

The Effect of Yarn Count and Fabric Structure on the Quality of Fabrics Made from a Blend of Turkish and Greek Cotton

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Abstract:

Objective: This research aims to investigate the effect of yarn count (Ne) and fabric structure on the physical properties of fabrics made from a blend of Turkish and Greek cotton. It aims to establish the relationship between yarn count and thread density while maintaining a constant cover factor, facilitating accurate comparisons between different fabric structures.

Significance: Helps improve fabric quality by understanding the relationship between yarn count and fabric structure. Supports the textile industry by providing scientific data to optimize fabric design for different applications. Contributes to sustainability by improving fabric durability and performance. **Methodology:** Experimental approach. **Findings:** Increasing yarn count leads to a higher number of threads per centimeter due to the smaller yarn diameter. Plain weave is the densest and strongest but has lower softness and air permeability. Satin weave provides the highest softness but has the lowest tear resistance. Twill weave offers a balance between strength and flexibility. A graphical analysis demonstrated the effect of yarn count on thread density across different fabric structures, helping fabric designers optimize fabric properties for specific applications. Blending Turkish and Greek cotton enhances fabric performance compared to using a single cotton type. **Recommendations:** Use higher yarn counts (30-40 Ne) for fabrics requiring softness and flexibility (e.g., luxury garments). Use lower yarn counts (20 Ne) for fabrics demanding durability and strength (e.g., upholstery and workwear). Plain weave is best for applications requiring maximum durability and minimal air permeability. Twill weave provides a balance between durability and comfort, making it suitable for everyday clothing. Satin weave is ideal for luxury fabrics needing smoothness and shine but requires additional treatment to improve tear resistance. Future research should explore different Turkish-Greek cotton blending ratios and the impact of finishing processes on fabric performance. **Conclusion:** The study confirms that yarn count and fabric structure significantly influence fabric properties. The selection of an appropriate combination optimizes fabric softness, strength, and air permeability. The blend of Turkish and Greek cotton offers superior qualities, making it a valuable choice for textile manufacturers. The findings can guide fabric designers in achieving the ideal balance between durability, comfort, and aesthetic appeal.

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