

ТЕХНОЛОГИЯ ТЕКСТИЛЬНОЙ И ЛЕГКОЙ ПРОМЫШЛЕННОСТИ

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RESEARCH OF THE EXISTING THEORY AND PRACTICE OF CALCULATION AND PURPOSE OF ALLOWANCES WHEN DESIGNING GARMENTS TAKING INTO ACCOUNT DEFORMATIONS OF TEXTILE MATERIALS

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ИССЛЕДОВАНИЕ СУЩЕСТВУЮЩЕЙ ТЕОРИИ И ПРАКТИКИ РАСЧЕТА И НАЗНАЧЕНИЯ ПРИПУСКОВ ПРИ КОНСТРУИРОВАНИИ ШВЕЙНЫХ ИЗДЕЛИЙ С УЧЕТОМ ДЕФОРМАЦИЙ ТЕКСТИЛЬНЫХ МАТЕРИАЛОВ

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The deformations which are shown when performing various technological operations, the bound to constructioning, manufacture, conditions socks of garments have in definition of allowances to them the major role. In view of complexity of the mathematical description of processing of deformations of textiles the theoretical analysis of their intense strained state even at flat or rotationally symmetric forming meets the considerable difficulties [1]. It is known that the clothes are created taking into account a form and the sizes of a figure of the person, but are not its precise copy. Clothes adhering degree on different sites of a figure is not identical. On sites of bearing areas, between clothes and a body of the person, there are air gaps which are necessary for ensuring freedom of respiration and movements, normal activity of the person.

When constructioning clothes the dimensional signs received by measurement of a concrete figure of the person or taken from tables of anthropometric measurements of standard figures are only a part of measurement of the respective site of clothes. Each measurement of garment on any design line lying on its surface, to equally similar measurement of a surface of a body of the person plus an allowance for the free fitting and decorative and design registration. Therefore at creation of drawings to the received measurements count express allowances: on the free fitting, a silhouette and a form, on thickness of materials and the warming laying; they are given to product width on lines of a breast, waist and hips, to the armhole depth, length and width of a back and shelf, sleeve width, length of a product and sleeve [3,4].

Allowances for the free fitting include technical and decorative and design allowances. The technical allowance is, minimum necessary allowance for creation of a normal microclimate around a body of the person (respiration, moving, regulation of heat exchange, skin respiration), i.e. a comfortable state. In it is considered also the allowance for fabric thickness. On the warming laying the padding allowance depending on its thickness is given. The technical allowance is given only to cross sectional dimensions of a product, but it can sometimes increase also to lengths. The size of a technical allowance is established by anthropologists and hygienists, it depends on a type of a product [1,3].

The technical allowance to a grasp of a breast has a stationary value, it is minimum necessary and stationary value on the free fitting of a product and does not depend on model and changes in fashion. Depending on a type of a product the technical allowance in the area of a breast is calculated proceeding from a look and properties, the applied original material. Irrespective of product adhering

degree when constructioning it needs to be provided freedom of respiration and movements, minimum pressure upon a body and also existence of an air gap for regulation of heat exchange in under a clothes layer and skin respiration.

The difference in a thorax's grasps measured at a deep breath and the complete exhalation in medicine is called "a thorax excursion". It is not identical at different people and depends on an age, physical development of the person, his fitness and other factors: at athletes it is routine more, than at the persons who are not playing sports. According to the known data, the excursion of a thorax is on average equal: the persons who are not playing sports - 5,5 cm, at athletes have 6,5 - 8,0 cm (on the complete grasp of a breast) [1,3].

For a product from fine fabrics an allowance is minimal, from thick — maximal. If the product is sewed from overcoating, then the technical allowance is reconsidered towards its increasing, proceeding from a look and thickness of fabric. In practice of clothes's constructioning technical allowances on waistlines and hips do not count.

The size of a decorative and design allowance depends on fashion, a silhouette and a product's type. Such allowances can be given as on width, and longwise, can be zero.

To simplify calculations in the process of designing clothes, use the total allowance for free fit (Bust tolerance), which includes both technical (Bust tolerance technical) and decorative-constructive allowances. The formula for calculating the total allowance bust tolerance is written in the following form:

$$\text{Bust tolerance} = \text{Bust tolerance technical} + \text{Bust tolerance decorative}$$

Meanwhile, the dependence of the allowance for free fit on the properties of tissues, in particular, on the deformation, has been little studied [1, 3]. Naturally, regardless of why, the allowances can not be less than the existing deformations (D) in textile materials and fabrics. I.e. It is necessary that the final allowance be met.

$$\text{Bust tolerance final} \geq \text{Bust tolerance} + \text{deformation.}$$

For the majority of processes definition of deformations and tension perhaps only at introduction of the simplifying hypotheses of process's course [2]. A basis for creation of theoretical computational methods of processes of plastic forming and also criterion of a regularity and accuracy of analytical decisions are generally test details. Moreover, development of the new and perfecting existing methods of the experimental physics and mechanics for the purpose of obtaining the reliable and precise quantitative data about an intense strained state, allows to consider the experimental studying of processing of textiles as the self-contained approach standing flush with theoretical. In certain cases the experimental research technique of deformation's processes is unique and reliable. At the same time in some cases use of the experimental methods can be inexpedient as there are rather reliable analytical decisions. Therefore now the question about creation of experimental and analytical methods is particularly acute enough [4].

In this work an attempt to realize this idea. Apparently, the main approach here is using of imitating mathematical models. Describing deformation processes because, as we know, such models assume use of the experimental datas. In them a starting point are or the found analytical relations and supported with the experimental datas, or the last by which analytical expressions of model are determined by mathematical methods.

By the authors considered the innovative methods of the theoretical and experimental analysis of deformations in textiles and clothes based on use of imitating mathematical models, touch and digital technologies. Owing to the restricted volume of this publication of the data by results of these researches it is not possible to show.

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