

Effect of blending ratios for some non-local cotton on mechanical and physical properties of yarns and fabrics produced”

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Abstract:

Mixing different types of fibers are widely applied to enhance the product's functional performance, where cotton occupying the first place for textile fibers. Yarns blended from different natural fibers can enhance the economy and allow a diversified increase in products which may result in stronger marketing advantages. This study was conducted specifically to study the effect of the method and proportions of blending three types of different cottons on the construction of the yarn, as well as the quality characteristics of the yarns spun using the ring spinning method, depending on the Beninese cotton, Greek cotton, and American cotton, by immediate some tests on the production yarns and the fabrics manufactured from those yarns. Where the count of yarns 12Ne, 16Ne, and 20Ne will be produced, practical experiments were carried out at the "Rose Yarn" spinning company in Beni-Suef aera, and the quality characteristics of the blending ratios depended on the blending method on the blow-room, to reach the best blending ratio that contributes to solving the production problem in the factory. Cotton is one of the most important natural textile raw materials used in the textile industry, especially in the manufacture of ready-made garments, because of the qualities and characteristics that it contains that make it suitable for most functional performance in the textile industries, and given the increasing need for cotton material with the insufficient availability of agricultural areas that are decreasing, which arranges It has to increase the need for the cultivation and production of cotton as a natural raw material, so the alternative is the tendency to mix the different types of cotton, in an attempt to fill the deficit due to the need for fibers suitable for the manufacture of textiles. And the trend began to the idea of mixing the fibers, an attempt to obtain the best properties by adding new properties through the blending process of natural raw materials. By improving the properties, an economic goal is achieved resulting from reducing the economic cost of the product within the permissible limits in the blending ratios. Therefore, the study focused on developing a description for each product of blending between the three cotton raw materials on the Blow-Room line, as well as determining the best properties of the blended yarns. **Research problem:** The properties of blended fabrics are greatly affected by the type of filaments used and the percentage of each of them in the mixture, as many problems may arise in the production of a mixture with functional properties that are not commensurate with the nature of the use of these fabrics. The main problem in blending is the distribution of the mixed hairs in the yarn, and the extent of the homogeneity of the distribution of these hairs in the yarn and their impact on the properties of the product, whether it is yarn or woven. In view of the high prices of local (Egyptian) cotton in the production of thick yarn count (12Ne, 16Ne, 20Ne), which can be produced from blending other cottons with a short fiber length. In addition to the low price compared to Egyptian cotton, and the difficulty that spinning factories face in producing thick yarns from those short-staple fibers, it was necessary to conduct this study in order to determine the best blending ratios of the cotton under study to produce the target count yarn based on the properties of the filaments. The study is to solve an existing problem in the production line of the "Rose Yarn" factory in Beni-Suef Aera, which faced a problem in producing that yarn cout due to the difficulty of operating the mixture proposed by the factory. **Search objective:** Studying the production of cotton yarns from blending of different cottons with the ring spinning system with better properties in functionality and economic cost, in addition to maximizing the added value of the product. **Research importance:** Determining the best blending ratios for the yarns produced by the ring spinning system, which in turn affects the functional performance of the yarns and fabrics. **Methodology:** The research depending on trying and analysis method. **Results:** The study depends on the description of the best blending ratio of the filaments, and conducting an analysis of the properties of the cotton yarns produced by the ring spinning system with counts of yarn 12Ne, 16Ne, and 20Ne according to the different quality of the cotton material that makes up the yarn (9 samples) and testing the general properties of the produced yarns and studying the results after analyzing them statistically to determine the best types of yarns that are Produced by ring spinning system. From the results of the tests that were carried out on the fabrics produced from the yarns under study, that the blending ratio (7 Benin cotton: 8 Greek cotton: 5 American cotton) achieved the best readings for air permeability, degree of absorption, and elongation, for all the products produced from the ratio of the proposed blending, as shown in Figure (5). Considering the stability of the cover factor for all fabrics produced.

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