

Research Paper :

An experimental study of some comfort-related properties of fabrics

SHIKHA BHARDWAJ AND SHALINI JUNEJA

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See end of the article for authors' affiliations

Correspondence to:

SHIKHA BHARDWAJ,
Department of Clothing and
Textiles, College of Home
Science, G.B. Pant University
of Agriculture and
Technology, Pantnagar, U.S.
NAGAR
(UTTARAKHAND) INDIA

ABSTRACT

Synthetic fibres are non-biodegradable and through blending of natural fibre, they can be made biodegradable to some extent. The study world proves to be helpful in establishing eco-friendly process in textile world. The plain woven union fabrics have been prepared from three different ratios of blend jute/viscose polyester with cotton. Jute/viscose polyester used 30/70, 50/50, 70/30 ratio in the filling direction and 100% cotton was used in warp direction. Their utility and mechanical properties studied. It was observed that 30/70 jute/viscose polyester union fabric was better. The quaternary blend reduced the cost of the product and it was also used in apparel and furnishing.

Key words : Union fabric, Blending, Weaving properties, Apparel uses

There is no perfect fibre. All fibres have poor characteristics blending, which enables the technician to combine fibres so that the good qualities are emphasized and poor qualities are minimized. One of the objectives of blending is to improve functional properties. The fabrics may be designed specifically to enhance the physical properties. Blend of synthetic polymer with natural fibres offer the most valuable possibilities because the two components are very dissimilar. Blending also makes the fabric manufacturing process economical. The price of man-made is much more stable.

A highly sophisticated textile art, blending today is creating new fabric types, performance characteristics, and dyeing and finishing effect. In blends of polyester or viscose/jute blend with cotton, the synthetic fibres provide crease recovery dimensional stability, tensile strength, abrasion resistance moisture absorption drapability.

Jute also has some favourable properties like high tensile strength, bulk, and good dye ability. Jute also has some drawbacks such as brittleness, harshness to feel, hairiness, rugged appearance, inextensibility and fibre-shedding. Jute has a property of high tensile strength, good dye ability and antistatic property and when it blended with viscose it may provide cheaper substitute for apparel use, decorative, furnishing and other end-use. Jute being much coarser when blended with viscose which has wider choice of fineness will improve the resultant yarn in different parameters including aesthetic values, blending will help diversification of fabric goods. Polyester is known for its wrinkle – free appearance and easy care. The

strength, durability, abrasion resistance, wrinkle resistance shape and size retention of these blended fabrics increase due to polyester. Cotton is a cool, soft comfortable and is the principal clothing fibre of the world. This fabric absorbs and releases perspiration quickly, thus allowing the fabric to “breathe.” Cotton provides absorbency and consequent comfort.

Quaternary blends are normally used for the reasons of economy by explaining name of prestigious fibres or for styling and obtaining special effect. The quaternary blends can be used for the production of yarn with fancy effects after processing with great skill on part of dyer.

METHODOLOGY

Raw material procurement:

- Jute/Viscose Blend – 30:70 %
- Polyester – 100 %
- Cotton – 100%

Jute /Viscose and Polyester yarn were used in weft direction.

Cotton yarn was used in warp direction

Quaternary blend of fabric had plain weave and blend ratio were

- Jute/Viscose 70%and Polyester 30%
- Jute/Viscose 50%and Polyester 50%
- Jute/Viscose 30%and Polyester 70%

Abrasion resistance:

The machine essentially consists of a duo-aluminium plate supported by 3 pillars. On the top of each pillar is a

ball cater, which carries a steel ball in it .These allow the top plate to glide about easily. The top plate has four slots in it and each slot being filter with a sample holder clamp perpendicular to the plate. The mushroom shaped sample holders are able to slide vertical in the horizontal movement on the plate. Each of the sample holders rests upon one of the four small abrading tables whose surface are also flat and parallel to the plate therefore each rubbing on one of these surface. Abrading material emery paper was cut to size of 5x5 squares using the template and was fixed on abrading tables. One specimen from both fabrics were cur to a size of 1½ by using a temperature and were fixed in mushroom shaped holder. Each mushroom shaped holder weighed about 200 g.This weight acts as a pressure to the sample while being abraded. The machine was set on the numbers of cycles and as the machine ran the numbers were decreased.

