

## **Comparison Study of core spun yarns properties of some cellulosic fibers**

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### **Abstract**

The core spun yarns industry has developed greatly recently, and the core spun yarns with a flexible core are characterized by flexibility and ease of care, in addition to providing greater physiological comfort in use. The core spun yarns depend on the variables applied during the manufacturing stage. The production of the core spun yarns includes the presence of interspaces between the surface filaments and some of them, and the interspaces between the core filaments and the surface filaments, and these interspaces are what help the process of absorbing sweat, water and liquids and act as a thermal insulator and improve the functional properties and physiological comfort of fabrics clothes produced from it.

4 yarns, 2core spun yarns were produced (continuous polyester core spun yarn with number 50 denier and the cover was cotton and production of core spun yarn number 24/1 Ne + core spun yarns with a continuous polyester core of flat number 50 denier and the cover was viscose and production of core spun yarns number 24 /1 Ne) and 2 spun threads (100% cotton spun 24/1 Ne + 100% viscose spun 24/1 Ne) meaning 4 yarn samples. 2 core spun yarns and 2 spun yarns.

Laboratory tests were conducted to evaluate the functional properties of the produced yarns, and the cross-section of the spun and core spun yarns produced from cotton and viscose was photographed by microscope, and statistical analysis of the results was carried out. The thickness is greater than the thickness of the thread by 50%, the knot is 280%, and the water absorbency for both core spun yarns of cotton and viscose materials and spun yarns of cotton and viscose materials and compared to them.

### **key words:**

Modified ring spinning –core spun yarns - spun yarns

## 1. Introduction

Recently, modern raw materials and modern technology have appeared in the textile industry, and technological threads have opened, including axial threads, and their development has become significantly to increase market demand for them to integrate the axial threads for the characteristics of the core fibers and cover fibers and the characteristics of the raw materials used

In addition to using high-performance fibers or traditional yarns and employing them with coaxial yarns, so that the fabrics made from them have attractive properties and modern technological functions (1).

Ring spinning is the most common method in the industry due to its ease and the quality of the resulting yarns.

In the ring spinning system, the quality of the axial yarns is determined by the structural properties if the core thread is fixed in the center of the thread and covered well with the cover threads, and this indicates the quality of the thread. The heart is properly covered to be completely covered with the cover in order to avoid the presence of places not covered by the cover fibers.(2)(3)

Much research has been done to improve the physical and mechanical properties of axial yarns and fabrics.(3)(4)(5)

The knitted fabric industry in the world has developed a great deal, especially in recent years, to the extent that it has become a competitor to woven fabrics. This type of construction has spread in the modern era rapidly in the fabrics of inner and outer clothing as a result of the many properties and advantages of these fabrics in addition to their diversity that satiated different tastes .(6)

### Research problem

Despite the technological progress in the field of yarn production, most local yarns are still produced using traditional methods without taking into account the achievement of the required functional and aesthetic properties, which makes them unsuitable for the nature of use and competition in foreign markets. Therefore, it was necessary to go to the possibility of producing axial yarns with raw materials Various and various on a modified ring spinning machine.

### research importance

The importance of the research enables the production of axial yarns with different cellulosic materials to improve their physical and functional properties and compare them to each other and to ordinary spun yarns, to reach the characteristics and characteristics of axial yarns, and to study their preference for use over ordinary spun yarns.

### Research Methodology

This research follows the experimental and analytical method.

### research aims

1. Improving the production of axial yarns with different materials that combine the properties of natural and synthetic fibers in one thread using the axial spinning method with a modified ring spinning machine.

2. Achieving the quality and functional performance characteristics of the axial yarns and comparing them with the ordinary spun yarns with the same materials and comparing them between them.
3. Develop the local product in the axial yarns that are technologically modern so that they have distinctive functional and aesthetic characteristics and are able to compete in foreign markets.

### **Research hypotheses**

- 1- Using different natural and synthetic materials to produce axial threads that have new functional and aesthetic properties.
- 2- The use of raw materials and Nimer for the different axial yarns affects the functional and aesthetic properties of the produced yarns.
- 3- The axial threads and their comparison with the similar spun threads in terms of number, material and twist factor.
- 4- The use of coaxial yarns of cellulose fibers in the cover and the effect of the polyester core on the functional and aesthetic properties of the produced yarns

### **Research Methodology**

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### **Conclusions**

- 1- Axial threads are less regular and less in thin places 50% and higher in knots number 280% and equal in water absorption capacity and less hairiness and higher in number of thick places 50% and higher cut resistance than spun threads.
- 2- The spun yarns are of higher elongation than the axial yarns.
- 3- Axial and spun threads are equal in tensile strength to cotton and viscose.
- 4- Axial threads have higher cutting resistance and higher water absorption than spun threads.
- 5- The cutting resistance of the axial threads is higher than the threads spun in viscose in the normal and wet condition.

### **Recommendations**

- It is recommended to use axial yarns to add distinctive natural and physical properties to the produced yarns as they increase elongation, cut resistance and durability due to the polyester core in addition to enjoying the softness of cotton and viscose in the cover and their ability to absorb water.
- Thus, the possibility of using these axial threads in the production of woven fabrics with special features and high quality without difficulties.

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