dots 3		5.0/5.0	5.0/5.0	5.0/5.0	4.8/4.6
Yellow Dots 4		3.1/2.0	4.0/4.0	4.9/5.0	5.0/5.0
Yellow Dots 5		5.0/3.9	5.0/5.0	5.0/5.0	5.0/5.0

Stain Resistance ASTMD 4265

	New	2 Washes	30 Washes	60 Washes	100 Washes
Yellow Dots 1					
Red Wine		5.0	5.0	5.0	5.0
Mustard		4.5	5.0	5.0	5.0
Chocolate Syrup		5.0	5.0	5.0	5.0
Oil Base Salad Dressing		2.7	1.5	1.2	2.7

Test Data Summary

Sample identification :

Beepee GRACE

Yellow dots Napkins

Stain Resistance ASTM D 4265

	New	2 Washes	30 Washes	60 Washes	100 Washes
Yellow Dots 2					
Red Wine		5.0	5.0	5.0	5.0
Mustard		5.0	5.0	5.0	5.0
Chocolate Syrup		5.0	5.0	5.0	5.0
Oil Base Salad Dressing		2.7	1.7	1.2	2.7

Yellow Dots 3					
Red Wine		5.0	5.0	5.0	5.0
Mustard		5.0	5.0	5.0	5.0
Chocolate Syrup		5.0	5.0	5.0	5.0
Oil Base Salad Dressing		4.8	5.0	5.0	5.0

Yellow Dots 4					
Red Wine		5.0	5.0	5.0	5.0
Mustard		3.8	4.4	5.0	5.0
Chocolate Syrup		5.0	5.0	5.0	5.0
Oil Base Salad Dressing		4.0	3.0	1.7	2.7

Yellow Dots 5					
Red Wine		5.0	5.0	5.0	5.0
Mustard		5.0	5.0	5.0	5.0
Chocolate Syrup		5.0	5.0	5.0	5.0
Oil Base Salad Dressing		5.0	5.0	5.0	5.0

Laundrying (Wash down) AATCC Test Method 61

	New	2 Washes	30 Washes	60 Washes	100 Washes
Yellow Dots 1	5.0	4.5	3.5	3.5	3.0
Yellow Dots 2	5.0	4.5	3.5	3.0	2.5
Yellow Dots 3	5.0	4.5	3.0	3.0	2.5
Yellow Dots 4	5.0	5.0	4.5	4.5	4.0
Yellow Dots 5	5.0	4.5	3.0	2.5	2.5

Test Data Summary

Sample identification :

Beepee GRACE

Yellow dots Napkins

Fabric Hand AaTCC Procedure#S

	New	2 Washes	30 Washes	60 Washes	100 Washes
Yellow Dots 1					
Pliable	5.0	6.5	6.5	7.0	8.0
Soft	5.0	7.0	6.5	7.0	8.0
Stretchy	1.0	1.0	1.0	1.0	1.0
Springy	5.0	5.0	5.0	5.0	5.0
Compact	9.0	9.0	9.0	9.0	9.0
Rough	8.0	5.0	5.0	4.5	4.0
Harsh	8.0	5.7	5.0	4.5	4.0
Yellow Dots 2					
Pliable	5.0	6.3	6.5	6.5	7.0
Soft	5.0	6.3	6.5	6.0	7.5
Stretchy	1.0	1.0	1.0	1.0	1.0
Springy	5.0	5.0	5.0	5.0	5.0
Compact	9.0	9.0	9.0	9.0	9.0
Rough	9.0	7.3	6.5	6.0	5.0
Harsh	8.0	6.7	6.0	6.0	5.5
Yellow Dots 3					
Pliable	7.0	8.0	8.5	9.0	9.5
Soft	5.0	6.3	7.0	8.0	9.0
Stretchy	9.0	9.0	9.0	9.0	9.0
Springy	5.0	5.0	5.0	5.0	5.0
Compact	9.0	9.0	9.0	9.0	9.0
Rough	7.0	5.3	6.0	5.0	4.5
Harsh	8.0	6.7	7.0	5.0	4.0

Test Data Summary

Sample identification :

Beepee GRACE

Yellow dots Napkins

Fabric Hand AaTCC Procedure#S

	New	2 Washes	30 Washes	60 Washes	100 Washes
Yellow Dots 4					
Pliable	6.0	7.3	7.5	8.0	9.0
Soft	6.0	8.0	8.5	9.0	9.5
Stretchy	1.0	1.0	1.0	1.0	1.0
Springy	5.0	4.0	4.0	4.0	4.0
Compact	9.0	9.0	9.0	9.0	9.0
Rough	7.0	5.7	5.0	5.0	4.5
Harsh	8.0	5.0	5.0	5.0	5.0

