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OPTIMAL OPTIONS FOR DYEING ASTRAKHAN SKINS

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ANNOTATION

The article describes the improvement of the marketable appearance of karakul skins, the improvement of processing technology of karakul to improve the durability of the finished product to various physical and chemical effects, opinions on the best options for applying and coloring dyes are expressed.

KEYWORDS: *karakul hide, fur dyeing, lightfast, dyeing solution, welding temperature, composition of dyeing solution, components, optimal options,hair cover, oxidizing dyes,chromium oxide.*

Uzbekistan's fur industry is one of the leading industries in the production of quality karakul leather.

Our country is famous for karakul skins, especially Bukhara karakul. Processed skins are exported to developed countries.

Biological variability of the hair and skin of caracal fur skins depends on their habitat conditions, on the geographical distribution and climatic conditions, on the age and sex of the animal, on the manifestations of individual variability of animals, and so on [1].

Purebred Karakul is defined by GOST 9296-74 and sorted according to the following characteristics: the hair cover of different degrees of silkiness and shine, consisting of astrakhan curls of different shapes, covering the entire wool area; the neck is covered with astrakhan curls with hair length in a straightened state not exceeding 30 mm; the hair cover of the head and legs has moire pattern or curls. Oxidizing dyes are also used to dye furs. Although these dyes are not dyes themselves, they oxidize during the dyeing process to form true dyes [2].

The development of the chemical industry has created great opportunities for the production of new preservatives, antiseptics and other chemical reagents, and the development of equipment has created great opportunities for the mechanization of raw materials and more technological processes of leather and fur production[3].

Dyeing Karakul skins with oxidizing dyes was applied in two ways: by dipping and dipping. In practice, the dipping method is used. For scientific research, samples of black Karakul skins, 4×10 cm for asymmetrical fringe method were made.

When dyeing the samples of karakul skins with oxidative dyes, each dye was pre-dissolved in water (ratio 1:10) at 80-90°C. The prepared solution is sieved and one by one poured into special containers. Perhydrol is diluted with water 1:5 and added 30 minutes after sampling. This helps to even out the color. Liquid ratio (s.c.-11), temperature 35-38^{0}C, the process is completed in 1 hour. Methods of rubbing, stenciling and reserving methods of karakul skins are not dyed, because these methods do not provide economic benefits for karakul skins.

Black aniline stains fur, but since aniline itself is a volatile toxin, it is very dangerous to work with, so this method is not used for dyeing astrakhan skins.

Although aniline dyeing is also characteristic of oxidizing dyes, it has a number of important features. Aniline dyeing is mainly used to produce a deep black color. However, due to the fact that this color is not lightfast and the dye deteriorates the fur tan fabric, this method can only be carried out by smearing. The finished dye was smeared on the fur coating, laid, dried and shaken; the second time the fur semi-finished product was smeared, laid, dried and shaken again.

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Table№1
Component dye solution composition, g/l

Component	Dye solution composition, g/l	
	First anointing mixture	Second and third anointing mixture
Aniline salt	60	30
Copper sulfate	15	15
Bertoolethal salt	25	10
Ammonium chloride	7,5	–
Wetting agent	1	–

Two different dye solutions have been developed. The first consists of aniline salt and wetting agent, the other consists of copper sulfate, bartole salt and ammonium chloride. Dyeing is carried out at a temperature of 25^0C. Both solutions were mixed and applied to the wool cover at 2/3 height.

After application of the solution, the woolen skin along the backbone was laid face inward and placed on racks. Process duration was 6-8 hours, temperature 25-30^0C was laid in three zones.

Process parameters:

- zone 1 temperature 40^0C, relative humidity 40%;
- zone 2 temperature 45^0C, relative humidity 70-80%;
- zone 3 temperature 45^0C, relative humidity 70-80%;
- zone 4 temperature 45^0C, relative humidity 40%; relative humidity 40%, total drying time 3.5 hours.

The aniline dyeing process is time-consuming, space-intensive and labor-intensive. Therefore, this method is not widely used.

Furs dyed with nylon dyes are more resistant to light and have a softer skin. This method did not produce the expected results with respect to samples of caracal skins. This is due to the fact that during dyeing with nylon dyes, the temperature of welding of tanning tissue is at least 70^0C and the concentration of chromium oxide (Cr2O3) requires 2 g/l. It is known that the concentration of (Cr2O3) for Karakul skins is 0.9 g/l, and the welding temperature of the leather fabric is 63-65^0 C.

Due to the fact that the dyeing temperature of nitrogen dyes is 42-50^0 C, a lower temperature (42^0C) is adopted for dyeing Karakul skins.

