NOVATEUR PUBLICATIONS
JournalNX- A Multidisciplinary Peer Reviewed Journal
ISSN No: 2581 - 4230
VOLUME 9, ISSUE, Mar. -2023

DEVELOPMENT OF A SET OF REQUIREMENTS FOR THE DESIGN OF COMFORTABLE CLOTHING FOR YOUNG CHILDREN

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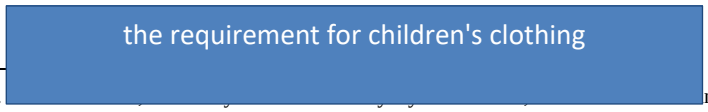
Annotation
For moral satisfaction, clothing should correspond to aesthetic preferences, which will vary depending on the age group of children, which is associated with psychological crises. It should be noted that the concept of "comfort" is complex and reflects the state of comfort of the body from a subjective point of view, which is based on a sense of satisfaction when using clothes.

Keywords: Comfort, clothing, design, engineering, industrial product, age groups, clothing functions, climatic features.

In the modern world, the concept of "comfort" of clothing is inextricably linked with the safety of the product, since ensuring optimal indicators of properties that characterize the comfortable state of the body reflects its normal functioning. It should be noted that the design developments took into account those ergonomic requirements that are set out in the normative and technical documentation, but now the question is being raised about the design and creation of such industrial products and subject environment, with the use of which human activity becomes optimal, i.e. while ensuring high efficiency of activity, no harm will be caused to the physical health of a person.

This concept is closely related to the term “comfort”, which consists of psychological and physiological aspects. For moral satisfaction, clothing should correspond to aesthetic preferences, which will vary depending on the age group of children, which is associated with psychological crises. It should be noted that the concept of “comfort” is complex and reflects the state of comfort of the body from a subjective point of view, which is based on a sense of satisfaction when using clothes. Psychoemotional and physical comfort are closely connected and form a single whole. This is of particular importance for children. Physical discomfort can affect both the still unformed psyche and development, as well as the health of the child.

Clothing performs a number of functions, one of the most important is the maintenance of a comfortable microclimate of the underground space, which affects the development of the child's body. In this regard, there are many requirements for children's clothing: for compliance with safety, consumer and production. The paper proposes an expanded classification of requirements for children's clothing[1], presented in pic-1. When developing requirements for children's clothing, the manufacturer must take into account many factors[2].



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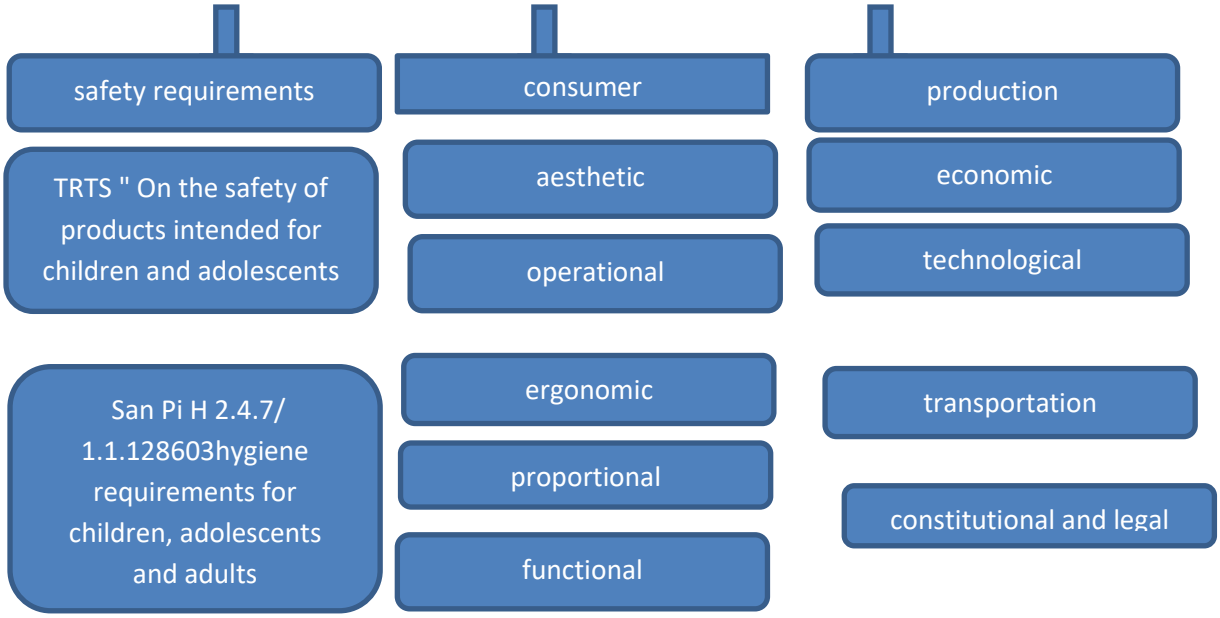
[2] Moskalenko N.G. Designing clothes for extreme sports with increased ergonomic performance. Dis. Candidate of Technical Sciences. Vladivostok. 2011. - 188 p.