Yellow Dots 5					
Pliable	6.0	7.3	7.5	8.0	9.0
Soft	6.0	8.0	8.0	8.5	9.5
Stretchy	1.0	1.0	1.0	8.0	1.0
Springy	5.0	5.0	5.0	5.0	5.0
Compact	9.0	9.0	9.0	9.0	9.0
Rough	8.0	5.0	5.0	5.0	4.0
Harsh	7.0	5.3	5.0	5.0	4.0

Snagging Resistance Mace Method ASTM D 3939 Length x Width

	New	2 Washes	30 Washes	60 Washes	100 Washes
Yellow Dots 1		4.5/4.5	4.5/4.5	4.5/4.5	4.5/4.5
Yellow Dots 2		4.5/4.0	4.5/4.5	4.5/4.5	4.5/4.5
Yellow Dots 3		4.0/3.5	3.5/4.0	4.5/4.0	4.0/4.0
Yellow Dots 4		4.5/4.5	4.5/4.5	4.5/4.5	4.5/4.5
Yellow Dots 5		4.5/4.5	4.0/4.5	4.0/4.5	4.5/4.0

Key to Pilling Ratings/Snagging:

Class 5-No Pilling/Snagging

Class 4-Slight Pilling/Snagging

Class 3-Moderate Pilling/Snagging

Key to AATCC Gray Scale Ratings:

Class 5-Negligible or no color alteration

Class 4-Slight color change

Class 3-Noticeable color change

Each laundering cycle procedure was as follows :

Step	Operation	Time	Water Level	Wate Temp.	Chemicals/20 lb. Wt.
1	Flush	2.5min.	High	160F	None
2	Break	15 min	Low	160F	265 Built Detergent
3	Carryover	5 min	Low	150F	None
4	Flush	2 min	High	150F	None
5	Bleach	9 min	Low	150F	85g Bleach
6	Rinse	2 min	High	140F	None
7	Rinse	2 min	High	125F	6.3 Antichlor
8	Rinse	2 min	High	110F	None
9	Sour/Starch	10min	Low	95F	9.5g Sour/ Starch47.2g

**White Only*

TEST PROCEDURES

Dimensions :

ASTM D 3773, *Standard Test Method for Length of Woven Fabric, Option A.*

ASTM D 3774, *Standard Test Method for Width of Woven Fabric, Option B.*

Samples were conditioned at standard laboratory conditions of $70\pm 2^{\circ}\text{F}$ and $65\pm 3\%$ relative humidity prior to testing. Each sample was again weighted at the condition of 2, 30 and 100 washings. The results are stated in inches.

Weight :

ASTM D 3776, *Test Method for Mass per Unit Area (Weight) of Woven Fabric.*

Each Sample (napkin) was conditioned to standard laboratory conditions of $70\pm 2^{\circ}\text{F}$ $65\pm 3\%$ relative humidity prior to testing . Each sample was again weight ed at the condition of 2,30 and 100 washings. The unit weight of each napkin is reported 1 grams.

Wicking/

Absorbency *IST-10.1, Section 10*

A 2" x 8" sample was taken tested at the required intervals of 2,30,60 and 100 cycles. The sample was vertically and positioned so that one end was submerged in distilled water and allowed to stay for specified time after which the length of wicking was measured i n inches. This was likewise done in the width direction.

Flex Abrasion: (Stroll) ASTM D 3885

A sample was cut in both length and width directions, measuring 8 inches in length and 11/2 inches in width. Each sample was subjected to unidirectional reciprocal folding and rubbing over a bar having specified characteristics, under 4-pounds tension and 1 pound load. Resistant to flexing and abrasion was determined by the number of cycles necessary to rupture the fabric.

Tensile Strength: **ASTM D 6043**, *Test Method for Breaking Strength and Elongation of Textile Fabrics (Strip Method)*

A 4-inch wide sample was mounted continually in clamps of tensile testing machine and a force applied until the sample broke. Each sample was tested in both length and width directions. The average values are reported in pounds force.

Yarn Number: **ASTM D 1059**, *Standard Test Method for Yarn Number Based on Short-Length Specimens.*

Each sample was tested in both warp and fill directions and the appropriate CC(Cotton Count) or den (Denier) number recorded.

Yarn Type: **AATCC Test Method 20**, *Fiber Analysis: Qualitative.*

Testing was done under microscope examination at 10X and compared to photomicrographs of known yarn types.

Pilling Resistance: **ASTM D 3512**, *Standard Test Method for Pilling Resistant and Other Related Surface Changes of Textile Fabrics : Random Tumble pilling Tested Method.*

Pilling and other changes in surface appearance, such as fizzing, that occur in normal wear are simulated on a laboratory testing machine. Fabrics are caused to form typical pills by a random rubbing motion produce by tumbling specimens in a cylindrical test chamber lined with a mildly abrasive material. In order to form pills that resemble those produced in actual wear in appearance and structure, small amount of short length cotton fiber (gray in color) are added to each test chamber with the specimens. The degree of fabric pilling is evaluated by comparison of the tested specimens with visual standards that may be actual fabrics or photographs of fabrics, showing a range of pilling resistance. The observed resistance to pilling is reported on an arbitrary scale ranging from No.5 (no pilling) to No.1 (very severe pilling).

