

EFFECT OF WASHING ON WEIGHT AND STRENGTH OF MECHANICALLY PRODUCED BLENDED AND 100% COTTON CURTAIN

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Abstract : A research had been taken to find out the suitability of blended curtain in respect to the property of 100% similar cotton curtain. Here, two main factors viz. wt. and strength are taken in to account considering the effect of washing on it. From the test results, it is shown that 50:50/ jute: cotton blended curtain is comparable to the 100% cotton curtain of Tk. 90 /meter. Even better than the properties of 100% cotton curtain of Tk. 60/ meter.

Keywords: Jute, Cotton, Washing, Strength, Blended, Mechanical, Weight, Curtain.

1 Introduction

Jute and Cotton both are natural fibre. Jute is a bast fibre. It is also the golden fibre of Bangladesh. It is a cash crop. It is a commercial fibre, too [1]. Jute has various inherent characteristics like high tensile strength, low extensibility, long durability, luster and long staple length [2]. Jute is the cheapest natural fibre which products are highly in demand both in the domestic as well as foreign markets [3]. Generally jute is used as traditional jute goods like bag, sacks, Hessian, CBC etc. Jute is also used as a household products viz, carpet, curtain, mat etc. in a very small scale. Due to limited use of jute, the production/cultivation of jute is decreasing day by day. To increase the production/cultivation of jute, its diversified use has to be increased. Upgraded products like curtain, sofa cover, bed sheet, bed cover etc. have to be produced from the jute to enhance its utility in the society. Considering all the properties of jute and jute goods, jute blended curtain has an immediate possibilities to increase the diversified use of jute [4]. Blending of jute with cotton is not a new idea

in the cotton processing system [5,6]. Several aspects are related to the blending. Among them cost minimization is an important factor. Due to blending the cost of the product reduce to a minimum level. There are also other factors, such as processing parameters, machine efficiency and availability of raw materials etc. related to the cause of blending [7]. Jute-Cotton blended curtain has been produced to find out whether the jute based curtain is acceptable or comparable to 100% cotton curtain or not, which belongs to the decorative group.

2 Materials and Methods

2.1. Fabrics: Blended fabrics. 100% cotton curtain.

2.2. Collection of jute and cotton fibre : Jute fibre and 100% cotton fabrics were collected from the local market. At the same time, we collected various sample of Jute: cotton (40:60), (50:50), (60:40) and 100% cotton curtain for the tests.

2.3. Experimental procedure: The jute-cotton blended yarns (40:60), (50:50), and (60:40) were collected from jute and Textile product Development Centre (JTPDC) of Bangladesh Jute Research Institute (BJRI). The warp yarns were properly sized with 8% starch on the weight of the material to increase the strength of the yarn. The hairiness of the yarns was also minimized by the sizing materials. Due to proper sizing the warp yarn breakage reduced to a minimum level during friction of the yarn. The warp yarn beam was produced in the weaving department of BJRI. The weft yarns were used without using size material

because of less tension and friction. The pirn of weft yarn was prepared by the pirn winding machine of JTPDC.

A normal power loom was used for the production of blended curtain fabric. The fabrics were produced in standard condition of humidity and temperature. As the blended curtain fabric has to be compared with the 100% cotton curtain fabric, the blended fabrics were finished in a

commercially processed fishing mill in Tejgaon, Dhaka, Bangladesh. No chemical finishing agents are used except size material.

Only mechanical finishing processes are performed for curtain fabrics. After printing, the curtain fabrics were heat set by the stentering machine followed by calendaring for finishing. Almost similar to blended curtain fabric, 100% cotton curtain fabrics were collected from the local market.

3 Results and Discussion

Test results of different jute-cotton blended curtain and 100% cotton curtain fabric are shown in following table.

Table 1 Effect of washing of blended and 100% cotton curtain.

