Party Wear for Children

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Abstract

Clothing is one among the most important three basic needs in every human being. It protects our body from various climates and gives us a good appearance for youthful world; children are given more care for the selection of their own cloths. Today children are largely exposed through various media. They themselves the customers in their own rights. They also have their own definite opinion for the cloths they wear. The designers concentrate on simplicity, comfort and new look in design a garment. Generally kids are grouped according to their age as Infant, Toddlers and Children. In this paper we focused on the clothing of children[1].

Introduction

The ideal baby clothing should be soft, comfortable, easy to put on and take off and comparatively loose. It should be light weight, non irritating, allow quick transmission of sweat from skin to environment. Children garments are generally classified into many categories such as Casuals like T- shirts, knitted garments etc, Day wear made by cotton, gingham, gabardine fabrics[2]. Uniforms, Sports wear made by knitted garments which show good extensibility in both warp way and weft way directions. In this paper we are mainly focused on the luxurious Party wear of children. Fabrics like HBT, denim, satin etc are used in party wears. They have to be dyed with attractive colors with good fastness properties. Soft, comfortable feel of the fabric can be presented by using suitable finishing chemicals. Finished fabrics have been characterized by wetting time, wicking behaviour. Strength parameter, color fastness properties and soil release properties.

Experimental

Materials

100% cotton yarn was used in the investigation. Details of the fibre, yarn & fabric construction are given below

Fiber selection: Cotton (J – 34 & S – 6)

Yarn selection:

- 30 Karded yarn
- 2/50 Siro yarn
- 32 Karded yarn

Fabric preparation
Suitable children fabric has been made in CCI desk loom with previously mentioned yarn quality

Pretreatment of fabric

- Pretreatment of fabric was carried out in Continuous bleaching Range (Made by: Beninzer)

Process	Chemical	Function	Vendor	Dosing (ml/kg)
Desize	Luzyme HP	Enzyme	BASF	2
	Kieralon FALB	Wetting agent	BASF	4
	Lufibrol MSD	Sequestering agent	BASF	2
Scouring	H2O2	Oxidising agent		12
	NAOH	Alkali		18
	Lufibrol MSD	Sequestering agent	BASF	3
	Stabiliser SIFA	Stabiliser	CLARIANT	3
				3
Bleaching	H2O2	Oxidising agent		25
	NAOH	Alkali		10
	Lufibrol MSD	Sequestering agent	CLARIANT	3
	Stabiliser SIFA	Stabiliser	CLARIANT	5

- Bleached fabric was Mercerized in Continuous Mercerising Range (Made by: Beninzer) with 300gpl caustic

- peaching has been carried out for some selective fabrics in Peaching machine (Made by: Lafer) by maintaining suitable peaching parameters

Pile/ Counterpile- 100/-100
Drum speed -40
Fabric speed - 25
Fabric tension- 3.5 N

Dyeing of cotton fabric

- Each fabric samples have been dyed in continuous dyeing machine (Pad dry- Made by: Monforts, pad steamer-Made by: Beninzer) with different attractive shades and Reactive colors were used to dye those fabrics. Details of shades and name of dyes are given below.

Color of Shade	Colors Used	Gpl	Company name
Baby Yellow	Levafix Brilliant Yellow CA	0.80	DYESTAR
Parrot Green	Remazol Yellow HGL	20	DYESTAR
	Remazol Turquish Blue G	5.7	DYESTAR
	Jakazol Green Yellow RNL	1.0	JAYSANTH
Purple	Jakazol Red RB	8.3	JAYSANTH
	Jakazol Blue RN	10	JAYSANTH
Turquish	Jakazol Turquish Blue G	15	JAYSANTH
	Jakazol Blue RN	0.30	JAYSANTH

Finishing of wool

Dyed cotton fabric samples were padded on Stenter (Made by: Monforts) with modified hydrophilic silicon emulsion (Made by: RESIL) Innocell FSS - 20 gpl with 55% pick up followed by dry at 150^0C for 1 min and then finished fabric sample undergo Sanforising (Made by: Monforts) machine.