Stain Resistance: **ASTM D 4265**, *Guide for Evaluating Stain Removed Performance in Home Laundering.*

This test was modified to the extent that four stains were used : Rd Wine, Mustard, Chocolate Syrup and Oil Based Salad Dressing. One stain was applied in each of the four corners of each napkin in equal amounts. The stains were allowed to dry prior to washing. They were then graded after the next full wash cycle based on the AATCC Gray Scale Rating after the next full wash cycle based on the AATCC Gray Scale Rating where:

- 5 - Negligible or no staining
- 4 - Slightly stained
- 3 - Noticeably stained
- 2 - Considerably stained
- 1 - Heavily stained

Fabric Hand: AATCC Evaluation Procedure 5, Fabric Hand.

The control napkins were assigned an arbitrary number by a panel of three people. Thereafter, at 2,30,60 and 100 washings, the number scores were based upon “more” or “less” in each category, i.e. “more” soft would increase the original (control) value and “less” soft would decrease the original value.

Color

Wash down: AATCC Test Method 51, Colorfastness to Laundering. Home and Commercial Accelerated.

The test method was modified to the extent that each napkin type and color was tested as received using a Hunter Color Spectrophotometer. After the washing intervals of 2,30,60 and 100 washes, a test was conducted which compared and rated that sample to the original. The rating scale was incorporated within the software of the equipment and was based on:

- 5 - Negligible or no staining
- 4 - Slightly stained
- 3 - Noticeably stained
- 2 - Considerably stained
- 1 - Heavily stained

Snagging

Resistance: ASTM D 3939, Standard Test Method for Snagging Resistance for Fabrics (Mace Test Method).

A Fabric specimen in tubular form was mounted on a rotating cylinder. A mace (spiked ball) was allowed to bounce randomly against the rotating specimen. As the mace bounces over the specimen, snags could occur to a degree affected by a variety of fabric factors. The degree of fabric snagging was then evaluated by comparison of the tested specimens with visual standards that may be either fabrics, or photographs of fabrics showing a range of snagging resistance. The observed resistance to snagging was reported on a scale ranging from No.5 (no snagging) to No.1 (very severe snagging).

TEST RESULTS: The results are presented on the following pages.

Report

Purpose:	Determination of tensile strength, tear resistance, resistance to abrasion and to form pills, dimensional change in washing, color fastness to washing and water absorption capacity after wash.
Test Material:	Six table-cloth, two white, two green and two red, all marked Impressions "spun polyester". Test Material was received from the client : September 08, 1997.
Procedure:	<p><u>Tensile strength</u> was performed according to ISO 5081-1977. CRE-testing machine. Capacity. 5000 N. 5 determinations/ direction.</p> <p><u>Tear resistance</u> was performed according to SIS 25 12 31. 5 determinations/ direction.</p> <p><u>Dimensional change in washing</u> was performed according to SS-EN 25 077:1994, Wash according to SS-EN 26 330:1994, procedure IA, 92°C. Wash machine Wascator FOM 71MP and detergent IEC B with perborate, 2 g/l. Hardness of water 3,5-4 dH. Dried in an Wascator TT200 tumble dryer, 70°C. 3 determinations/ direction.</p> <p><u>Abrasion resistance</u> was performed according to BS 5690:1991, Martindale tester. Four test specimen were prepared and abraded on prescribed woven standard fabric of wool. Type of felt : Nonwoven, mass per unit area>625g/ m2. Presuure:12 kPa. Method of assessment: Breakdown of the second thread.</p> <p><u>Pilling resistant</u> was performed according to SN 198 525 :1990, Martindale tester.</p> <p><u>Color fastness to washing</u> was performed according to SS-EN 20 105-C06:1993, test nr C2S, 60°C. Number of steelballs:25. Detergent ECE with per borate. Sour treatment described in 6.7 was not conducted Drying: In a drying cabinet max 60°C. Adjacent fabric type TV and standard fabric of polyester and cotton.</p> <p><u>Water absorption capacity</u> was performed in principal according SS 25 12 28 after one wash as above.</p>

Results:

Tensile strength

Direction	Length	Width
Breaking strength, N/50mm		
Test piece		
1	1880	1280
2	1840	1320
3	1920	1280
4	1880	1320
5	1890	1320
Mean value	1890	1300
Elongation at break, %		
Mean value	30	23

Test resistance, N

Tear direction	Length	Width
Test piece		
1	46	68
2	50	68
3	48	66
4	47	63
5	47	62
Mean value	48	65