Sample Type	Ends/inch	Picks/inch	Warp count	Weft count	Wt. of fabric before washing (gm)	Wt. of fabric after washing (gm)	Wt. loss (gm)	Wt. loss (%)
Jute : cotton Blend (60: 40)	36	16	12	10	256	205.2	50.8	19.84 %
Jute : cotton Blend (50: 50)	44	18	12	10	236	215.5	20.5	9.88 %
Jute : cotton Blend (40: 60)	46	19	12	10	210	190	20.0	9.52 %
100% cotton curtain-Tk 60/meter	64	30	32	10	162	145.2	16.8	7.32 %
100% cotton curtain-Tk 90/meter	58	31	46	10	252	248	4.0	1.58 %

The effects of washing on weight of jute-cotton blended and 100% cotton curtain fabric are shown in the following Fig.1

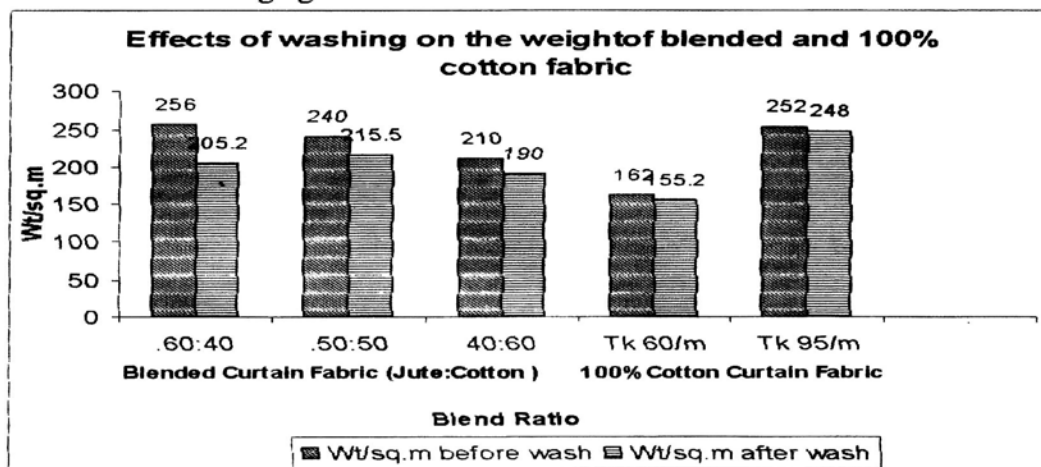


Fig. 1 Effect of Washing on the weight of blended and 100% cotton fabric

In the Fig.1, horizontal and vertical lines indicate the blend ratio and wt./sq.m

respectively. From this figure, it is seen that wt./sq.m of 60:40, 50:50 and 40:60 jute-

cotton blended curtain fabric is 256 gm, 240 gm and 210 gm respectively. After normal wash it comes down to 205.2 gm, 215.5 gm, and 190 gm respectively. In the case of two types of 100% cotton curtain fabric, it is seen that wt./ sq.m of 100% cotton (Tk. 60/meter) before and after washing was 162 gm and 155.2 gm. This wt. is lower than the wt. of each type of blended fabric. On the other hand wt. of 100% cotton curtain (Tk 95/meter) before and after washing is 252 gm and 248 gms. This wt. is higher than the wt. of another type of 100% cotton curtain fabric. It is also seen from the above figure that the wt. of costly 100% cotton curtain fabric was higher than the wt. of another types of blended curtain fabrics. It is also clear that there was a loss of wt. after for each type of curtain fabric (either blended or 100% cotton).

Curtain is a decorative fabric. It must be washable after certain used. Again higher wt. curtain is preferable than lower wt. curtain. The wt. of the curtain depends on the material and the thickness/construction of the curtain fabric. The wt. also depends on the starch use on the yarn during weaving the curtain fabric [8]. From the result of blended curtain fabrics, it is seen that the wt. of 50:50 jute:cotton

blended curtain fabric was higher than the 40:60/ jute: cotton blended curtain fabric and lower than the 60:40/jute: cotton blended curtain fabric.

