STUDY OF CAUSTIC SODA APPLICATION ON DIVERSIFIED FABRIC FOR FURNISHING AND APPARELS FABRIC

NAZMINA CHOWDHURY [1], S.M. AZHARUL ISLAM [2], M. ASADUZZAMAN [3] and ABUL KALAM AZAD [4]

[1] Senior scientific officer; Pilot Plant and Processing Division, Bangladesh Jute Research Institute, Manik Mia Avenue, Dhaka - 1207,Bangladesh, [2]Professor; Physics Department, Jahangir Nagor University, Savar, Dhaka, [3]Principal scientific officer; Bangladesh Jute Research Institute, Sher-e Banla Nagar, Manik Mia Avenue, Dhaka. [4] Chief scientific officer; Bangladesh Jute Research Institute, Sher-e Banla Nagar, Manik Mia Avenue, Dhaka, Bangladesh

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ABSTRACT

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The performance efficiency of furnishing & apparels fabric after caustic soda treatment produced in the wet processing department of the pilot plant and processing division, Bangladesh Jute Research, Institute, Dhaka, Bangladesh during 2007 to 2009 to develop scientific and technological processing techniques for producing new jute products-novo cell yarns for diversified fabric uses as furnishing and apparels and to study their techno-economic suitability.

Keywords: Novo cell yarn, woolenisation, bleaching and dyeing

INTRODUCTION

Jute is the cheapest natural commercial fiber (Whytlaw, 1952). It is mainly used in manufacturing packaging and coarse fabrics such as hessian, carpet-backing and sacking etc. due to its cheapness, high strength, flexural rigidity, bulk and elastic properties. It had practically enjoyed monopoly in this field until the middle of sixties. Since then synthetic products and bulk handlings started occupying sizable share of jute market. It has, therefore, become necessary to find out alternative uses of jute for retaining the economic viability of jute industry and thereby supporting millions of people who live on it. Jute fiber conventionally is not being used in producing textile products as it has some short comings in regard to feel, appearance, drape, coarseness, crease resistance, wash ability and abrasion (Shahabuddin, 1994).

The idea to have excessive reliance on the production of conventional products like hessian, sacking and carpet backings etc. should be revised in the recent crisis of jute industry and more in the face of the challenge from newly developed rival synthetic products (Kassem, 1992).

Jute fiber and its diversified products for sophisticated textile uses have to undergo some chemical processing in wet stage. On chemical processing of jute, there is slight loss of strength occurred and a stage comes when the constituents are disintegrated with complete loss of fiber quality. So, in the chemical processing of jute fiber materials this aspect is to be taken care of (Kamal, 2005).

By this experiment treatment of caustic soda for producing new jute products-novo cell yarns for diversified fabric for furnishing and apparels have been performed.

MATERIALS AND METHODS

Two plied of 7.5 lbs/spy of 100 % jute, jute-acrylic (90:10 & 80:20) blended yarns were chemically modified with caustic soda in relax state and consequently bleached, dyed and finished for the production of novo cell yarn in order to produce diversified fabrics for furnishing and apparel uses. It was then bleached, dyed and finished for the production of furnishing/apparel fabric.

PRODUCTION OF NOVOCEL–YARNS

Two plied of 7.5 lbs/spy of jute and jute blended yarns was treated with 20 % caustic soda solution at30^0C temperature in an open vat and hydro extracted. Then bleached with hydrogen peroxide (35 %) along with necessary auxiliaries. The woollenised and bleached yarns were then dyed with reactive dyes to produce different color shades.

RESULTS AND DISCUSSION

Table 1. Physical properties of novo cell dyed yarn after caustic soda application

Yarn Specifications	Caustic soda solution pick-up (%)	Weight Loss (%)	Strength Loss (%)	Extension at break (%)		Fastness	
				Original Yarn	Novo cell Yarn	Wash	Light
Jute 100%	150-165	20.00	46	3.0	18.0	5	4-5
Jute/Acrylic 90/10	160-165	18.00	40	2.5	15.5	5	4-5
Jute/Acrylic 80/20	120-135	16.00	42.5	4.5	13	4-5	5

Table 2. Physical properties of diversified furnishing/apparel fabrics

Fabric Specifications	Dyed Yarn Numbers/cm		Thickness	Breaking Strength		Luster	Abrasion Resistance	Fastness		
	warp	weft		warp	weft		(rev)	wash	light	rub
Original 100 % Jute	12	9	1.205	52.03	52.83	56.92	4000	-	-	-
Finished Blended (90/10)	14	7	0.230	54.02	70.05	75.59	4530	4-5	4-5	4-5
Finished Blended (80/20)	16	8	0.235	56.05	76.03	80.00	4750	4-5	4-5	4-5

The pick- up % of caustic soda by jute yarns and its blend with acrylic fiber after treatment with caustic and hydro extraction are placed in table-1. This pick-up is varied depending on the process of hydro extraction and characteristics of yarn quality. It was also observed that weight loss and tensile strength of different novo cell yarns varied from 18-20 % and 47-48 % respectively. This may be due to the removal of hemi-cellulose and lignin present in jute fiber. It is known that greater the extensibility the better is the woolenisation effect which was observed in case of 100 % woollenised jute yarns, washing and light fastness of the dyed yarns.

In the production of furnishing fabric,100 % jute yarn 7.5 lbs/spy was used as warp and blended yarns jute-acrylic (90:10 & 80:20) was used as filler. From the table-2, it was observed that warp way strength of the fabric increased from 3.7-7.2 % & the loss of weft way strength decreased to 25-30 % which is due to cause of caustic treatment, bleaching, dyeing and finishing. The luster of the furnishing fabric is also increased & it varies from 25-29 % as applied fatty based softener to improve the hand feel. It was also found that abrasion resistance of the furnishing fabric is also higher than the grey, is quite suitable. Fastness property- washing, light and rubbing of the dyed furnished fabric were found satisfactory. The above parameters, placed in table-1&2 indicated that the physical properties of the furnishing fabric are quite satisfactory than the grey fabric.

CONCLUSION

Novo cell yarns was produced from 100 % jute, jute-acrylic(90:10 & 80:20) blended yarn by means of chemical modification followed by dyeing with reactive dyestuffs and finished for diversified apparel designed fabric. This fabric properties like caustic soda pick-up, weight loss, strength loss, extension at break, luster, abrasion resistance and dye fastness properties to washing, light and rubbing including shade tone uniformity etc. were satisfactory.

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