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Hygienic Aspects of Studying Working Conditions in Furniture Production

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Abstract: the working conditions of furniture production workers according to the hygienic classification of working conditions in terms of harmfulness and danger of factors of the working environment, the severity and intensity of the labor process can be characterized as "harmful" of the third class of the second degree of working conditions (3.2). Our research allowed us to substantiate the priority areas of the system of preventive measures aimed at reducing the negative impact of labor process factors on the health of workers.

Key words: occupational health, furniture production, working conditions, harmful factors, hygiene standards.

Introduction

Any labor associated with production activities is supported by our state in every possible way. The organism of workers is exposed and more sensitive to the influence of most negative factors of the working environment, and therefore the improvement of working conditions for workers is the most important social and hygienic task. When studying the factors of the production environment, it is necessary to identify the role of the leading production factors, correctly assess their significance for the body of workers on the basis of establishing quantitative and qualitative patterns, which was carried out in our scientific work.

In modern furniture production, along with old technological equipment, new, more productive machines and machines are used, which greatly facilitate physical labor. However, it should be noted that even modern equipment can aggravate the impact of certain production factors on the body of workers, which leads to an increase in morbidity, reduces efficiency, and contributes to the rapid development of production fatigue. On the basis of the results obtained, science-based preventive measures have been developed aimed at improving the working environment and maintaining the health of workers in the furniture industry.

Material and Methods

The studies were carried out at one of the furniture productions in the city of Tashkent, which includes a procurement workshop, milling and grinding sections, assembly and paint shops. In these areas of production, among the production and sanitary factors, the leading ones are noise, dust and gas contamination of the air in the working area, high temperature and insufficient lighting. Approved research methods in occupational health were used - sanitary-hygienic, laboratory-instrumental and statistical.

Results

At all stages of the technological process of furniture production, the combined effect of a complex of harmful production and sanitary factors of the labor process is characteristic: noise, dust and gas content in the air of the working area.

Discussion

Workers in the furniture industry and its main workshops are mainly exposed to intense noise and vibration during their work. The main sources of intense noise are milling, grinding and drilling machines, equipment, tools (hammers, jointers, etc.), fans, air conditioners, shop carts and vehicles. The intensity of

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noise also depends on the organization of the technological process, the number of working machines, their technical condition. When studying the noise at the main workplaces of the procurement workshop, it was determined that the noise is mechanical, constant in origin, and mid-frequency sounds predominate in its spectral composition. Its sections are characterized by noise of a similar origin, but with a predominance of constant high-frequency noise. When measuring the noise level in the harvesting shop at the workplaces of the harvesters, the total noise level exceeds the permissible values by an average of 2-15 dBA. The maximum excess of the noise level was noted at the main workplaces of the milling section by 6-20 dBA. At the workplaces of the grinding section, noise levels also exceeded the permissible levels. So, at the workplaces of grinders, noise was noted with a maximum intensity of up to 88.6 dBA.

When measuring the noise level in the assembly and paint shops at the main workplaces, the total noise level does not exceed the permissible values. The study of the spectral composition of industrial noise showed that its level in the procurement shop at all frequencies, except for 63 and 125 Hz, was above the maximum permissible level established for these frequencies. Equipped machines generate noise with a predominant frequency of 250 Hz. Thus, the maximum of sound energy falls on the region of high frequencies. It was determined that workers experience the greatest sound pressure at milling and circular machines in octave bands with geometric mean frequencies of 1000 and 2000 Hz, where sound pressure reaches 100 dB or more. The hygienic assessment of industrial noise showed that obsolete domestic machines are the main sources of noise. So, domestic-made machine tools, which are currently widely used at the enterprise, generate high-intensity noise. The use of newer machines allows you to reduce the noise level in the frequency range of 500-8000 Hz.

In furniture production, at all technological stages, dust of a mixed composition is formed, polluting the air of the working area. The process of processing sawn timber is accompanied by a significant release of dust into the air of the working area, the largest amount of which is observed in the procurement workshop at the main workplaces near sorting machines. The wood dust released into the air of the working area is mixed in origin and consists of mineral impurities (earth, sand), as well as inorganic substances containing silicon dioxide. Dust according to the method of formation is an aerosol disintegration.

We noted that the concentration of dust in the air of the working area decreases in the course of the technological process: the farther from the preparatory shops, the lower the dust content of the air. It has been established that the dust content of the air in the working area also depends on the period of the year (higher in the warm period) and the operation performed. Thus, the highest concentrations of dust in the air were noted in the working area of the workers of the blanking shop and the grinding section. At other workplaces, dust concentrations were somewhat lower or met hygienic standards. The highest concentrations of dust were noted in the air of the working area of the harvesting shop during the warm period of the year, while its maximum concentrations exceeded the permissible values by 4-6.2 mg/m^3. At the workplaces of the grinding section, the maximum concentration of dust reached an average of 10.3 mg/m^3. Dust concentrations in the air of the working area of the milling section, assembly and paint shops during the warm period of the year met the hygienic requirements or minimally exceeded the MPC (6 mg/m^3). In the cold period of the year, the dust content at all stages of production was significantly lower than in the warm period by 2-3 mg/m^3, mainly due to increased air humidity.

One of the harmful production factors in the studied production is chemical. At the same time, formaldehyde, ammonia and carbon monoxide are released into the air of the working area. When applying paints and varnishes to furniture parts and their subsequent drying, there is an intensive evaporation of volatile substances that are part of nitrocellulose and polyester varnishes and enamels and combined solvents that are dangerous for workers. In the breathing zone of dyers, in the areas of coating with a pneumatic spray, toxic substances were found in concentrations significantly exceeding the maximum allowable: acetone - an average of 1.9 times, butyl and ethyl acetate - 2 times, toluene and xylene - 1.2 times.

We also found that chemical pollution of the air in the working area also occurs due to vapors released during the preparation of paints and varnishes. The variety of components that make up these dyes is very high, their combined effect is more dangerous than non-combined.

Conclusion

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Studies on the hygienic assessment of working conditions in modern furniture production have shown that workers are exposed to a complex of adverse factors, the parameters of which in a significant number of cases do not meet hygienic requirements. According to Sanitary rules and regulations No. 0141-03 "Hygienic classification of working conditions in terms of harmfulness and danger of factors of the working environment, the severity and intensity of the labor process," the working conditions of workers in the furniture industry were assessed in terms of harmfulness and danger and can be characterized as "harmful" of the third class of the second degree of working conditions (3.2).

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Our research allowed us to substantiate the priority areas of the system of preventive measures aimed at reducing the negative impact of labor process factors on the health of workers.

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