Characterization of treated samples

Finished samples were tested for change in performance properties such as wetting and wicking behaviour.All samples were conditioned for 24h in standard atmosphere before testing.

Water absorbency time was measured as the time taken for the absorption of an water droplet by the fabric. Fabric was held horizontally at its two ends, with clamps, keeping it free of folds. A drop of water was released onto it from a syringe from a height of 40 mm. Time taken for the complete absorption of drop by the fabric was recorded using a stop watch. This test was repeated on five different parts of the fabric and the average wetting time was calculated.

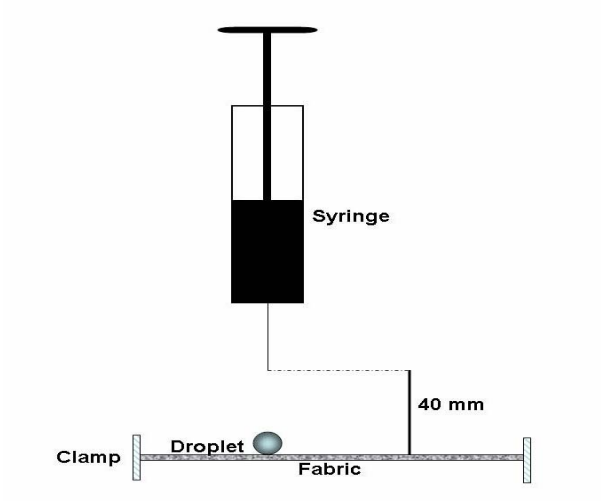


Figure2 Schematic of the set up used for measuring the wetting time of fabric

Vertical wicking test

Rectangular cotton finished sample (100mm x 20mm) was used for the wicking measurement. One datum line L1was marked along the longitudinal direction of the fabric, at a distance of 10 mm respectively from one end of the sample. The sample was immersed in water up to L1 and the distance covered by water with time was measured.

Evaluation of tensile properties and bending length

Warp way and weft way breaking strength of untreated and treated cotton fabric samples were determined after conditioning the samples by standard methods following the Grab method as per ASTMD 5034 procedure using Instron (model-1445) CRT universal tensile tester with a traverse speed of 100 mm/min and a pretension of 0.5N. The final gauge length of the fabric sample was 100mm* 50mm after raveling. The test results reported are an average of 10 tests for each sample.

Both warp way and weft way of untreated and treated cotton fabrics have been measured as per 1S:6490-1971 (cantilever test) method using a Sasmira stiffness tester with a specimen size of 200mm*25mm.

Wash fastness test
This test has been carried out as per AATCC test method 61

Water fastness test
This test has been carried out as per AATCC test method 107

Perspiration fastness
This test has been carried out as per AATCC test method 15

Rubbing fastness
This test has been carried out as per AATCC test method 8

Soil Release test
Soil release test has been carried out as per AATCC test method 130-2010. A specimen of (38cm*38cm) is stained with 5 drops of corn oil in the centre of the specimen. Place a glassine paper over it for 1 minute with maintaining 50gm load. After that fabric has been washed with AATCC Standard Reference Liquid Detergent for 20 minutes. Dry the specimen and rate residual stains within 4h after drying.

Results & Discussion

Fabric construction
Childs party wear should be attractive, lustrous, smooth, and soft. Lightweight garments should be preferred in subtropical country because it can be able to transmit moisture in to the environment easily. Children feel more comfortable on wearing cotton fabrics. Garments will be looser to wear. So, by keeping those parameters in mind the design of the fabrics have been done. Details of the fabric construction are given below **Table1**

Table1 Children fabric construction

Article	warp & weft count	GSM	EPI & PPI	Design	Cover factor
S-1 (P)	. 30K x 30K	160	136 x 60	4/1	26.06
S-2 (P)	32K x 30K	162	144 x 60	3/1 (s)	26.48
S-3 (P)	50/2R* 30K	195	118* 96	3/1 (z)	26.36
S-4	30K* 30K	135	76*78	2/2 HBT	21.08
S-5	30K* 30K	210	146* 96	Dobby	27.51

"P" indicates peach quality

It can be observed from the **Table 1** that in all cases karded yarn has been used because it is bulkier and spacier in nature due to high specific volume compared to combed yarn. All the fabric show good soft and lustrous property because of low G.S.M & satin, denim design respectively.