Dimensional change in wash %

Direction	Length	Width
Mean value	-1.2	-0.2
Range	0.4	0.0

Resistance to abrasion, number of cycles before breakdown of the second thread

Test piece	1	30 000
"	2	>50 000
"	3	>50 000
"	4	>50 000
Mean value		>45 000

Resistance to forum pills, grade

Assessment after	125 cycles	4
"	500 cycles	4
"	2000 cycles	3

Color fastness to washing grade

Adjacent fabric Color	TV		Standard fabric	
	Green	Red	Green	Red
Change in color	4-5	4-5	4-5	4-5
Staining on white weave of				
- viscose	4-5	4	-	-
- acrylic	4-5	4-5	-	-
- polyester	4-5	3	4-5	3
- polyamide	3	1-2	-	-
- cotton	4-5	4	4-5	4
- triacetate	4-5	3	-	-

Logarithmic scale 1-5,5= no change in color or staining.

Water absorption

Specimen	a bsorption, % After 10s		max		at time, s	
	Frontside	Backside	Frontside	Backside	Frontside	Backside
1	89	108	122	120	74	74
2	95	115	121	140	94	
3	110	93	123	143	42	74
Mean value	98	105	122	134	70	70



Washing & Laundering

Agitation/
Machine Action



Detergent



Washing & Laundering

The Washing Cycles

Flush

- Floods loose soil away
- High water level
- Low water temperature (7°C - 16°C)

Suds/Break

- 7-10 minute cycle removes 95% of soil
- Low water temperature (19°C-22°C)
- Detergent and Alkali added
- Soap vs. Detergent :
 - ◆ Soap must have soft water
 - ◆ Soap is made from animal fats
 - ◆ Detergent can precipitate in hard water
 - ◆ Detergent is synthetic
 - ◆ Detergent emulsifies oil
- Alkali builds pH
 - ◆ $\text{pH} > 7$ = Basic
 - ◆ $\text{pH} < 7$ = Acidic
 - ◆ Titration measures alkalinity
- Soil is acidic
- Alkali loosens fabric to release soil
- Alkali increases detergent performance
- Alkali works for cotton
- ALKALI WILL WORK AGAINST POLYESTER!

Carry Over Suds

- Heavy soil conditions
- Low water level
- High water temperature (19°C-22°C)

Bleach

- Roles
 - ◆ Stain Removal
 - ◆ Sterilization
 - ◆ Whitening Maintenance
- 4 Factors of Control
 1. Quantity and Concentration (1-2 qts. 1% available chlorine per 45.5 kgs linen)
 2. Time and Temperature
 - 7-10 minutes for full benefit
 - Optimal temperature is 16°C to 21°C
 - TEMPERATURES IN EXCESS OF 21°C CAN BE DAMAGING TO ALL
 3. Alkalinity (Bleach pH of 10.2 10.8)
 4. Rinse Temperature
 - Must decrease temperature in each of 3 rinses
 - Increase in rinse temperature can react with bleach and decrease fabric tensile strength
- Low water level
- Problems of improper bleaching
 - ◆ NEVER MIX WITH SOUR
 - ◆ Every -23°C increase in temperature doubles strength
 - ◆ Every -23°C decrease in temperature reduces strength by half
 - ◆ Bleach whites only !
- Oxygen / Optical Bleach
 - ◆ 35% Peroxides recommended
 - ◆ Pros : less damage and works well at high pH
 - ◆ Cons : more expensive

Rinse

- Rinsing out chemicals
- 2-3 minute cycles
- High water levels
- Decrease temperature in -23°C - -21°C increments per rinse cycle
- Last rinse should be within 30-40 ppm of alkalinity of tap water (3-4 drops 1/10th acid)

Sour

- Neutralizing alkalinity with acids
- 4-5 minutes for full benefit
- Low water temperature of 3.3°C to 7°C aids in dissolving solution
- pH of 5.5 to 6.0 for tumble dry linen
- pH of 6.0 to 6.5 for flat work
- Problems of improper souring
 - ◆ Yellowing of whites
 - ◆ Fading of colors
 - ◆ Skin irritation
 - ◆ Odor
 - ◆ Do not use FWAs or optical brighteners in sour, yellow stain may result.

Starch

- Added with Sour
- Low water level
- Low water temperature (1.67°C)
- Amount of starch depends on degree of body desired (226 gms - 340gms)
- Do not extract below 25% water retention

Softeners

- NOT RECOMMENDED FOR SPUN POLYESTER
- Works against soil release
- Deters water absorption
- Added with sour
- 56.7 gms - 85 gms Per 45.5 kgs Linen
- Low water level
- Low water temperature (1.67°C)
- Improves handling
- Reduces hardness
- Reduce static

Guide to Washroom Formulas

ROSSARI BIOTECH RECOMMENDED WASH FORMULAS

Troubleshooting in the Washroom

The following are usually the factors at fault when problems develop in the washroom.

