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### **Specificities of the workflow and evaluation of the working conditions of the working main professions of industrial rubber and technology production**

In the available literature there is a large number of diverse works on the assessment of the labor process and working conditions of industrial rubber production. At the same time, it is of interest and there is a practical need for a sanitary-hygienic assessment of the working conditions of workers in basic occupations who are in contact with chemical substances of a general toxic and irritant action during production. The production of industrial rubber products is based on a multistage intermittent technological process using numerous chemicals of the second, third and fourth classes of toxicity. During a work shift, production personnel is exposed to fractional and short-term exposure to toxic substances, therefore, the toxic effects of chemicals used in the industrial rubber industry to workers are enhanced, which was the purpose of the study. To assess the work process and the working conditions of the workers of the main occupations of industrial rubber production, the study of air dustiness, microclimate, and relative humidity was conducted. As a result of the research, it was established that one of the unfavorable production factors at the factory of the industrial rubber products is dustiness, air pollution, overcooling, overheating and considerable physical stress.

**Keywords:** industrial rubber production, technological process, toxic chemicals, dust formation, gas formation.

Currently, there is a lag in the growth of labor productivity, as evidenced by information and analytical materials about the dynamics of economic indicators in industries with harmful working conditions and hard work. Over the past decade, the share of people working in hazardous working conditions in organizations of various types of economic activity has increased significantly [1].

Certification of work places for the production of rubber products showed that the chemical factor is potentially dangerous in the studied production. In the air of the working area there were chemicals of I-IV hazard classes — dichloromethane, gasoline, styrene, benzopyrene, and sootortalc, which have a harmful effect on organs: the nervous system, blood formation organs, cause liver damage, have mutagenic properties [2].

The identification of a group of chemical factors of the production environment in the manufacture of flexible rubber products must be carried out, since aggressive media and components with irritating, sensitizing, fibro genic, carcinogenic and general toxic properties are used. Toxic stabilizers rubbers and, especially the nitrous and amino compounds of the aromatic series. Some chemicals can have a combined effect on the human body, others aggravate the effects of each other [3].

Industrial rubber production is a sub-industry of the petrochemical industry. It is characterized by high labor intensity and material consumption, due to the presence of a large number of manual operations necessary to ensure the technological process and the consumption of various materials (rubber, carbon black, etc.). Each ingredient gives rubber certain properties and it introduced into the mixture in a certain amount. Ingredients are divided into: 1) vulcanizing agents — sulfur, dithiomorpholine, zinc oxide, magnesium oxide, etc.; 2) vulcanization accelerators—tetraethylthiuramdisulfide, diphenylguanidine, captax, altax, sulfonamide and etc.; 3) activators — zinc oxide and etc.; 4) antiageing agent — neozone, aldol, quinol, unglazed porcelain, acetone anil, phthalic anhydride etc.; 5) reinforcing fillers or enhancers — carbon and etc. (to impart high tensile strength and high tear and abrasion resistance); 6) inert fillers — rubarx etc. (to ensure the process of mixing rubber compound, make it mangled and spewed) 7) coloring agent — antimony compounds, cadmium sulphide and etc., 8) fluidizing agent (softening agents) — petroleum oil flux, bitumen cutback and etc. According to the degree of toxicity, chemicals used in the manufacture of rubber include II, III, IV levels of toxic: antimonous acid anhydride, sulphur dioxide, cinnamene (II level), diphenylguanidine, tetramethylthiuramdisulfide, thiazone, carbon disulfide, carbolic acid (III level), scrape, black pigment, white zinc, dibutylphthalate (IV level) [4].

The factory workers of rubber products working on the main technological lines are affected by a complex of unfavorable production factors, the main of which are unfavorable microclimatic conditions, dustiness and air pollution. During a work shift, production personnel is exposed to fractional and short-term exposure to toxic substances [5].