Hygienic Characteristics Of Harmful Factors In The Production Of Construction Materials

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ABSTRACT

The article presents the results of a study of the features of the technological process and hygienic assessment of harmful factors in the production of ceramic-faced tiles.

Keywords: manufacturing enterprise, working conditions, technological process, raw materials, dust, microclimate, noise, preventive measures.

The relevance of the problem. The creation of a safe and comfortable environment for human habitation is the basis for the socio-economic development of the country. In recent years, a great deal of work has been carried out in the Republic of Uzbekistan to build new facilities for various purposes in order to modernize the construction industry [4,6,9].

To achieve this, it is necessary to increase the production of building materials, including ceramic tiles. The production process of this type of building material takes place in conditions that can negatively affect the health and performance of workers [2,5,8,11].

As a result of the literature analysis, it was found that the literature does not contain enough information on occupational hygiene issues in the production of ceramic coated tiles [1,3,7,10,12].

Purpose of the study. To determine the level of harmful factors created during the production of ceramic-coated plates and to develop preventive measures to prevent their impact on the body of workers.

Materials and methods. During the inspection, the microclimate and noise indicators were established, which are formed depending on the nature of the technological process at the main workplaces, the degree of dustiness and gas contamination of the air of workplaces, determination of the level of illumination, as well as the basis for the hygienic classification of working conditions according to the indicators of harmfulness and danger of factors of the production environment, the severity and intensity of the work process sanitary norms and rules № 0069-24.

Results and discussion. The studies were conducted at a building materials manufacturing plant located in Tashkent during warm and cold periods of the year. Ceramic coated tiles produced at the enterprise under study are widely used in the construction process. The technological process of production of these coatings consists of conveyor lines. Gray kaolin, porphyry sand, bentonite and other substances are used as raw materials in the production of ceramic coated tiles. The peculiarity of the technological

process is as follows: first, all pre-weighed raw materials are fed through a special technological line to the mixing shop, where all materials are poured into the mill, water is added to them and they are thoroughly mixed. The finished mixture is pressed into a mold and sent to dry and then the dried slabs are sanded. The final stage of the technological process is heating the plates. To do this, it is sent to sorting and packaging areas after heating in roller conveyor ovens heated to 1000°C. The study of working conditions revealed that the leading harmful factor at this production enterprise is dustiness of workplaces, and the results obtained were hygienically assessed in accordance with State Standard No. 12.1.005-88 «General Sanitary and Hygienic Requirements for Workplace Air».

It turned out that the amount of dust varies at different stages of the technological process. The silicon oxide II content was found to exceed 70%. The largest amount of dust was determined in the mixing zone and amounted to 23,5 mg/m^3, during the pressing process – 22,8 mg/m^3, at the grinding stage – 2,9 mg/m^3, in the sorting zone – 1,8 mg/m^3.

Carbon monoxide was detected during chemical tests in the air of the work area where the furnaces were located. The average amount of carbon monoxide in the workplace was 25 mg/m^3, and the maximum was 40 mg/m^3. The obtained indicators were given a hygienic assessment in accordance with Sanitary Rules and Norms №0294-11 "Permissible Norms of Harmful Substances in the Air of Workplaces". For the hygienic assessment of microclimate indicators, Sanitary Rules and Norms №0324-16 «Sanitary and Hygienic Standards of Microclimate in Production Buildings» were used. During the cold period of the year, the air temperature in the mixture preparation zone was 18^0 C, relative humidity - 66%, air speed – 0,4 m/s and in the pressing zone - 13^0 C, relative humidity - 54%, air speed – 0,1 m/s, air temperature at the plate heating workplace - 28^0 C, relative humidity - 58%, air speed – 0,2 m/s.

The same microclimate indicators were studied during the warm period of the year, according to it, the air temperature in the mixture preparation zone was 28^0 C, relative humidity - 58%, air speed – 0,3 m/s, and in the pressing zone - 30^0 C, relative humidity - 46%, air speed – 0,1 m/s, air temperature - 39^0 C, relative humidity - 46%, air speed – 0,2 m/s in the heating zones. The obtained results showed that the most unfavourable microclimate conditions developed in the area of heating stoves, which was caused by periodic increases in air temperature to 42^0 C. It has been established that the level of illumination in almost all workplaces is 2 times lower than the norm.

Work at all stages of the labor process is carried out using various mechanisms, which leads to the creation of industrial noise. It has been proven that the permissible level of broad-band noise in the areas of mixture preparation and pressing exceeds the standard specified in the Sanitary Rules and Norms №0325-16 «Sanitary Standards for Noise Levels in Workplaces» by 4-6 dBA.

Exceeding the norm of harmful factors created during the production of ceramic-coated plates may lead to an increase in the level of temporary illnesses and the development of occupational diseases. It has been established that viral respiratory infections, bronchitis, tracheitis and radiculitis are most often found among workers at the enterprise where scientific research was conducted.

Conclusion. At this enterprise it was shown that the main harmful factors at the main workplaces are industrial dust and heating microclimate.

It was proven that the general working conditions at the ceramic tile manufacturing enterprise correspond to the class III harmfulness level II according to Sanitary Norms and Rules №0069-24 «Hygienic classification of working conditions according to the indicators of harmfulness and danger of factors of the production environment, the severity and intensity of the work process».

Thus, during the period of scientific and technological progress, working conditions and the organization of the work process will change, which will pose a number of important tasks for specialists in the field of preventive medicine and will require constant study of this branch of production.

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