Poor Soil Removal

Not enough suds baths
Insufficient suds time
Temperature too low
Insufficient alkali/soap/detergent
Overloading wash wheels
Improper classifying
Mixing soil loads
Wrong formula being used

Poor Color (Redeposit ion)

Hard water
Overloading washwheels
Insufficient alkali/soap/detergent
Poor balance of alkali to soap/surfactant
Too few rinses
Cutting rinse times

Poor Color - Whites (other than redeposit ion)

Yellow/Brown

- Iron
- Poor rinsing
- Undersouring
- Unneutralizing bleach

Yellowing -

- Coloring retentative resins

Pink -

- Iron/bleach/brightner Complex Bleeding

Troubleshooting in the Washroom

Poor Color Whites (Other than redeposition)

Green -

- Metallic salts
- Bleeding

Dull -

- Insufficient bleach
- Too weak bleach
- Too short bleaching time
- Not enough flushes
- Not enough rinses
- Rinses too short
- Poor soil removal

Poor Color Colors (Other than redeposition)

Dull/Dead -

- Not enough flushes
- Not enough rinses
- Rinses too short
- Poor soil removal
- Poor Stain Removal
- Too little bleach being used
- Bleach stock solution too weak
- Improper bleach pH
- Temperature too high or very low
- Too high a water level in bleach bath
- Overloading
- Too much soil in bleach bath
- Too short a bleaching time
- Improper bleach for stain Type

Troubleshooting in the Washroom

High Tensile Strength Loss Bleach too strong too much bleach
Low bleach pH
Too high bleach temperature
Stream on bleach bath
Excessive mechanical action
 Under loading
 Too lengthy formulas
 Too much time between filling/draining
 Too low water levels
Excessive use of highly alkaline builders in
presence of stream or very high temperatures
Improper souring agents

Linting/Pilling Excessive mechanical action
 Under loading
 Too lengthy formula
 Too much time between filling/draining
 Too low water levels
 Leaky washwheels

Short Textile Fibers Low twist yarns
Rough surfaces in washwheels, conditioners,
tumbles, or on flatwork ironers Excessive use of
bleach/low pH bleaching/high temperature
bleaching Excessive use of strong alkalies in
presence of steam or very high temperatures
Improper souring agents

Troubleshooting in the Washroom

Odor in Textiles

- Hard a water reacting with soap
- Fermentation of poorly soured loads
- Excessive use of sour
- Poor soil removal
- Incomplete rinsing
- Resin treated fabrics

Flatwork Rolling

- Excess sour
- Too short a souring time
- Improper addition of sour
- Wrong type of sour
- Work too damp
- Dirty ironer chests
- Build-up on chests
- Ruse on chests
- Cold chests
 - Improperly sized steam lines
 - Steam pressure not high enough
 - Traps not operating Properly
 - Chests bound with air
 - Warped chests
 - Starch on chests
 - Static electricity
 - Improper feeding
 - Lack of lubrication in fabrics
 - Poorly maintained apron covers, padding, ribbons, and guide strings

Washroom

Washwheels

- ☐ Should be cleaned and lubricated regularly
- ☐ Check for over greasing and leaking grease
- ☐ Keep water and dump valves tight
- ☐ Keep doors and latches tight
- ☐ Eliminate rough or protruding edges that cause tears and rips
- ☐ Check water gauges and thermometers for accuracy
- ☐ Keep cylinders free from lime soap
- ☐ Keep motors clean (no lint between fields)
- ☐ Keep belts tight with no slippage

Extractors

- ☐ Keep clean and well lubricated
- ☐ Should be easy to balance
- ☐ Check perforations in baskets for ample size (may need drilling)
- ☐ Check for proper speed
- ☐ Keep motor clean
- ☐ Should attain speed quickly

Graying - Results off Standard

Graying or redposition refers to the gradual discoloration of fabrics white or colored. It can generally be recognized as a dull off-color or dingy gray cast on fabrics. The following checklist is arranged from the most to least likely common cause.

Causes	Solutions
<ul style="list-style-type: none">a. Insufficient detergent usageB. Improper washing and/or rinsing temperaturesC. Not enough rinsing, eliminating rinse timed. Mixing fabrics with different soil levels in a single loade. Water hardness higher than tested when formulas were installed.	<ul style="list-style-type: none">a. Use product amountsb. Set water temperature at recommended levels for that classification .c. Use recommended number of rinses at the correct water levels for the proper length of time.d. Pre-sort items to insure fabrics similar soil levels are included in each load.e. If a mechanical water softener is used, determine if it is working properly or if it needs to be repaired or recharged. If no softener is used, increase detergent usage to compensate for additional hardness.