Pic-1 - Requirements for children's clothing.

Convenience in the operation of the product plays a significant role. Clothing should not restrict movement and cause negative feelings. Social requirements reflect the demand of buyers for children's clothing of a reasonable range that meets the basics of public education of children and maintains competitiveness in domestic and foreign markets[3].

Functional requirements mean the conformity of clothing to a specific purpose. The purpose of clothing can be of a household and special nature. For children of younger preschool age, simple and convenient fasteners should be provided in easily accessible places, so the child develops independence. The aesthetic requirements should be approached from two sides: the parent, as a responsible person, and the child. As for children, it is first of all necessary to distinguish between age groups. Due to the peculiarities of psychological and physical development in children of different age groups, aesthetic preferences will differ[4].

For preschoolers, the determining factor is color, at school age the first idols appear as various characters and heroes. Drawings on clothes with various cartoon characters are quite popular, because children want to have clothes with their favorite character in their wardrobe. Teenagers mostly focus on fashion trends[5].

The aesthetic assessment of an adult of real products is revealed when comparing them with the ideal, i.e. a person's idea of the beautiful. The concept of "beautiful" develops in a person's mind under the influence of a number of factors: the standard of living of society, working conditions, the level of

[3] Beskorovaynaya G.P. Kurenova S.V.; Edited by G.P. Beskorovaynaya. – 2nd ed., ster. – M.: Publishing center "Academy": Mastery, 2002. – 96 p. Designing children's clothing.
[4] Demskaya A.A., Kirsanova E.A., Vershinina A.V., Chalenko E.A. Influence of material properties and processing methods on the formation of aesthetic perception of sewing products. // Design and Technology № 53 (95). – 2016. – Pp. 51-56.
[5] Ovchinnikova I.P., Rusetskaya A.I. Research and development of new designs of children's clothing. // Vitebsk. – 2017. – pp. 159-161.

culture and production, climatic, national characteristics, etc. The aesthetic properties of clothing are directly affected by its geometric shape and the properties of the materials used[6].

Ergonomic requirements can be expressed in one capacious and at the same time subjective word "comfort". From the consumer's point of view, comfort consists of tactile sensations and psychological satisfaction with the appearance of the product, as well as well-being during operation. This is provided by a complex of various factors, for example, such as safety, hygroscopicity, etc. Design solutions of children's clothing are especially important, because during operation it should not constrain the movements of the child, squeeze, rub, be heavy, etc.[7].

Determining the external parameters and finding the relationships between them, in which maintaining homeostasis would require minimal effort, is an important task, the solution of which will lead to the preservation of the health of the child's body and ensure a comfortable state of the indoor microclimate. In order to understand how to solve this problem, it is necessary to understand at least in general terms the physiological mechanisms of maintaining homeostasis[8].

A modern person in his daily life dresses his children according to his habits and information about meteorological conditions. At the same time, it relies on subjective thermal sensations. The regulation of the body's heat exchange with the environment is associated with a change in human behavior, i.e. a more or less involuntary change in posture, and also includes the choice of clothing in which the area of free heat exchange with the environment is determined: the length of the product, sleeve length, neckline, type of fastener, freedom of fitting, etc[9].

