

**USE OF MODERN TECHNOLOGIES IN THE MANUFACTURE OF
TEXTILE MATERIALS WITH SPECIFIED PROPERTIES**

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The priority direction of the development of textile materials is the introduction of nanotechnologies. Nanotechnology is a set of methods and techniques that provide the possibility of controlled creation and modification of objects containing components with dimensions less than 100 nanometers, which have fundamentally new qualities and allow their integration into fully functional systems on a larger

scale. Nanomaterials are materials that contain structural elements, the geometric dimensions of which do not exceed 100 nanometers in at least one direction.

In the near future clothes made from them will be automatically heated, cooled, maintain a certain temperature of the human body under extreme conditions, relieve fatigue or allergies, repel electric charges, dirt.

Underwear with a moisture-absorbing effect; suits, dresses that repel liquid; some things even will be able to treat wounds and infectious diseases, control the most important vital functions of the human body; find a way in unfamiliar places; observe children's behavior; turn coats or jackets into mini computers. In the textile industry of developed countries, the production of nanofibers and the final processing of fabrics at the nanolevel are widely implemented. Chemical fibers acquire high electrical and thermal conductive properties, chemical activity, resistance to UV radiation, increased strength and endurance to bending. The assortment of textile products with protective functions includes knitted underwear, sports products, overalls, military clothing and medical textiles.

Nowadays, Ukraine has studied and summarized the foreign experience of using modern nanotechnologies in the production of textile materials and products for various purposes. Clothing with silver nanoparticles has antiseptic activity, it can be used as a bactericidal and antimicrobial means of protection. (Anisimov, 2011, p. 464). Nanoparticles of carbon, copper, polypyrrole, and polyaniline provide electrically conductive properties to fabrics. Clothing made of textiles with nanoparticles of zinc oxide, titanium dioxide, tin with antimony admixture has excellent antistatic properties. Smart clothing made of palladium can neutralize the harmful components of smog. Smart wear with carbon nanoparticles (in the composition of embedded nanotubes in the fibers of the original material) has the ability to protect the wearer from electromagnetic radiation (Halyk, 2013, p. 109).

Clothes made of fabric in which polymer protein nanofibers are used according to the principle of “spider web” are resistant to external factors. Examples of uses are body armor, military uniforms or suits for extreme activities. Carbon nanotubes, montmorillonite (nanoclay) provide fabrics with fire resistance and controlled release

of active substances, medicines or aromas.

Fabrics with microcapsules are capable of absorbing the heat released by the human body during hard work, or releasing it when the body's heat output decreases or the temperature drops.

Cosmetotextile is fabric with microcapsules of active ingredients, which later gradually come out and have a cosmetic and health-improving effect. Textile elements (an analogy to cosmetotextiles) have gained wide application in the medical field (High-tech materials, 2022).

Mostly, most types of medical textiles of domestic production (bedding and underwear for patients, surgical clothes, products for medical personnel, and others) are made of textile materials from natural plant fibers (cotton, flax), which are characterized by high hygroscopicity, vapor and air permeability, bactericidal properties, low ability to pollute.

Nowadays all the developed countries of the world position nanotextile as a priority area of development of science and technology and implement them in state development programs.

References:

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