



UNI-FAB: A Review on Union Fabrics

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ABSTRACT

Union Fabric is a type of textile material that is known for its significance, strength, and versatility. It gained importance during the Industrial Revolution in the 18th and 19th centuries and continues to be utilised today for a variety of purposes. This study aims to review the work that has been done on union fabrics and to identify the scope of further research in this domain. This review has been done in order to find out about the various areas for research in this sector.

Keywords: Union fabrics, Sustainability, Cotton.

1. INTRODUCTION

1.1 What is Union Fabric?

Union Cloth is a type of textile fabric that holds historical significance and is known for its durability, strength, and versatility. It gained prominence during the Industrial Revolution in the 18th and 19th centuries and continues to be utilized today for a variety of purposes.

Union Cloth is a densely woven fabric made from a blend of cotton and linen fibers. The combination of these two materials results in a fabric that possesses the best characteristics of both fibers. Cotton provides softness, breathability, and moisture absorption, while linen contributes strength, durability, and a slightly coarse texture. The blend of these fibers creates a fabric that is resilient, long-lasting, and well-suited for various applications.

1.2 Difference Between Blended Fabrics and Union Fabrics

Blended Fabrics are made up of blended yarns. Blended yarns contain fibers of different composition in fixed proportions. Thus, a blended fabric may be made of polyester/cotton in 67:33 ratio in both warp and weft.

Union fabrics are the fabrics where in the fibre content of warp is different from that of weft. Thus, a Silk/Viscose union fabric may have silk in the warp and viscose in the weft.

2. LITERATURE REVIEW

As per the research 'A Study on Properties of Union Fabrics Developed with Sisal Fiber for Textile Application' Sisal fibre, cotton, cotton/viscous and polyester yarns were used to produce three different union fabrics. The first union fabric was made from sisal and cotton (F1), second was made from sisal and cotton/viscous (F2), and the third was made out of sisal and polyester (F3). There were various tests done on the produced fabrics, such as Thread Count, Thickness, Weight, Drapability, Crease Recovery, Tearing Strength, Abrasion Resistance, Bending Length, and Tensile Strength.

The study Functional Properties of Bamboo and Tencel Union Fabrics showed that introducing new fibres such as bamboo and tencel improves the quality and durability of the fabrics produced. There were different functional properties discussed of the union fabric like Stiffness, Crease Recovery, Tensile Strength and Elongation, Drapability, Thermal Insulation Value, Air Permeability and Abrasion Resistance.

FINDINGS

The following observations were found during the review:

- (i) Among the three union fabrics F2 was of maximum thread count i.e. 30.4×23.2 (705.28) and F3 was of minimum thread count i.e. 30.4×18.4(559.36).

- (ii) The thickness was minimum for F2 i.e. 0.82 mm and maximum for F1 i.e. 1.05 mm.
- (iii) The average weight and weight/unit area of the fabrics depicted F2 was noted with the minimum value, and it was maximum for F3.
- (iv) Drape coefficient was calculated minimum in F2 whereas it was maximum in F1.
- (v) Crease recovery was observed that F2 had maximum crease recovery in warp direction whereas in weft direction it was F3 which had maximum crease recovery.
- (vi) Tearing strength was generalized with the test that F3 had the maximum tearing strength as compared to F1 and F2.
- (vii) Abrasion resistance was observed that F3 had maximum strength to withstand against abrasion or rubbing. Whereas F1 had maximum abrasion.
- (viii) Bending length for the fabrics was seen that F2 had minimum stiffness in warp direction whereas it was similar in weft direction for all the three fabrics.
- (ix) The tensile strength of the fabrics was seen as F1 had maximum load/elongation values than F2 and F3 in both warp and weft direction. So, it can be concluded that F1 had more tensile strength than F2 and F3.
- (x) It was observed that Cotton yarn obtained maximum yarn twist (16.84) compared to Bamboo (3.84) and Tencel (9.24) yarns of 30s counts which is due to the fibre content.
- (xi) Bamboo (8.2%) and Tencel (8.4%) yarns of 30s count possessed greatest amount of unevenness percentage which may be due to the presence of water in varying amounts or an uneven blend of two or more fibres will alter the relative permittivity.
- (xii) Bamboo 20s (922 no of hairs/km) yarn possessed highest yarn hairiness and length of hairs ranging from 3mm to 15 mm which may be due to the yarn manufacturing, yarn production techniques.
- (xiii) The count strength product was also seen higher in Cotton yarn (2954) because yarn count and yarn twist contributes to strength of the yarn which ultimately enhances the count strength product.

CONCLUSION

In conclusion, a union fabric is a textile fabric, which is woven using two different yarns in warp and weft direction to get a new fabric having the properties of both the yarns. Union fabric enables the weavers to combine two different sets of yarns so that good qualities are emphasized, and poor qualities are minimized, thereby having the fabrics with better functional properties. Bamboo and Tencel union fabrics being user friendly, ecofriendly is of great use in medical textiles too.

The study would impart market value to sisal fibre by introducing them for fabric production for home furnishings, upholstery and make value added products, which would enhance the profitability of sisal farming.

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