Wettability of fabric samples

All finished fabric samples show good wetting properties. It can be observed from the Table 2 that all the finished fabric show slightly higher wetting time than unfinished fabric. Sample S-1, S-2 & S-3 show almost same absorbancy. In case of sample S-3 it was slightly lower because this fabric was made from coarser count yarn. S-4 was characterized by less cover factor, so it show less wetting time. Hand sample contain more cover and more floats almost equal to satin quality, and as a result wetting time even higher than satin (S-1) fabric.

Table2 Wetting time of different fabric samples

Article	Wetting time (sec)	
	Unfinish	Finish
S-1 (P)	4	7
S-2 (P)	5	7.5
S-3 (P)	4.5	6.32
S-4	3.2	4
S-5	4.5	7.8

Vertical wicking of different samples

Wicking behaviour can be explained with reference to the capillary action of water which is defined as the upward movement of water against gravitational force within the spaces of a porous material. It is a function of the forces of adhesion (attraction between water molecules and the substrate due to intermolecular forces of attraction), cohesion (attraction between water molecules), and surface tension. Capillary action occurs when the adhesive inter molecular forces between the liquid and the substrate is stronger than the cohesive intermolecular forces within the liquid. Cotton fibre, yarn quality, fabric construction and finishing chemicals contribute significantly to the adhesive forces between the cotton fabric surface and water molecules, leading to an increase in wickability[3]. Moreover if the pore size is small and relatively uniform, water level can rise to higher level by capillary action than if the pore size is large and non uniform. Wicking is important parameter for children fabrics because it is correlated with sweat transmission from the fabric. Fabrics of high wickability can easily transmit sweat from the fabric surface to air.

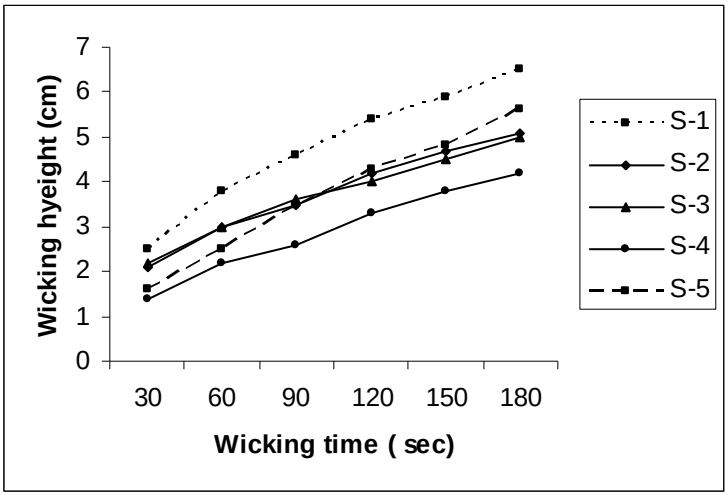


Figure1 Wicking behaviour of Children fabrics

It has been observed from the Figure 1 that Satin fabric which contains high number of floats and sufficient cover show highest wicking rate among all fabrics. Sample S-2 & S-3 show almost similar nature of wicking but 9 to 10% less wicking rte compared to satin fabrics. Sample S-4 shows poor wicking behaviour compared to all sample due to less cover factor and less number of floats. S-5 shows same rate of wicking like sample S-1 due to more number of floats and high cover factor.