Afferent stimuli for this kind of behavioral reactions are subjective feelings of heat and cold. Heat sensations are a subjective assessment of a person's thermal state. In an effort to protect their child from the cold, the parent tries to increase the required number of layers of clothing, which is not always required, but on the contrary can harm health. The ability to assess the comfort of the microclimate of the storage space of the packages of materials is a tool with which it is possible to solve the preservation of the health of the child's body. Maintaining body temperature at a constant level occurs due to internal thermoregulatory processes, the strengthening of these processes due to changes in external conditions leads to an increase in the intensity of the body's work. The physiology of a teenager is closer to the physiology of an adult than a child[10].

In childhood, metabolic heat is of primary importance for the development of the body. The spatial distribution of temperature changes with changes in the proportions of the body at different stages of maturation of the organism. Proportions are the ratio of different parts to each other. Body proportions vary significantly depending on age (pig-2).

The changes mainly occur due to a decrease in the relative size of the head and trunk and an increase in the relative length of the limbs. Changes in the proportions of individual parts of the body of children in the process of growth occur unevenly. Therefore, clothing for children in size cannot be

[6] Demskaya A.A., Kirsanova E.A., Vershinina A.V., Chalenko E.A. Influence of material properties and processing methods on the formation of aesthetic perception of sewing products. // Design and Technology № 53 (95). – 2016. – Pp. 51-56.
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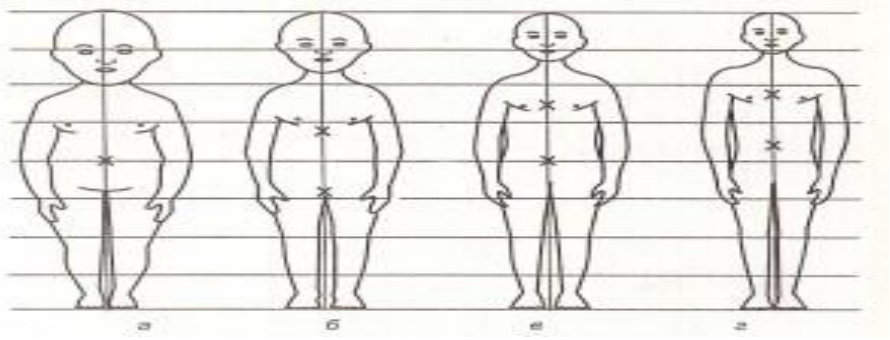
either a reduced copy of clothing for adults, nor the same proportions with clothing for children of different ages[11].



Pic – 2. Children`s proportions and physique according to Stratz data:
a – newborn; b – two- year-old; c- six years old; d– twelve years old

In addition to differences in body proportions and body types, there is a difference among age groups in body thermoregulation. Data on the skin temperature of various parts of the body are presented in the table -1[12].

Table -1 - Skin temperature of various parts of the body

Body surface area	Temperature, 0C
Axillary depression	Up to 37
Upper arm	36
Shoulder	32
Forearm	32
Brush	28
Hip	34
Shin	31
Foot	27-28

The thermal balance in the body is maintained due to the high heat capacity of the blood. In a child, the thermal conductivity can vary 4-7 times depending on the thickness of the muscle and subcutaneous fat layer in the corresponding part of the body, due to the high blood flow rate. The greatest fluctuations in thermal conductivity are observed in the extremities, where blood flow is carried out according to the principle of counterflow[13].

Thus, the child's cardiovascular system is an important component of thermoregulation, and overstrain of the thermoregulatory apparatus as a whole leads to significant loads on the cardiovascular system[14].

The thermal state of the body can be assessed by the following indicators:

- skin condition (paleness, redness);
- condition of superficial veins on the forehead and extremities;
- body temperature, skin temperature;
- temperature difference of the skin of the trunk and limbs;

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• the amount of sweating, as well as general physiological indicators:
• respiratory functions (pulmonary ventilation, respiratory rate);
• hemodynamic parameters (minute volume of blood flow, heart rate, pulse pressure, blood pressure, etc.);
• water-salt exchange. Mental and physical performance largely depends on how a person assesses their thermal condition[15].

The closest correlation of heat sensations with objective indicators of a person's thermal state is observed when he is in relative rest, as well as when performing light physical work. To a lesser extent, this relationship is expressed when a person performs both heavy and also works with pronounced nervous and emotional stress, which must be taken into account when assessing the microclimate. The water contained in the body evaporates at any air temperature. The evaporation process requires energy expenditure. The body gives energy to the evaporating particles and thanks to this it cools down. This process always proceeds exactly the same.

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