Stains - Results off Standard

In referring to stains as opposed to poor soil removal, we mean items which are basically clean but have an unacceptable rate or pretence of stains. The following checklist is arranged in sequence form the most to least probable cause of an increase in common stains such as blood, food, grease and medication.

Causes	Solutions
<ul style="list-style-type: none">a. Overloading the washwheelb. Washer controls malfunctioningc. Improper break temperatured. Improper bleachinge. Liquid bleach stock solution not strong enoughf. pH of bleach bath out of rangeg. Too much soil carried into bleach bathh. Insufficient souring for acid soluble Stains	<ul style="list-style-type: none">a. Reduce fabric weight to meet plant standardb. Insure controls are working properly, especially water level, temperature therm controls, and dump valves.c. Insure water temperature is at the recommended level during the break.d. Use correct amount of bleach at the recommended temperature for the recommended time interval.e. Mix bleach to obtain concentration.f. Reduce product usage or give a flush prior to bleach bathg. Use recommended number of flushes prior to bleach bath.h. Use recommended amount of sour for that classification.

Yellowing/Browning - Results off Standard

Yellowing/browning refers to general yellow/brown discoloration or deposit on the fabric as opposed to a dull gray color (grayness). It can be splotchy in appearance and in severe cases deep in color. The following checklist is arranged most to least likely common causes of this trouble.

Causes	Solutions
<ul style="list-style-type: none"> a. Not enough rinses b. Insufficient souring confirming c. Bleach overuse d. Fabric softener build-up e. Iron in the water-confirm with water iron test f. Fabric retains too much chlorine 	<ul style="list-style-type: none"> a. Use recommended number of rinses at the correct water levels and temperatures. b. Use recommended amount of sour. c. Use recommended amount bleach. d. Insure fabric softener is added at the right time in the right quantity and at the right temperature. e. 1. Use an iron sequestering agent 2. Use recommended amount of rust-removing sour (like Control) f. Use an anti-chlor.

Supply Costs - Results off Standard

The following checklist has been arranged in a sequence from the easiest to check/must likely causes, to the more difficult to check /less likely causes.

Problems / Causes	Solutions
<ul style="list-style-type: none"> a. Check to see if several production unit costs b. Review record for accuracy Inventory Billing c. Review historical data for "highs and "low" from different billing inventory periods d. Is washman using the wrong size scoops? e. Is washman using the wrong number of scoops? f. Are wheels being improperly loaded? 	<ul style="list-style-type: none"> a. 1. If yes, check production tallies are out of range for math errors 2. If no, continue b. 1. If inaccurate, correct 2. If accurate, continue c. 1. If yes, average high and low periods and compare to base period d. 1. If yes, weight and proper size scoops. 2. If no, continue e. 1. If yes, train washman to use the appropriate amount 2. If no, continue. f. If yes, load wheels to Planet Standard.

Odor

The sense of smell be a useful laundry evaluation tool. Knowing the smell of particular soil can sometimes tell you the cause of a problem without elaborate testing. Specific causes and solutions include :

Problems / Causes	Solutions
<ul style="list-style-type: none">a. Oily, greasy smells (work not thoroughly clean)b. Oily, greasy smells (incomplete rinsing)c. Chlorine odord. Mustiness (fermentation) e. Fatty odor (lime soap on cloths)f. Sharp odor-sour odor (over use of sour - confirm with pH test)	<ul style="list-style-type: none">a. Insure correct formula is being used for that classification.b. Rinse properly.c. Use bleach properly.d. 1. Sour properly and cool load before pulling. 2. Don't let load stand overnight without extractinge. Soften water.f. Use proper amount of sour

Poor Soil Removal - Results off Standard

By poor soil removal we refer to items which simply do not come out clean as opposed to gradually discoloring. The following checklist is arranged in sequence from the most to least likely common causes.

Causes	Solutions
<ul style="list-style-type: none">a. Incorrect formula being usedb. Improper product usagec. Skipping formula operationsd. Improper pre-sortinge. Overloading the washwheelf. Washer controls malfunctioningg. Water hardness higher than tested formulas were installed (confirm using water hardness tests)	<ul style="list-style-type: none">a. Use correct formula for each classification washed.b. Use product amounts recommendedc. Insure all formula operations are followed completely and in the proper sequence.d. Insure items are properly pre-sorted So formulas accurately match soil Levels being washede. Reduce fabric weight to meet plant standardf. Insure controls are working properly, especially water levels and temperature (them) controls and dump valves.g. If a water softener is used, determine if it is working properly or if it needs to be repaired/recharged. If a water softener is not used, slightly increase detergent usage to compensate for additional hardness.

