

# Study on Different Properties of Jute-Cotton Blended Home-Textile Check Fabric

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**ABSTRACT:**Jute fibre was known as the golden fibre of Bangladesh. It is consisting of varieties of qualities such as eco-friendly, biodegradable, and multipurpose of end uses. The problem arises whenever the jute cotton blended fabric is compared with other fabric properties based on physical parameters such as count variation, GSM, rubbing fastness found that poor qualities of the tests result. In this paper, the jute cotton blended home textile fabric is focused to observe the physical properties of the blended check fabric. In this investigation, it was found that count variation not so high in warp direction 30 Ne and weft direction the count was 10 Ne which is good comparing to other non-woven check fabric. Overall, all tested result of different properties of the home-textile check fabric found are overall good. The GSM cutter machine also gives 140 GSM as a good quality of fabric. Finally, the rubbing fastness of the check fabrics show level  $\frac{3}{4}$  in dry medium and wet medium as well. Overall, all the tested results shows that the home textile fabric carries good physical properties and applicable for the different decorative purposes.

**KEYWORDS:**Blended fabric, structural properties, physical properties, fastness properties etc.

## I. INTRODUCTION

Jute is verily wide known and cash crop in our country [1]. Nowadays, its accessibility is increasing in a wide range to the follower of eco-friendly cost-effective product users. Hence, the fibre of this jute yarn is accepted as a golden fibre [2]. However, the modification of jute yarn is trending toward the diversified application of the end uses [3]. One of the top research is to make the jute yarn as woolenized form to increase its versatile application [4]. It is bast fibre as a form of two

species such as Tossa jute and white jute. Jute is consisting high specific properties, less abrasive behavior, good dimensional stability and good drapability. Presently, it is used as a zeo-textile product in road and highways also rural pavement construction [5]. Every day, more people are using this product to protect the environment from the effects of synthetic goods [6]. Combining jute with cotton is a method for improving each fiber's shortcomings. The method of fiber combining is what draws attention to the fibers' positive attributes and dismisses their negative ones [7]. It also increases the efficiency of the cloth manufacturing process. Today, the demand for diversified jute uses and better quality is rising in the jute industry for use in a variety of applications, including floor coverings, home textiles, technical textiles, handicrafts, etc. [8]. Blending is a method for getting around a fiber's weak points [9]. It is the method of combining fibers that highlights the positive characteristics and reduces the negative characteristics of the fibers. It also increases the efficiency of the cloth manufacturing process. One example of it is yarn made from a jute-cotton hybrid [10]. Jute diversification may be acceptable through the production of value-added goods by blending it with cotton fiber. The beautiful golden appearance, great toughness, and good characteristics of jute fibers are only a few of their benefits. Therefore, the methods of blending and softening could be applied to improve the quality of jute and thereby create a new class of jute-based fabrics with a growing market both domestically and abroad [11].

In the present work, a few characteristics of jute cotton blended check fabrics have been evaluated. Fabric produced from the blended yarn might have better characteristics than what could be

obtained in a fabric produced from a single fiber. The blending of cotton is done to develop drape properties, lusture and uniformity etc.

## II. MATERIALS AND METHODS

In this study, the main material of our program is jute-textile blended home-textile check fabric (Fig.4) and it was collected from the show room of jute- textile wing.

**Count of the yarn used for making the fabric:**Count of the yarn used to produce the jute-cotton blended check fabric was measured by weight and balance method. Both warp and weft yarns were frayed from the fabric of a fixed length. Then the weight of samples was measured by electric balance (Fig.1) and the count was calculated in the indirect English cotton count system.

**G.S.M. of the fabric:** The weight of per square

meter of a fabric in gram is called G.S.M. of fabric. The G.S.M. of the check fabric was measured by using G.S.M. cutter (Fig.2) and electric balance of the servicing and testing lab of Jute-Textile Wing.

**Rubbing fastness of the fabric:** The rubbing fastness or the Crocking fastness of the check fabric was measured by using Prowhite rubbing fastness tester according to ISO-3 (Fig.3). The check fabric sample was rubbed by the rubbing head with crocking cloth both for dry and wet rubbing procedure.

The jute sample yarn was dyed under dyeing lab to bring out the sample size according to the mechanical test parameter. All yarn samples were kept under standard laboratory conditions ( $20 \pm 2$  °C and  $65 \pm 2\%$  RH) for 24hrs before testing as per ISO 139. The sample were tested to measure the Tensile strength (Fig.1),Elongation, Tenacity, Quality ratio, CSP according to ASTM method.



Figure 1. Electronic balance



Figure 2. GSM cutter



Figure 3. Crock meter



Figure 4. Home textile check fabric

### III. RESULTS AND DISCUSSION

Count: Count is the numerical expression that expresses the coarseness or fineness of the yarn. The Textile Institute defines the yarn count as the “number indicating the mass per unit length or the length per unit mass of yarn. There are two types of yarn count systems, i.e., direct, and indirect count; jute yarn count belongs to the direct count system. The number of weight units per length unit is the yarn count in this system. The mass per unit length is indicated by the count number. As a result, the greater the count, the coarser the yarn. The length of the yarn is fixed under the direct count system, but the mass of the yarn fluctuates depending on its fineness.

The formula for deriving jute count is given below:

$$N = \frac{l \times W}{L} \times 100\%$$

Here, N = count of yarn.

W = The weight of the sample (pounds).