This is due to the fact that the use of high temperatures in the dyeing process deteriorates the properties of elasticity and plasticity. In addition, the difference between the temperature of the dye solution and the welding temperature of the tanning fabric should be within the range of 18-20^0 C. The alkaline environment is also low, which leads to uneven dyeing.

Although nile dyes impart lightfast, darker and deeper coloring to the fur semi-finished product than oxidizing dyes, this method did not give positive results when dyeing samples of karakul skins.[4]

Table №2
Parameters of dyeing of astrakhan skins with different dyes

Character of leather coloring	Parameters of the paint solution			
	Fluid coefficient	Temperature, ^{0}C	Process duration, hour	environment ph
Dyeing with etched dyes	10	55	2	subacid
Dyeing with oxidative dyes	11	35-38	3	slightly alkaline
Dyeing with nile dyes	12	42-50	2	strongly alkaline
Dyeing with oxidative dyes	12	55	2	Neutral

Dyeing with acidic azo dyestuffs is widely used in the textile industry as well as for dyeing fur.

Dyeing of karakul hides with oxidative dyes has a dark black color, but most of it remains in wastewater, i.e. about 50%, polluting it.

We know that oxidative dyes contain phenolic products, so their presence in wastewater can lead to many environmental problems. Nowadays, the environmental problem is one of the most pressing, so it is important to use dyes that are comfortable in all respects and do not pollute the environment. In scientific research, it is advisable to use acid dyes instead of oxidative dyes [5]. This is because the process of dyeing fur with 5 different shades of acid dyes currently being produced allows them to be absorbed from the fluid into the dermis and wool. These cases have been investigated and revealed in experimental tests. Several variations of dyeing caraculan skins with acid dyes were used in the experimental trials. This is because the process of dyeing mex with 5

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different shades of acid dyes that are currently being produced allows them to be absorbed from the liquid into the dermis and wool fabric. These cases have been investigated and revealed in experimental tests. Several variants of dyeing the karakul skins with acid dyes are used in the experimental tests.

According to the results of the applied dyeing, the optimal variants were chosen.

The composition of black dye composition for pure black karakul leather with acid dyes is as follows

Table №3
The developed composition of the copmosis

№	Components	Reagent consumption
1.	Ammonia (25%)	1,2 ml/l
2.	Surface active substances, OP-10	1 g/l
3.	Acid dyes	3-4 g/l
4.	Sodium sulfate	3-4 g/l
5.	Acetic acid	3-4 g/l

It is noted that the fur coating of black karakul leather dyed with the developed composition has light and abrasion resistance.

According to the optimal variant of the process, the high concentration of the dye was 3-4 g/l, and ph 4.5-5.

Subsequent treatment of black and white skins dyed according to the optimal dyeing process was carried out on the basis of the existing technology.

The following parameters were achieved in determining the chemical, physical and mechanical properties of the finished product obtained using the advanced technology by existing experimental methods. Figures are given in the table.

The increased content of chromium oxide in karakul skins and increased resistance to high-temperature cooking did not reduce the quality of karakul skins.

Chemical, physical, and mechanical properties of the dyed skins were determined by the improved dyeing process.

Table №4
Chemical, physical and mechanical properties of astrakhan leather

Name of indicators	Developed technology	Existingtechnologyinproduction	Requirements
Amount of moisture	12,5	12	No more 14
Unbound fats	18,5	19	15-20
Chromium oxide	2,5	1,8	0,5-1,5
pH-environment	4,5	6,3	3,5-7
Welding temperature, ^{0}C	65-70	55-60	He 50-55
Elongation strength, Pa	1,9	1,8	No less 0,7

The use of acid dyes for dyeing the black color of mink, fox and other valuable fur skins is associated with certain difficulties, the main reason for which is the heterogeneous structure of different categories of hair. Pinned hair, having a more closed structure, is less susceptible to dyes and painted much harder than down hair. This is especially obvious when dyeing black. In this case, it is more appropriate to use oxidative dyes, whose molecular weight is much lower, respectively, the diffusion into the closed structure of the fibers proceeds with less difficulty. Nevertheless, acidic black dyes are successfully used for dyeing sheepskin and karakul hair, as well as in cases where a darker tone is required in color dyeing.

Dyeing karakul skins with acidic dyes using the developed technology leads to improved sanitary and hygienic working conditions in production, reduction of dye losses and refusal to use oxidizing dyes when dyeing karakul skins.

In conclusion, the processing of karakul skins on the basis of advanced technology creates strong bonds between wool and dye. Dyeing with acid dyes has also improved the quality of the finished product, which means that the wool coating of the karakul leather has a high shine and elasticity.

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