Strength properties and bending length

Table 3 Testing parameters of the fabric

Article	Parameters	Unfinished	finish	Bending length (cm)	
				Unfinish	Finish
S-1 (P)	GSM	179	183	12	6-7
	Tear (N/tex)	15/10.8	15.25/40.14		
	Tensile(N/tex)	390/243	276/212		
S-2 (P)	GSM	206	209	14	8 -9
	Tear	13.15/8.40	17.25/35.25		
	Tensile	457/275	415/250		
S-3 (P)	GSM	200	208	13	7-8
	Tear	12/ 13	18/ 33		
	Tensile	370/ 158	350/ 150		
S-4	GSM	135	140	7	4-5
	Tear	15/ 20	47.55/ 64		
	Tensile	200/ 240	159/ 192		
S-5	GSM	207	210	9	5
	Tear (N/tex)	14.5/ 10.5	20.25/ 40.5		
	Tensile(N/tex)	350/ 240	275/ 205		

It has been observed from **Table3** that S-1, S-2, S-3, S-5 show high tear strength and adequate tensile strength because of silicon elastomeric finish and more number of floats in fabrics. Fabric sample S-4 show high tear strength but low tensile strength because of low cover factor. S4& S-5 fabric samples are suppler i.e. less stiffer compared to S-1, S2 & S-3 sample due to less cover factor and more number of floats respectively.

Table 4 Fastness properties of the dyed fabric samples

Fastness specification		S-1		S-2		S-3		S-4		S-5
		Unfinish	Finish	Unfinish	Finish	Unfinish	Finish	Unfinish	Finish	Finish
Color fastness to wash	CC	4	4	4	4	4	4	4	4	4
	CS	4	4	3	3	4	4	4	4	3.5
Color fastness to Crocking	Dry	4	4	3.5	3.5	3.5	3.5	4	4	4
	Wet	3.5	3.5	2.5	2.5	2.5	2.5	3.5	3.5	3.5
Color fastness to water	CC	4	4	4	4	4	4	4	4	4
	CS	4	4	3.5	3.5	3.5	3.5	4	4	4
Color fastness to perspiration	CC	4	4	4	4	4	4	4	4	4
	CS	4	4	4	4	4	4	4	4	4

CC- Color change of the dyed fabric; CS- Color staining on cotton fabric.

It can be observed from the Table 4 that all the dyed finish and Unfinish fabrics show good fastness properties. In case of S-2 and S-3 fabric suffer poor wet crocking fastness and also slight more color staining on cotton compared to other shade. It may be due to the presence of Remazol Turquish Blue G color in both recipes. This particular color has been characterized by large molecular weight due to presence of thalocyanine copper complex[4].

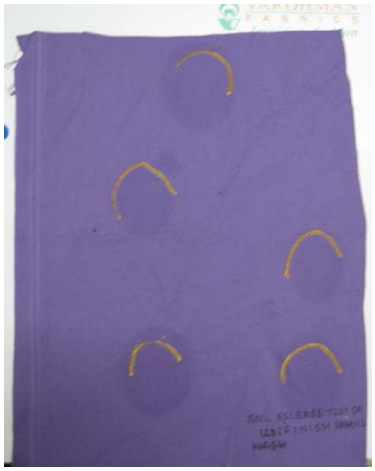
Soil Release test

Soil release finishes on textiles facilitate the removal of oily soils during laundering under common household condition. For soil release property hydrophilic finishes is preffered to low fibre and wash liquid interfacial energy. A low interfacial tension between the oil and the wash liquid will favour the oily soil release[5]. This test has been carried out for all children fabrics. It has been observed from the Figure 2 that all the fabrics show good soil release properties. This may be because of hydrophilic properties of RESIL silicon emulsion which reduces the interfacial surface tension between fibre and wash liquid and help to roll off soil particles. Pictures are shown in the following figure.

S-5 Finish control sample with oil

S-5 Finish sample after wash

S-1 Unfinish control sample with oil



S-1 Unfinish sample after wash

S-1 finish sample after wash

Figure 2 Soil release properties of children fabric samples

Conclusion

The selection of suitable party cloth to the children is imperative to their enjoyment of health and also attractive to everyone. The cloth should be delicate to the skin of the children. Fabrics should be safe and comfortable. So, the construction of the party children garment should be simple, attractive and comfortable.

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Image Courtesy: http://www.kidsoasis.co.uk/