ROSSARI BIOTECH RECOMMENDED WASH FORMULAS

GRACE WHITE

Operation	Water			Liquid Supplies/cwt	Powdered Supplies/cwt
	Time	Level	Temp (C)		
Flush	2	High	37.8°-60°		
Break ⁽¹⁾	10	Low	71.1°	453 gm Liquid Alkali 170 gm Liquid Detergent	453-680 gm Built Detergent
Carry/Over	4	Low	71.1°		
Flush	2	High	71.1°		
Bleach	8	Low	65.6°	170-340 gm 10% Chlorine Bleach	85-113.4 gm Organic Dry Bleach
Rinse	2	High	60°		
Rinse	2	High	51.7°	28.35 gm Liquid Antichlor	28.35 gm Dry Antichlor
Rinse	2	High	43.3°		
Sour ⁽²⁾ /Sour & Starch ⁽³⁾	5/10	Low	35°	28.35-56.7 gm Liquid Sour ⁽⁴⁾ 227-340 gm Liquid Starch	28.35-56.7 gm Dry Sour ⁽⁴⁾ 227-340 gm Dry Starch
Extract ⁽⁵⁾	3	-----	-----		

GRACE COLORS

Operation	Water			Liquid Supplies/cwt	Powdered Supplies/cwt
	Time	Level	Temp (C)		
Flush	2	High	37.8°-60°		
Break ⁽¹⁾	12	Low	71.1°	340 gm Liquid Alkali 227 gm Liquid Detergent	28.35-42.5 gm Built Detergent
Carry/Over	4	Low	71.1°		
Rinse	2	High	60°		
Rinse	2	High	51.7°		
Rinse	2	High	43.3°		
Sour ⁽²⁾ /Sour & Starch ⁽³⁾	5/10	Low	35°	28.35-56.7 gm Liquid Sour ⁽⁴⁾ 227-340 gm Liquid Starch	28.35-56.7 gm Dry Sour ⁽⁴⁾ 227-340 gm Dry Strach
Extract ⁽⁵⁾	3	-----	-----		

- 1) Alkalinity of break operation should be between 650-1,500 ppm Na₂O.
- 2) Refrain from using FWAs in final operation. Unremovable yellow stains may results.
- 3) Amount of starch depends upon the degree of body desired (8-12 oz).
- 4) Sour Load to pH = 5.5-6.5
- 5) If starching, do not extract below 25% water retention.

The above formula recommendations are designed as starting guidelines. The products and actual formulas may vary depending upon the machine size and type, soil levels, water conditions, product availability, etc. Contact your ROSSARI BIOTECH (INDIA) P. LTD. Representative for more specific data, at +91 22 32471795

ROSSARI BIOTECH RECOMMENDED WASH FORMULAS

GRACE WHITE

<u>Operation</u>	<u>Water</u>			<u>Liquid Supplies/cwt</u>	<u>Powdered Supplies/cwt</u>
	<u>Time</u>	<u>Level</u>	<u>Temp (C)</u>		
Flush	2	High	37.8°-60°		
Break ⁽¹⁾	10	Low	71.1°	453 gm NDT SuperSil#100 170 gm NDT SupraSolv	453-680 gm Resolve/ For Sure
Carry/Over	4	Low	71.1°		
Flush	2	High	71.1°		
Bleach	8	Low	65.6°	227 gm NDT Bleach Plus	85-113.4 gm DynaClor
Rinse	2	High	60°		
Rinse	2	High	51.7°	28.35 gm NDT NeutraClor	28.35 gm NeutraClor
Rinse	2	High	43.3°		
Sour ⁽²⁾ /Sour & Starch ⁽³⁾	5/10	Low	35°	28.35 gm NDT Sour/Iron ⁽⁴⁾ 227-340 gm NDT Polystarch	28.35 gm Control ⁽⁴⁾ 227-340 gm Krizp
Extract ⁽⁵⁾	3	-----	-----		

GRACE COLORS

<u>Operation</u>	<u>Water</u>			<u>Liquid Supplies/cwt</u>	<u>Powdered Supplies/cwt</u>
	<u>Time</u>	<u>Level</u>	<u>Temp (C)</u>		
Flush	2	High	37.8°-60°		
Break ⁽¹⁾	12	Low	71.1°	453 gm NDT SuperSil#100 170 gm NDT SupraSolv	28.35-42.5 gm Resolve/ For Sure
Carry/Over	4	Low	71.1°		
Rinse	2	High	60°		
Rinse	2	High	51.7°		
Rinse	2	High	43.3°		
Sour ⁽²⁾ /Sour & Starch ⁽³⁾	5/10	Low	35°	28.35 gm NDT Sour/Iron ⁽⁴⁾ 227-340 gm NDT Polystarch	28.35 gm Control ⁽⁴⁾ 227-340 gm Krizp
Extract ⁽⁵⁾	3	-----	-----		

- 1) Alkalinity of break operation should be between 650-1,500 ppm Na₂O.
- 2) Refrain from using FWAs in final operation. Unremovable yellow stains may results.
- 3) Amount of starch depends upon the degree of body desired (8-12 oz).
- 4) Sour Load to pH = 5.5-6.5
- 5) If starching, do not extract below 25% water retention.

