

Effect of Providing Semi-Mechanical Carpets with Self-Cleaning Property on Some Physical and Mechanical Properties

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Abstract:

In Nanotechnology there are two types of self-cleaning surfaces: The first type has a rough microscopic surface that makes dirt particles difficult to adhere it, so thus, pass away easily when washed with water, and the second type depends on the presence of Photoactive layers such as Nano titanium dioxide, which converts air oxygen into active oxygen in the presence of sunlight, as it breaks down organic materials, dirt and stains. Based on the above, it is expected that once the carpet has been treated to give it self-cleaning properties, there will be a change in some physical and mechanical properties of the carpet. **This research aims** to study the resulting changes in some physical and mechanical properties of carpets produced in a semi-mechanical method after giving it a self-cleaning property and to achieve this goal several samples 27 were produced using the hand-tufted method using different materials, densities pile /cm, and height of the pile. **The research methodology** depends on the experimental and analytical approach and the link between both, and the study yielded some **results**, the most important of which are: The best samples that achieved the highest self-cleaning ratio were mixed samples, then polyester samples, and finally wool samples. There is a direct relationship between the density of the pile (the number of stitches of the pile /cm) and the amount of the height of the pile (mm) and the percentage of loss in the thickness under the influence of a static load of the samples produced under research (when the textile specifications used are stable). Increasing the percentage of the loss in the thickness under the influence of a static load for carpet samples produced under research after the treatment than before the treatment. There is a direct relationship between the pile density (the number of stitches of the pile /cm) the amount of the pile height (mm) and the percentage of the carpet's resistance to abrasion by friction for the carpet samples produced under research (when the textile specifications used are stable). Increasing the percentage of the friction resistance of the carpet samples produced under research after the treatment than before the treatment.

Keywords:

Semi-Mechanical Carpet — Nanotechnology — Self Cleaning — Nanotitanium Dioxide.

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