Pilling:

A piece of fabric measuring 11.4cm x 11.4cm was so sew that it fits when placed round a rubber tube 6 inches long,1.5 inches outside diameter and 1/8 inches thick .after placing the fabric on tubes the tubes were placed in a box(9"x 9"x 9")which was lined 1/8 inches thick with cork. Then it was rotated at 60 rev/min for 5 hours after 5 hours, the fabric was in mounted, seam was opened and the piles were counted.

mouth of a cup containing takes places under standard atmospheric condition and loss in weight of cup after 24 hours was measured and then converted in term of water vapour permeability. The water vapour permeability of the specimen was then expressed as the percentages of water vapour expressed of reference fabric.

Serviceability:

To test serviceability, all the fabrics were washed in washing machine. Total 40 washings were given on the whole, to each of the sample. After 10,20,30,40, washings stiffness strength, weigh per unit area were tested for washing I.S.O test No. 3 was used. The fabrics laundered in a soap solution 5 g soap per litre of water and 2 g of sodium carbonate. The temperature of the solutions was 60°C. Each cycle of washing was done for 45 minutes.

FINDINGS AND DISCUSSION

Table (1, 2, 3, 4 and 5) show that the abrasion resistance (Table 1), water absorbency of the jute/viscose and polyester union fabric 30/70 (Table 2) was higher, water permeability was higher in jute/viscose and polyester 70/30 (Table 3). tearing strength of all the fabrics after 5,10,15,20 washings was decreased (Table 4). After laundering, maximum loss in tearing strength was observed in jute/viscose and polyester 70/30 and minimum loss was observed in jute/viscose and polyester 30/70 (Table 4). Bending length decreased significantly after

Table 1 : Abrasion resistance of the fabric

Sample No.	Jute/Viscose ratio	Polyester ratio	No. of cycles (g)				
			Original	500	1000	1500	2000
1.	70	30	0.188	0.187	0.187	0.185	0.184
2.	50	50	0.186	0.186	0.184	0.178	0.168
3.	30	70	0.198	0.198	0.196	0.196	0.195

Water absorbency:

Water absorbency is a quality of fabric to absorb water. It is a method for measuring the total amount of water that a fabric absorbs. The circular test specimen of 8cm. diameter was immersed in distilled water until it was uniformly wetted out and left overnight sandwiched between two wetted sponges. The original mass and the mass of the specimen after 24 hours was recorded the absorbency expressed as the % of original mass of specimen

Water vapour permeability:

The specimen under test was sealed over the open mouth of a cup containing water. Evaporating the open

Table 2 : Water absorbency of the fabric (ml)

Sr. No.	Jute/Viscose ratio	Polyester ratio	Water absorbency
1.	70%	30%	264.8
2.	50%	50%	247.7
3.	30%	70%	267.9

Table 3 : Water- vapour- permeability of the fabric (ml)

Sr. No.	Jute/viscose ratio	Polyester ratio	Water permeability
1.	70%	30%	5
2.	50%	50%	4.25
3.	30%	70%	2.5

Table 4 : Tearing strength of the fabric (g)

Sample No.	Jute/viscose ratio	Polyester ratio	Original weft	5th weft	10th weft	15th weft	20th weft
1.	70	30	5273	3424	3264	3040	2720
2.	50	50	5299	2540	3424	3360	2880
3.	30	70	5683	3820	3450	3360	3040

Table 5 : Bending length (cm) of the fabric

Sample No	Jute/viscose ratio	Polyester ratio	Original warp weft	5th weft	10th weft	15th weft	20th weft
1	70	30	2.76	2.7	2.5	2.4	2.2
2	50	50	3.15	3.1	2.6	2.5	2.4
3	30	70	3.33	3.3	3.0	2.7	2.5

5,10,15,20 washing. Maximum stiffness was found in jute/viscose and polyester 30/70 (Table 5), There was no pilling found on the surface of the fabric.

Conclusion:

From this study, it was concluded that jute/viscose and polyester 30/70 ratio union fabric was better than other union fabrics. But crease recovery and water absorbency was poor of this fabric but in this fabric cotton was used in warp direction so it was overcome this property. So, it can be used to make furnishing garments and jacket and trouser can be made from this fabric.

Authors' affiliations:

SHALINI JUNEJA, Department of Clothing and Textile, College of Home Science, Banasthali University, BANASTHALI (RAJASTHAN) INDIA

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