

## Improving Performance and Functional Properties of Different Cotton Fabrics by Silicon Dioxide Nanoparticles

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### Abstract

The aim of this research is to enhance the functionality of cotton fabric by using Nano finishing technology through applying Silicon Dioxide NPs with different concentrations and different application treatment methods to get optimal result on 100% cotton fabrics (Woven fabric, Indian Cotton, and Egyptian Cotton Giza 86), the best result of treatments of SiO<sub>2</sub> were dyed with Direct dye. The effectiveness of the treatment assessed by using standard tests and influences of the finishing for some general textile properties as weight, thickness, tensile strength, elongation, air permeability, thermal gravimetric analysis, ultraviolet protection factor, anti-bacterial test, contact angle and color fastness properties as well as the durability of the treatments was investigated. The optimal performance reached through pad – dry – cure process for high concentration Silica Dioxide NPs treatment for woven cotton fabric give multifunction properties.

**Keywords:** Silicon Dioxide, Anti-bacterial, Ultraviolet protection, Cotton fabrics, multifunction properties