

SECTION "LABOR SAFETY"

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RECOMMENDATIONS FOR PREVENTING PROFESSIONAL DISEASES FROM EXPOSURE TO NOISE AND VIBRATIONS IN MINING AND CONSTRUCTION ENTERPRISES

The employer is obliged to conduct effective monitoring of working conditions, the process of which is associated with such hazards as increased noise and vibration. For example, vibration control of machines and mechanisms, which is carried out constantly (once a year), selective control after each repair or when the mechanism changes (state sanitary standards SSS 3.3.6. 039-99 clause 9.6).

Preventive measures can prevent the appearance of diseases from exposure to noise and vibration.

In Ukraine, the minimum safety and health requirements when using personal protective equipment at the workplace are indicated in regulatory document No. 1804 of November 29, 2018. These minimum requirements are developed based on the EU Directives, namely: No. 89/656 and part 1 of Article 16 № 89/391. In addition, general and local production vibrations are regulated by state sanitary standards No. 39, Recommendations for the protection of workers from occupational hazards No. 156 and Recommendations on the selection, use, appearance and maintenance of hearing protection (EN 458: 2004, IDT) DSTU EN 458: 2005, № 187.

In accordance with paragraph 5 of the Minimum Requirements No. 1804, hearing protection in case of exceeding the noise level of more than 80 dB, it is recommended to use headphones, earbuds, and noise protection helmets - for such work:

- on metal presses;

- with pneumatic tools, perforators;
- during operation and maintenance of pumping equipment;
- with copra for clogging pallets;
- ground personnel at airports;
- in the woodworking industry.

For each employee, his / her card of personal protective equipment and a table of risks should be compiled to justify the selection and use of personal protective equipment following normative document No. 1804.

To protect the hearing organs of personnel from the negative effects of various noises, personal protective equipment must be used, which must comply with EN 352-1 and EN 352-2.

To protect the face and head must be used anti-noise headphones complete with helmets and shields.

The analysis of statistics of noise and vibration occupational morbidity among workers in the mining and construction industries allowed us to develop the following measures for the prevention of diseases.

1. Each type of protection (headphones or earbuds) should be selected for specific working conditions depending on the prevailing frequency range of noise exposure at the workplace (Table 1).

Table 1

Technical characteristics of personal protective equipment								
Frequency Hz	63	125	250	500	1000	2000	4000	8000
Headphone/Antinoise Performance								
Attenuation coefficient, dB	4,0/ 33,4	3,1/ 34,1	1,9/ 35,5	8,6/ 37,6	29,0/ 34,9	29,7/ 35,7	37,1/ 42,5	31,9/ 44,1
Deviations, dB	2,0/4,6	3,6/4	2,4/4,6	2,7/4	3,0/5	3,2/2	4,0/2,9	6,3/4,2
Protection margin, dB	9,0/ 28,8	9,5/ 29,4	9,5/ 30,9	15,9/ 33,5	26,0/ 29,9	26,5/ 32,9	33,1/ 39,6	25,6/ 39,9

2. Headphones are recommended for the following types of work (at a noise level of 120-125 dB): in stationary mine installations, tunneling pneumatic equipment, during drilling, and during compressor maintenance.

Reusable liners (made from flexible polymers) are recommended for noise protection at 105-110 dB. Disposable liners are recommended for workers in mining and construction enterprises when exposed to industrial noise with a level of 100-105 dB.

3. Miners and builders who work directly with sources of increased noise and vibration should comply with recommendations on the regime of work and rest (Table 2).

Table 2

Recommendations of work and rest for workers working when exposed to noise and vibration

№	Mode of operation	Measures to prevent the negative effects of noise and vibration
1	monthly	Uniform distribution of days off and days of work. The total monthly duration of work with negative factors is no more than 18 days.
2	weekly	The transition to different work shifts must be done every 5 days.
3	daily	Prohibition of excess work. Reduced night shifts. Rest between work shifts for at least two shifts.
4	shift rotation	Distribution of the technological operating time schedule with constant contact with noise and vibration - with an obligatory double additional break. The first break must be lasting 20 minutes - after the first two hours of work. The second break must be lasting 30 minutes - after two hours of afternoon work. For work with noise and vibration that is not constant during the shift, it is recommended that it must be regularly alternated work with and without negative noise and vibration factors.

4. Constant monitoring of the health of workers and regular preventive physiotherapeutic procedures for their recovery is necessary.

Compliance with the proposed recommendations will prevent possible occupational diseases from exposure to noise and vibration, extend the able-bodied age of skilled workers and improve the work culture.

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LOGIC AND LINGUISTIC MODELING ACCIDENTS AND INJURIES

The most promising approach to taking into account all the essential factors in predicting anthropogenic risk is logical-linguistic mod-