

Role of nanotechnology to improve products properties and increase its life time

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Abstract:

Nanotechnology has become one of the most important technologies that are used recently in all fields, especially the field of product design and manufacture, where this technology applies to the application of nanoscience for the purpose of creating and producing means, techniques, inventions and useful products that are characterized by their infinitesimal size in addition to improving the appearance, characteristics and quality of the industrial product and thus increase its life time by controlling or manipulating the material on the atomic scale where the material is processed on the smallest scale, which ranges from 1 to 100 nanometers² and thus the ratio of surface area to volume is much higher and as the surface atoms are the most reactive so the properties of the material change in unexpected ways. The physical, chemical and mechanical properties of these small particles change, or a new feature is added or a new material is produced, which improves the properties and functions of the products and thus increases the life time, and nanomaterials have multiple shapes depending on the purpose of their use, each of which has lengths, diameters, composition and distinct characteristics. Therefore, the research aims to focus on the importance of nanotechnology in improving the properties of the product and thus increasing its life time, and conclude how designers will benefit from nanotechnology in the field of future products design and manufacture. To achieve this goal the research follows the descriptive analytical deductive approach by studying the concept of nanotechnology, different nanotechnology materials, their classifications, shapes, different properties, nanocoating and applications of nanotechnology in the fields of product design and manufacture, its impact on improving the properties of these products in addition to future applications in the field of products design and manufacture using nanotechnology, in order to emphasize the importance of this technology in increasing the product life time, and conclude how designers will benefit from nanotechnology in the field of future products design and manufacture. One of the most important recommendations of the research is the interest of designers and technologists in all the research presented in the field of nanotechnology and the identification of all new materials and new characteristics that contribute to the improvement and development of industrial products, the need for cooperation between designers and researchers in the field of nanotechnology to facilitate the process of benefiting from nanotechnology in raising the value of the product and extending its life time.

Keywords:

Nanotechnology, Nanomaterials, Nanocoating, Applications of nanotechnology in the fields of product design and manufacturing.