L = The length of sample (yards).

l = The unit length of the sample (yards).

The count of every step of yarns was measured by the count measuring instrument of the experimental spinning mill of BJRI. It can be observed from the figure 5 that the count variation of warp and weft is more gape between the quality of yarn. The warp count average is 31 Ne but the waft count is 10 on average.

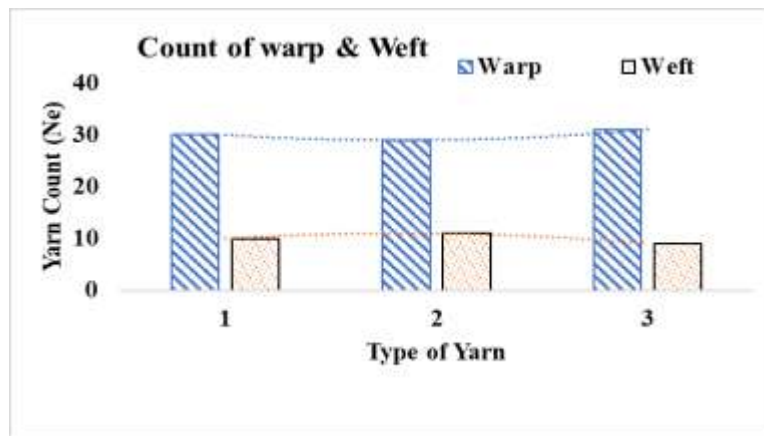


Figure 5: Yarn count variation in warp and weft direction for home textile check fabric

#### G.S.M. of the fabric

The result of G.S.M. of the home-textile check fabric is shown in Figure 6. It exhibits that GSM result of this home textile fabric gives more or less same result in both medium 140 gram square meter.

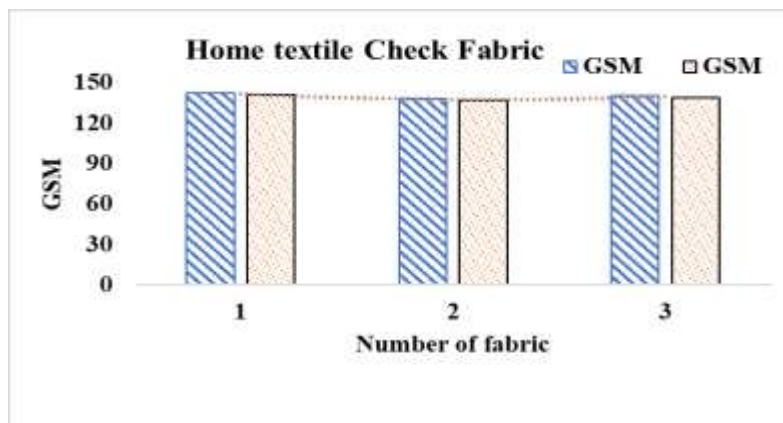


Figure 6: Effect of different processes on the extension at break of the yarn at different counts

In this study, the grey fabric and printed fabric were treated under the crock meter machine (Fig.3) to measure the rubbing fastness in both medium that is wet and dry medium.

Table 1. Rubbing fastness test results in a dry and wet medium

Rubbing Fastness	Grey Fabric (grading)	Fabric (grading)
Dry Scale	3	3
Wet scale	3	4
Cycle	20	20

The home-textile check fabric sample gives very good to good results in rubbing fastness test in dry state both in staining and color change gray scale.

In case of wet rubbing, the staining property and color property lies between good to moderate.

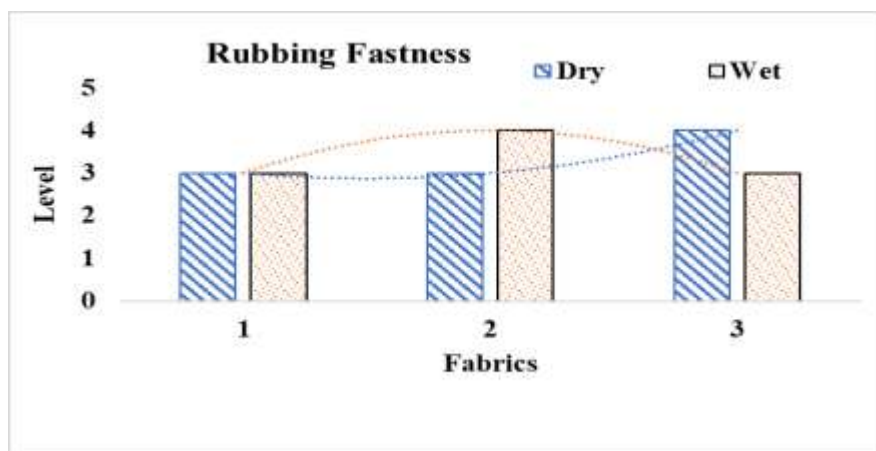


Figure 7: Effect of different processes on the Quality Ratio(Q.R.) of the yarn at different counts

### I. CONCLUSION

In this study, the result reveals that tested result of different properties of the home-textile check fabric found are overall good. The count variation of warp and weft yarn is comparatively better, the GSM cutter machine also gives 140 GSM as a good quality of fabric. Finally, the rubbing fastness of the check fabrics show level ¾ in dry medium and wet medium as well. Overall, all the tested results shows that the home textile fabric carries good physical properties and applicable for the different decorative purposes.

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