But the loss of wt. for 50: 50/jute: cotton curtain fabric is minimum and lower than the other two types of blended curtain fabric. The wt, of 50:50/ jute:cotton fabric was higher than the wt. of 100% cotton (Tk.60/meter) fabric and lower but comparable to the wt. of 100% cotton curtain (Tk 95/meter) fabric. Higher amount of starch is used during weaving of jute-cotton blended fabric than that of the weaving of cotton fabric [9]. That is why; the loss of wt. is minimum for both types of 100% cotton curtain fabric and maximum for each type of blended curtain fabrics. The weight of the fabric not only depends on the pick up% of size material but also the raw material and construction of the fabric. Hence blended fabric may be heavier than 100% cotton fabric.

3.1 Effect of washing on strength of 100% cotton & blended curtain:

The effect of washing on warp wise and weft wise strength of the fabrics are shown in the following Figs. 2 & 3.

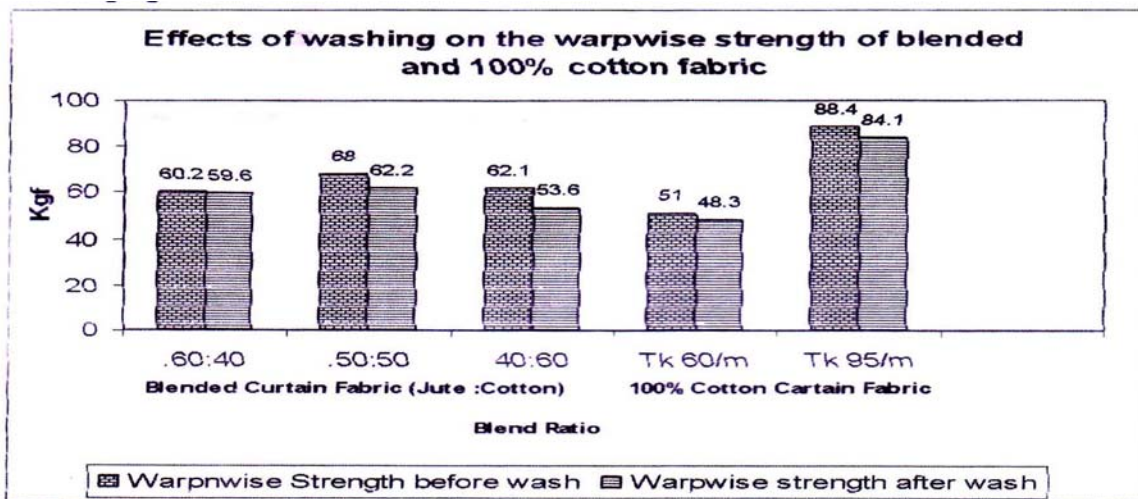


Fig. 2 Effect of Washing on the warp wise strength of blended and 100% cotton fabric

From the above Fig.2, it is seen that warp-wise strength of 60: 40/ jute: cotton blended fabric before and after wash is 60.2 kgf and 59.6 kgf. For 50:50/jute:cotton and 40:60/ jute:cotton blended curtain fabric was 68 kgf & 62.2 kgf

and 62.1 kgf & 53.6 kgf respectively. In each type of blended curtain fabric, the strength has decreased after washing. Before and after washing for 100% cotton curtain fabric (Tk. 90/ meter) were 88.4 kgf & 84.1 kgf. It is seen

that the strength of 100% cotton curtain fabric (Tk. 90/meter) was higher than another 100% cotton curtain fabric and other three different types of blended curtain fabric.