The above formula recommendations are designed as starting guidelines. The products and actual formulas may vary depending upon the machine size and type, soil levels, water conditions, product availability, etc. Contact your ROSSARI BIOTECH (INDIA) P. LTD. Representative for more specific data, at +91 22 32471795



Concrete Stain Removal Formula

Operation	Product	Level	Temp. (°C)	Time
Lubrication	Dust control Clear 1.82 kg	High	3-7	8 min
Suds	Heavy Duty Detergent 2.3 kg	Low	28	40 min
Rinse		High	Hot	2 min
Rinse		High	Split	2 min
Rinse		High	Split	2 min
Rinse		High	Cold	2 min
Sour	Rust Neutralizing Sour 28 gms	Low	Cold	5 min

Waterproof Lipstick Removal Formula

Operation	Product	Level	Temp. (°C)	Time
Break	Solvent/Surfactant 909 gms	Low	9.4	10 min
Breach	Hypo chlorite 283.5 gms	Low	9.4 -12.5	15 min
Rinse		High	Split	2 min
Rinse		High	Split	2 min
Rinse		High	Cold	2 min
Antichlor	Antichlor 28 gms	High	Cold	3 min
Sour	Sour 28 gms	Low	Cold	4 min

Note : All Operations are followed by drains.

Product amount are based on 100 pounds loads.

If you have questions or need further support, please call the



Team at +91 22 2240 1213



Spun Polyester Napery and Tablecloth Formula

Load : 90% Capacity (Open Pocket)

75 % Capacity (Split Pocket)

66% Capacity (Y Pocket)

<u>Operation</u>	<u>Time</u>	<u>Temp. (°C)</u>	<u>Level</u>	<u>Supply</u>	<u>Usage/cwt</u>
Break	5min	Split	Low	Spectrum Liquid Horizon Express	11-15 ft. oz. 9-12 ft. oz. 18-28 ft.oz
Do Not Drain					
Break	10 min	22	Low		
Carryover	5 min	Hot	Low		
Flush	2 min	Hot	High		
Suds/Bleach*	8 min	18	Low	Spectrum Liquid Horizon Bleach*	3-5 ft. oz. 2-4 ft. oz. 6-8 ft. oz.
Rinse	2 min	Hot	High		
Rinse	2 min	Split	High		
Rinse	2 min	Cold	High		
Rinse	5 min	Cold	Low	Pinn. Sour Pinn Antichlor	1-2 ft. oz. 1-2 ft. oz.

Bleach is added for white loads only. DO NOT BLEACH COLORED GARMENTS.

If you have questions or need further support, Please call the



Team at +91 22 2240 1213



beepee enterprise pvt.ltd.

STATEMENTS

for exquisite settings GRACE Processing tips

IRONING TEMPERATURE

Maintain mangle temperature between 157°C and 180°C for gas, steam and electric equipment.

Recommended temperature is 160°C.

COLOR SORTING

Colors should be sorted into white, light, medium and dark categories.

Dark and light shades should not be processed together.

BLEACH

Bleach may be used on all whites.

Do not overload machine for better agitation and less wrinkling.

Always avoid softeners.

KEEP EXTRACTION SHORT : 2-5 MINUTES

Do not over extract. This can cause starch to “sling” off, if starch was added.

RECOMMENDED LAUNDRY PROCEDURE FOR SPUN POLYESTER NAPERY

Step	Operation	Time	Water level	Temperature°C
1	Flush	2	high	71.1°C
2	Break	15	Low	71.1°C
3	Carryover	5	low	71.1°C
4	flush	2	High	
5	bleach	10	low	
6	rinse	2	high	60°C
7	rinse	2	high	51.7°C
8	rinse (antichlor)	2	high	51.7°C
9	sour	8	low	32.2-37.8°C (ph range 6-6.5)
10	starch*	10	low	32.2-37.8°C
11	extract			

*Starch: If starch is desired, the recommended starch level is 226.8 - 255.2 gms of starch per 45.5 kg weight.



Product Range

**Standard off shelf
Grace -- Damask**

**Ivy Leaf
Satin Band
Plain
Chef coat
Overall
Bedlinen**

Speciality Fabrics

**Water Satin Resistance
Fire Retardents
Anti static Properties in fabrics
(Excellent for Airlines)
Bacteria free world**

NOTES

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

NOTES

This image shows a full page of a handwriting practice worksheet. It consists of multiple rows of horizontal dashed lines spaced evenly down the page, providing a guide for letter height and placement. The background is plain white, and there are no other markings or text present.



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