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JUTE- ACRYLIC BLENDS

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ABSTRACT

Jute-Acrylic blended fabrics showed improvement in physical properties like bursting strength and crease recovery on mixing with acrylic. Stiffness and abrasion properties are improved on mixing of Jute. Blends were found to be good in texture, luster, woolen feel and aesthetic appeal. Jute fiber has inherent drawbacks like low breaking extension and being coarser, but also has certain desirable properties like bulkiness and eco-friendliness. Whereas acrylic has improved characteristics, fineness, breaking extension and warmth.

Keywords: Jute-Acrylic blended fiber, Jute – Acrylic blended yearns, Jute – Acrylic blended fabrics, American Society for Testing and Materials, Constructional Parameters, Fiber Properties, Yarn Properties, Fabric Properties.

INTRODUCTION

Jute as a textile fiber has inherent drawbacks for functional end uses, but a drive like blending is on to overcome these drawbacks and also to produce quality products to promote functionally acceptable merchandise in domestic and export markets. An important factor which has projected the blended fabrics as dominant textile fabrics, in creating textile fashions and comparatively better utility performance of the fabrics. (Parikh &Aiyer, 1980). The cost of wool is very high. Moreover, Woolen industry is facing problems like short supply of quality wool fiber, trained technician, high cost of production etc. Therefore, experiments are carried out to find some low priced substitutes for knitted fabrics and Acrylic can be one of the substitutes (Vasantha& Jacob, 1993).

MATERIALS & METHODS

Jute of white variety Grade 2 and acrylic were used for the study. Pure acrylic and pure jute along with jute and acrylic blended yarns of composition 10:90, 20:80, 30:70, 40:60, 50:50 were produced from the National Institute of Research on Jute and Allied Fiber Technology, Calcutta. Fibers were tested for fiber fineness, fiber length and tensile

properties of fibers. Yarns were tested for yarn count (ASTM D 17059-87), twist and tensile properties (ASTM D 2256-66). Yarns were plain knitted on Round Machine with 9 inches diameter (without dial) at TITS Jute Extension Centre, Ludhiana (Punjab). Subject evaluation from 30 experts was undertaken to assess the consumer acceptability regarding fabric samples. Three-point scale was made as a tool for subjective evaluation to assess the characteristics, including texture, aesthetic appeal, overall appearance and woolen feel.

The Preferences given by the respondents were assigned 3,2 and 1 scores as good, medium and poor respectively.

Table 1
Analysis of Fiber Properties

Fiber Type	Fineness (Tex)	Average fiber length (mm)	Tenacity (g/tex)	Breaking elongation (%)
Jute	1.8	200	28	1.1
Acrylic	0.33	100	40	21.8

Table 2
Analysis of Yarn Properties

Sample	Yarn J/A	Yarn (tex)	Twist (tpi)	Single yarn breaking strength (g)	Breaking elongation (%)	Tenacity (g/tex)
A	0:100	100	5.64	1510	28.1	15.1
B	10:90	110	6.25	1397	25.0	12.7
C	20.80	120	5.48	1344	22.7	11.2
D	30.70	125	5.04	1287	20.1	10.3
E	40:60	125	4.45	1187	11.9	9.5
F	50:50	130	3.72	1066	7.2	8.2
G	100:0	140	4.45	966	2.0	6.9

J = Jute
A = Acrylic

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Table 3

Consumer's acceptability of Fabrics

Fabric feel	Test fabrics	Texture	Luster	Aesthetic Appeal	Woolen Feel
Code	J:A	WMS	WMS	WMS	WMS
A	0:100	3.0	2.8	3.0	3.0
B	10:90	2.8	2.8	3.0	2.8
C	20:80	2.6	2.7	3.0	2.6
D	30:70	2.6	2.6	3.0	2.5
E	40:60	2.0	2.5	2.8	2.0
F	50:50	1.2	1.9	1.9	1.5
G	100:0	1.0	1.6	1.5	1.0

WMS = Weighted mean score

0-1.0 = Poor

1.0-2.0 = Medium

2.0-3.0 = Good

RESULT AND DISCUSSION

Results revealed that the jute fiber has very low breaking extension as compared to that of acrylic fiber, as shown in Table 1. Besides it is about three times coarser than acrylic and has lower tenacity at break. Therefore, by blending with acrylic fiber; jute is found to have improved properties.

It is evident from Table 2 that yarn court, yarn breaking strength, breaking elongation decreased with the addition of jute.

Data on consumer acceptability is shown in Table 3. It is evident from the table that A (100% acrylic), B(J:A/10:90), C (J:A/20:80), D (J:A/30 : 70) and E (J:A/40:60) fabric samples were found to have good texture, luster, aesthetic appeal and woolen feel, whereas fabric F had poor texture and medium luster, aesthetic appeal & woolen feel.

But G (100%) had poor texture luster, aesthetic appeal & woolen feel.

CONCLUSION

Jute fiber has inherent drawbacks like low breaking extension and being coarser, but also has certain desirable properties like bulkiness & eco-friendliness. Whereas acrylic has improved characteristics like fineness, breaking extension and warmth. Therefore, blending of jute with acrylic is found to improve the properties of both fibers.

Blended yarns of composition 20: 80 &30: 70 (J: A) have tenacity and breaking extension similar to that of a commercial knitting yarn – Cashmilon Mayura. Hence these blends are recommended as knitting yarns.

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