

to be changed and are worn to emphasize the membership of a particular social group.

Over time, as a symbol of various youth movements, street style turned into a separate fashion direction. Haute couture is often being influenced by street fashion and follows its trends. Making a collection is a long and complicated process that requires accuracy in the formation of the concept even in the early stages of development. A fashion designer should design the clothes that society definitely needs with the purpose of their successful sales.

Previously, street fashion styles were formed as an echo of high fashion shows. Street fashion today quite often goes a way back: from the streets to the runways as new clothing models. The most authoritative fashion designers closely follow the youth trends. Street styles of different epochs inspire fashion designers as well as the archival collection of the world's legendary couturiers.

Today street fashion is a challenge to high fashion. It opposes to any fashion trends, and allows you to wear something that you really like. At the same time, the modern fashion industry is democratic more than ever. The borders between street style and collections of the famous fashion brands that are shown on the catwalk are blurred. And famous designers often draw inspiration for their new collections exactly in the colorful street fashion.

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THE STRUCTURE AND PROPERTIES OF ECO-LEATHER

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Key words: artificial leather, eco-leather, footwear, physical–mechanical properties, quality.

Abstract. Nowadays, artificial leather is often used in footwear manufacture. It allows you to lower the cost of the product, get beautiful appearance. Artificial leather does not have sufficient physical and mechanical properties. The article presents the results of the study of physical and mechanical properties of the artificial leather in comparison with natural leather.

In recent years, the demand for footwear with artificial leather has been growing fast due to the rapid growth of the consumer demand. Artificial leathers are becoming

popular as an alternative material owing to limited availability of natural leathers. This material is multilayered and composite. Artificial leathers are generally produced by coating PU over a base fabric, which generally comprises woven or knitted fabric made of synthetic fibers and forming open cells to maintain air permeability. PU is a polymer compound that has a urethane bond (-NHCOO-) and a chemical structure in which soft segment, which is formed by the reaction of diisocyanate and polymeric polyol, and hard segment, which is formed by the reaction of diisocyanate and chain extender, exist simultaneously in a molecule. Due to this molecular structure PU has both tenacity and elasticity, which is a very unique property [1].

The subject of the research in this paper has been Eco-leather and natural leather (Nappa 2, Nappa 3, Russian leather) for the footwear. Eco-leather is used at JSC “Krasny Oktyabr” in the shoe model №839003. This material has four layers: finishing layer, nanopur layer, woven fabric and leather layer. Microscopic image of Eco-leather is presented at the figure.

This article reads about the research of the basic physical-mechanical properties: breaking load, tensile strength, breaking elongation, coefficient of non-uniformity in elongation, stress elongation 10MPa.

Physical–mechanical properties were tested according to GOST 17316-71 “Artificial soft leather. Measuring method of tearing load and elongation break” and GOST 938.11-69 “Leather. Tensile strength test” on a tensile machine IP 5158-5 [2, 3]. All tests were carried out according to standard test methods in conditioned atmosphere of $(20 \pm 2) ^\circ\text{C}$ and $(65 \pm 2) \% \text{RH}$.



1- finishing layer, 2 – nanopur layer, 3 – woven fabric, 4 – leather layer
Figure – Microscopic image of Eco-leather

The table displays the physical–mechanical properties of tested artificial and natural leather.

Table – Physical–mechanical properties of Eco-leather and natural leather

Physical–mechanical properties	Eco-leather (China)	Nappa 2 (Britain)	Nappa 3 (Britain)	Russian leather (Russia)
Thickness, mm	1,78	1,08	1,38	1,45
Surface density, g/m ²	784	328	453	524
Breaking load, N	258	221	381	442
Tensile strength, MPa	7	13	15	16
Breaking elongation, %	33	48	65	62
The coefficient of non-uniformity in elongation, %	74	88	74	77
Stress elongation 10 MPa, %	24	34	36	33

The table shows that Eco-leather has higher thickness and surface density than natural leather. The breaking load is the greatest effort to withstand the material destruction and expresses its ability to take the load. Eco-leather has higher breaking load than the Nappa 2, but lower than the value of Nappa 3, Russian leather. Tensile strength is the ability of a material to withstand a longitudinal pulling force. The table indicates that Eco-leather has lower tensile strength than natural leather. The elongation at break and elongation at stress 10MPa characterize the elasticity of the material. As shown in table Eco-leather has the lowest elongation at break and elongation at a stress 10MPa than Nappa 2, Nappa 3, Russian leather. The coefficient of non-uniformity in elongation characterizes the anisotropy of the material. Eco-leather has fine anisotropic properties as natural leather. As a result of the analysis we can conclude that Eco-leather does not have sufficient physical and mechanical properties. The use of eco-leather in footwear manufacture does not allow to create high-quality footwear.

References

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