Strength of the curtain is not so important as wt. of the curtain. But curtain has to be washed after certain use. So, loss of strength after washing is a considerable factor for curtain. Here among the three blended curtain fabric 50:50 blended curtains shows the higher strength than that of the other two types of blended curtain fabrics. Even after washing, the loss of strength is minimum and higher strength than the original strength of the other two blended fabric [10]. The strength of 50:50/Jute-

cotton blended fabric was also higher than the strength of 100% cotton curtain fabric {Tk.60/meter). This has been possible due to higher wt./sq.yd (high thickness) of 50:50/jute:cotton blended fabric than the 100% cotton fabric (Tk 60/meter). The strength of 100% cotton fabric (Tk.95/meter) was also higher than that of the 50:50 blended curtain fabric due to the higher wt./sq.yd of 100% cotton fabric (table-1). It is also seen that in case of both type 100% cotton curtain fabric, the loss of strength after washing was minimum and this was happened due to inherent properties of cotton (in wet stage cotton is stronger than jute fibre).

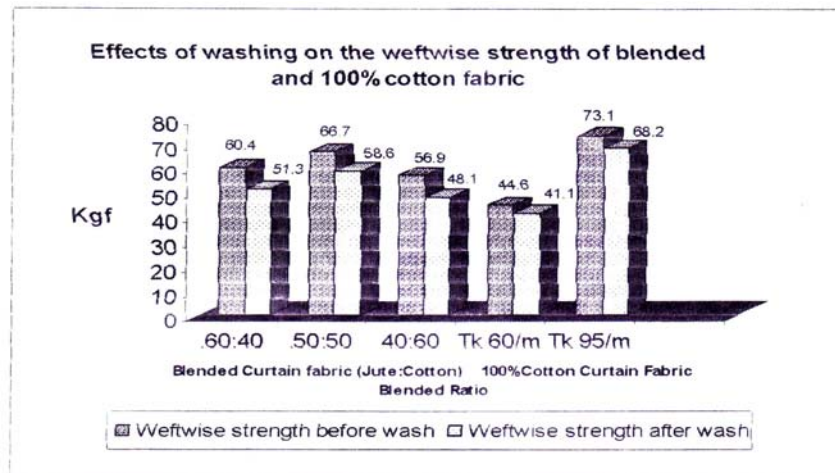


Fig. 3 Effect of Washing on the weft wise of blended and 100% cotton fabric

From the above Fig.3, it is seen that before and after washing the strength of blended curtain fabrics (60: 40),(50:50), (40:60) were 60.4 kgf and 66 kgf, 66.7 kgf, 56.9 kgf & 51.3 kgf & 58.6 kgf, 48.1 kgf respectively. Before and after washing, the strength of 100% cotton curtain fabric was 44.6 kgf, 73.1 kgf and 41.1 kgf, 68.2 kgf respectively. It is seen that for each blended curtain fabric the loss of strength were almost the same after washing. But the loss of strength for each type of 100% cotton curtain fabric were similar to each other. Here it is also seen that weft-wise strength. loss after washing was more than the warp-wise strength loss. Washing was only performed with normal detergent. After second wash, the properties were almost the same as the 1st wash and did not go for the 3rd wash.

4 Conclusion

The wt. and strength are the important properties especially for the curtain. The percentage of wt. loss for 50:50/jute:cotton blended curtain is comparable to the 40:60/Jute:Cotton and 100% Cotton curtain of Tk. 60/meter. In the case of strength, warp wise strength loss is minimum than weft wise strength loss for both blended and 100% cotton curtains. Here, the weft- wise and warp-wise strength loss for 50:50/Jute:Cotton curtain is comparable to 100% cotton curtain as well as 40:60/Jute:Cotton blended curtain. As inherently jute losses more strength in weight stages than dry stage, hence it is suggested to avoid repeated washing specially of jute-cotton blended curtain, but definitely increase the stiffness and appearance after using starch and calendering. So, considering

the two main factors (wt. and strength) 50:50/Jute:Cotton blended curtain may be the replacement of 100% cotton curtain of lower prices (Tk.60/meter).

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