OPTIMIZATION OF THE STRUCTURE, TECHNOLOGICAL PARAMETERS, AND PHYSICAL AND MECHANICAL PROPERTIES OF TWO-LAYER AND MIXED KNITTED MATERIALS FOR TOP KNITTED PRODUCTS.

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Today, the growing demand for outer knitted products requires knitted fabrics to have not only aesthetic, but also high operational and functional properties. In particular, two-layer and blended knitted fabrics have advantages over traditional single-layer knitted fabrics in terms of heat retention, shape stability, elasticity, and hygienic indicators.

The design structure, technological parameters, and physical and mechanical properties of double-layer and blended knitted fabrics intended for imported outerwear products have been scientifically studied. In laboratory conditions, such parameters as weave types, interlayer connection schemes, yarn composition, surface and volumetric density, air permeability, breaking load, deformation indicators , and other similar parameters of the selected five types of knitwear were determined, and their influence on operational characteristics was assessed. As a result of the analysis, it was established that the high quality indicators of knitted fabrics imported to our country bo'are ensured mainly due to a rational structure and strong interlayer binding elements. Based on this, scientific and practical recommendations have been developed for the development of combined and double-layer knitted structures with reduced raw material consumption and high shape retention.

Knitted fabrics in the composition of imported products are often made on the basis of complex structural solutions, interlayer binding elements, and mixed raw materials. However, the high quality indicators of such fabrics are often associated with high material consumption and cost, and their full reproduction under local

production conditions is economically inefficient. Therefore, the main goal of this research is the scientific analysis of the structure of imported knitted fabrics, the identification of their effective structural elements, and the development of rational knitted structures with reduced raw material consumption, but with preserved or improved operational properties.

Two-layer and blended knitted fabrics for outer knitwear occupy a special place in the modern clothing industry due to their high operational, aesthetic, and hygienic properties. In double-layered knitwear: shape stability, heat retention capacity, deformation resistance largely depend on the solution of interlayer binding threads.

Five types of knitted fabric intended for outerwear imported from abroad were selected as the object of analysis. The following criteria were taken into account in the selection: widespread in the market', having high performance indicators', differentiation of the design structure, presence of interlayer bonding elements'and several other characteristics.

As a result of the experiments, it was established that there is a clear correlation between the structure of knitted fabrics and their physical and mechanical properties. In particular: Variant V knitted fabric has the lowest surface density, which ensured its lightness and high air permeability. Variant III has the lowest volumetric density and is considered the most effective sample in terms of material capacity. Variants III, IV, and V showed high results in deformation stability and shape-preserving properties due to a rational interlayer bonding scheme. It has been established that with an increase in the number and location of interlayer binding threads, the strength increases, but this leads to an increase in material consumption. Therefore, the concept of achieving maximum structural stability through minimal binding elements was proposed as the optimal solution.

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