A Potential Approach to Analyze the Optimum Characteristics of Cotton/Modal & Cotton/Viscose Blended Yarn

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Abstract

The demand of blended yarn has been increasing gradually due to some of its distinctive properties. It is a challenging task for textile technologists to ensure the appropriate blend composition and blending ratio for the developments of the spinning industry. We should reduce dependency from natural fiber as their properties are not adequate in advancing textile industry and so they are used together in blends with synthetic fibers to compensate their limitations. The aim of this research work was to study the comparative properties of cotton/viscose and cotton/modal blended yarn. Cotton was blended with viscose and modal fibers separately in 50/50 ratio. Blending was carried out at draw frame, and finally 31/1Ne blended yarns were produced. The yarn properties such as unevenness, imperfection, hairiness, single yarn strength (cN/tex) and bundle yarn strength (CSP) were tested, and their comparative results were analyzed. Cotton/modal 50/50 blended yarn showed significantly better properties than the cotton/viscose 50/50 blended yarn.

Index terms— blended yarn, IPI, hairiness, SFC, viscose, modal, etc.

1 Introduction

lending in the cotton spinning process has the objective to produce a yarn with acceptable quality and reasonable cost. A good quality blend requires the use of adequate machines, techniques to select bales and knowledge of its characteristics [1]. Blending different types of fibers is a widely practiced method of enhancing the performance and the qualities of a fabric [2]. The blending of different fibers is a standard practice in the spinning industries. The blending is essentially done to enhance the characteristics of resultant fiber mix and to optimize the cost of the raw material. The properties of blended yarns generally depend on the properties of the constituent fibers and their compatibility. Moreover, the proportion of fibers in the blend also plays a significant role. [3]. Natural fibers and their blends with synthetic fibers bear valuable characteristics, so at present, there are various products made of these fibers. It determines that absorbing and discharging moisture, non-irritating, antibacterial, anti-allergic, protection against the sun's harmful Ultra Violet rays and other valuable properties are better than classic yarns. They may be used for clothing, underwear, socks, hygienic, textile products as well as for composites ??4]. The blending of different types of fibers is a widely practiced means of not only enhancing the performance but also the aesthetic qualities of textile fabric. Blended yarns made from natural and synthetic fibers have the particular advantage of successfully combining the satisfactory properties of both fiber components, such as the comfort of wear with easy care properties. It also permits an increased variety of products to be made, yielding a stronger marketing advantage [5]. There is a problem in fiber blending technology of selecting specific types of fibers and blend ratios depending on the final product [2]. There are different types of fibers are used to produce blended yarn. Such as Cotton-Viscose, Cotton-Modal, Cotton-Polyester. The degree of orientation of regenerated cellulose fibers depends on stretching during spinning [6].

2 II. Material & methods

Cotton is the common blending component used here. Variable elements used here with cotton were viscose and modal fiber. The fiber parameters were tested in AFIS & HVI machine in a standard testing condition (Temperature 20 0 ±2 0 C & Relative Humidity 65±2 percent) [7]. Fiber properties and country of origin shown in table 1. Here, Draw frame blending was applied. Sliver blending gives excellent blending evenness along the length of the product [8].

III. The strength of viscose fiber is lower than modal fiber. It creates short fiber which leads to more unevenness in cotton/viscose blend yarn. As the strength of the modal fiber is same as cotton fiber, so unevenness found lower in cotton /modal blend yarn. The short fiber content in different stages is given in fig. **??** Fig. **??** Modal fiber strength is higher than viscose, so cotton /modal blended yarn showed greater strength than cotton /viscose blended yarn.

3 Result and Discussion

4 Conclusion

The results of this work reveal that cotton/modal blended yarn shows better properties than cotton/viscose blended yarn. Though viscose and modal both are regenerated cellulosic fiber, the strength of viscose fiber is lower than modal due to higher molecular weight of modal. When viscose blends with cotton, it creates short fibers and neps during the spinning process. Apart from these, the movement of viscose fiber during drafting is not as much controllable as in case of modal fiber. For the above-mentioned reasons, the cotton/modal blended yarn quality is better than cotton/viscose blended yarn. Investigation of friction properties of yarns from natural fibers. Mechanics, 75 (1), 73-77.

Viscose creates more short fibers while processing, so hairiness of cotton/viscose blended yarn is more than cotton/modal blended yarn. Short fiber content of different stages is showed in fig. **??** [1]

1

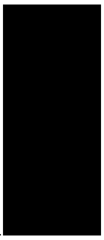

Figure 1: Fig. 1 :

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Figure 2: Fig. 4 :Fig. 5 :Fig. 6 :

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Figure 3: Fig. 7 :

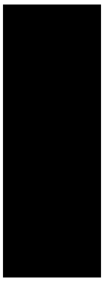

Figure 4:

4

Figure 5: Hairiness 4 .

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Properties	Cotton	Viscose	Modal
Fineness	4.30 ?g/inch	4.31 ?g/inch	4.31?g/inch
Upper quartile length(UQL)	28 mm	38 mm	38 mm
Strength	28.83 gm/tex	15gm/tex	30 gm/tex
Country of origin	Mali & Senegal	Indonesia	Thailand

Figure 6: Table 1 :

4 CONCLUSION

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U% & CV%

11.15 14.26 fiber and neps during processing which creates more 10.55 13.48 0 2 6 10 12 14 16 IP

7 8 9 10 11 12

10.7 10.8 10.2 AFIS short fiber content 11.2

6
5

Drawframe-1 Drawframe-2 Drawframe-3

Figure 7: :

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