NOISE AND VIBRATION IN THE PROCESS OF WORKING WITH A COMPUTER AND THE REQUIREMENTS APPLIED TO THEM

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Abstract: *This article contains information about noise and vibration that occurs during computer work, and the content and essence of the topic is revealed through information about how noise and vibration occur, their negative effects on people, and how computer workers can be protected from noise and vibration.*

Key words: *Noise, vibration, frequency, mechanical vibration, sound pressure, harmful factor, dangerous factor, octave, infrasound zone, ultrasonic zone, noise absorber, personal protective equipment*

Noise is one of the most widespread physical factors in production. Noise is a set of sounds of different frequencies, different speeds, different heights, and varying power in the unit of time, which have an unpleasant effect on the body. From a physical point of view, sounds are propagating mechanical oscillating movements in the audible frequency range.

Noise and vibration are the oscillating motions of particles in an elastic medium that propagate in a wavelike fashion. The effect of noise and vibration on a person depends on the frequency of vibrations. Vibrations with a frequency of less than 16 Hz affect a person like tremors. Noise affects a person primarily through the auditory organs and injures the nervous system. That is why a person must constantly protect himself from noise. Under long-term exposure to noise, a disease occurs in the human hearing organ. At the same time, the nervous system goes out of control, as a result of which blood pressure and diseases of the organs of vision occur.

Mechanical vibrations are characterized by amplitude and frequency. Amplitude is the largest indicator of pressure change in compression and rarefaction, frequency is the number of complete vibrations in one second. Its unit of measurement is one vibration per hertz-second. The larger it is, the greater the sound pressure and the louder the sound. Sound pressure is measured in bars. A bar is a pressure equal to one millionth of the atmospheric pressure or 1mg/cm2. Receives frequency sounds from Hz to 20000 Hz. Below 16 Hz is the infrasound zone, and above 20000 Hz is the ultrasound zone.

The physiological nature of receiving the frequency structure of sounds has shown that hearing changes not according to the absolute increase in frequency, but rather according to the relative increase. A doubling of the vibrational frequency is considered an octave, just like the pitch of a tone. An octave is a range of frequencies whose upper limit is twice as blind as the lower limit. The entire audible frequency

range is divided into 9 octaves with geometric mean frequencies. That is 16,31,63,125,250,500,1000,2000,4000,8000 and 16000 Hz.

Vibration is considered a mechanical vibration force that directly affects a person, and since it is repetitive, we say that it has a wave concept. As the vibration increases beyond the norm, a person suffers from nervous diseases, bone joints and muscle diseases. Workers exposed to vibration are required to use vibration-reducing equipment.

Before protecting against the effects of noise and vibration, measures to reduce them are determined by using extinguishers, insulation, absorbing devices. In order to reduce the noise, sound absorbers, wrapping noise sources with barriers, the method of hanging noise-absorbing materials of various shapes in the room, and various types of textile materials are used. In addition to noise reduction, personal protective equipment - earmuffs are used to reduce their impact on the worker.

Vibration-absorbing devices are used to protect against vibrations, such as installing soft materials, bases made of materials with different spring or elastic properties. For example, the reduction of vibration can be observed at home by placing four soft rubber clips on the base of an ordinary household sewing machine.

People mainly suffer from nervous diseases due to noise exposure. In addition, it has been known until now that excessive noise can cause damage to the eyes, gastrointestinal functions of a person. That's why measures and measures against noise are considered important.

At the heart of noise moderation is sound moderation. Some of the standard norms (SM) and GOSTs adopted for this purpose include the following objectives:

- GOST 12.1.003 - 83 - sound standard, dBA, for production enterprises and vehicles;
- SM 3077 - 84 - noise regulation of residences and buildings, permissible noise standard;
- Construction standards and regulations II- 12 - 77 - regulation of noise in residential and public buildings and territories.

As a result of the vibration, people mainly get nervous diseases. In addition, diseases of internal organs, especially diseases of bone tissues, as a result of which even the wrong growth of bone joints, that is, crookedness, are observed. Taking into account these, regulatory requirements are set for vibration.

In order to regulate vibration, the following standard norms and GOSTs have been adopted:

- GOST 12.1.012 - 90 - labor safety standards system. General requirements of vibration safety;
- GOST 16519 - 78 - hand machines. Methods of measuring vibration parameters;
- GOST 12.4.002 - 74 - hand protection against shaking, personal protective equipment. General requirements;

 GOST 12.4.024 - 76 - special shoes that protect against vibration. Special technical requirements. Protection against vibration and noise.

Noise and vibrations cannot be allowed to exceed the standard for workers. even when permission is given for short-term, necessary cases, working time is reduced using protective equipment.

In the process of working with a computer, noise and vibration can have a negative effect on the human body - it can cause various accidents and occupational diseases due to fatigue, various pains. When exposed to intense noise (95-100 dB) for a long time, some employees get a headache, they get very tired, and they get angry quickly. Then the hearing organs fail. Noise and vibration together have an even worse effect on a person. When a person is exposed to a vibration with a certain parameter for a long time, the central nervous system is damaged, the veins of the fingers become tense and numb. Even serious changes in bone growth are observed. That is why special attention is paid to vibration isolation in computer rooms. Sanitary standards for sound pressure and vibration are specified in SM 245-71. Levels of noise and vibration forces are determined using IShV-1 measuring device. It measures sound pressure levels from 30 to 150 dB in the frequency range from 22 to 12,000 Hz. Noise meter Sh - 71 operates in the range from 31.5 to 8000 Hz and measures the sound pressure level from 30 to 140 dB. Other types of noise meters are also widely used, for example, noise meters of the PSJ type produced by the German company RFT.

In conclusion, it can be said that computer workers in labor protection, i.e. in protection from noise and vibration, if the standard norms (SM) and GOSTs adopted for noise regulation as mentioned above and the standard norms and GOSTs developed for the purpose of vibration regulation are followed, then workers will not get occupational diseases and their health will be preserved.

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