

Performance and UPF Properties for Double Weave Fabrics Produced from Eco-Textile Materials

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Abstract:

The sun is the source of all activities necessary for the continuation of human life and all other creatures, and is the main source of energy on Earth, without the sun life becomes impossible. The sun is a double-edged sword. Despite the importance of the sun's role in human life and health, it has a negative effect, starting from causing damage to human skin to causing toxicity in some cases. Accordingly, the methods used to protect against the sun have multiplied as a result of increased awareness of the importance of protection from the sun's rays; whether through topical protection using sunscreen products such as creams with different degrees of protection, or by using nutritional supplements, foods and medicines, or by using fabrics to protect from the sun. The latter method is considered one of the oldest and most effective methods, especially for directly protecting the skin of the body, so many studies have focused on determining the levels of sun protection in relation to the properties of fabrics used for this purpose.

There has been an increasing demand recently for the use of natural fibers that combine the properties of physiological comfort and functional performance during use. The most famous of these fibers for achieving these properties and sometimes even outperforming the usual natural fibers are Tencel and Modal fibers. Given the physical and mechanical properties of this type of modern fiber, it makes it superior to its counterparts from traditional natural fibers. Therefore, the research turned to benefit from these materials and employ them in the production of fabrics that resist ultraviolet rays, where eight samples were produced using the woven method using two textile materials for the warp threads, which are tensile and micromodal, and polyester was used as warp threads. Also, the produced double fabrics depended on four textile structures, which are 1/3 file, 4 atlas, 2/2 file, and 2/2 extended tooth. Laboratory tests were conducted on the implemented samples and the results were compared to determine the best implemented samples in terms of fulfilling the performance properties and resistance to ultraviolet rays.

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