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NOISE IMPACT ON WORKING WOODCHIP BOARD

High noise level in the production of particle is one of the main occupational hazards at the Joint-Stock Company “Ivatsevichidrev”. Studies have shown that the maximum excess of permissible levels observed at mid and high frequencies, the most harmful to humans. In the workplace, levels from 1 to 14 dB were measured at workplace of shaving machine operator and the operator of the sorting chips machine PESSA, from 3 to 17 dB at machinist cutting board, from 1 to 4 dB at separator operators workplace. To reduce the harmful effects of noise, new sound insulating cab design was developed for the operators of these jobs.

Introduction. The general situation with the protection and working conditions is not very optimistic in the Republic of Belarus. Over the past five years there was an increase to 26% of workers employed in the working conditions that do not meet health and safety standards in organizations.

Due to poor labor conditions, industrial and occupational diseases incurs material losses. Thus, only annual insurance payments from the compulsory insurance from industrial accidents and occupational diseases in the Republic of Belarus are more than 100 billion rubles. [1].

The high level of noise at work is a major occupational factor affecting workers during the manufacture of woodchip boards. Loud noise causes difficulties with recognition of color signals, reduces visual acuity, disturb the perception of visual information and hamper verbal communication necessary for safety.

Long impact of a higher level of noise on human leads to nervous exhaustion, lowers pro-

ductivity of employees, increases the risk of accidents.

We also know that any deflection of working conditions from health standards makes the human body to expend additional energy to counteract the adverse effects of harmful and (or) dangerous working factors. Thus in case of the intensity of noise to 90 dB worker spends on the average 20% more physical and neuropsychiatric effort to keep the scope of performed work which he does at an intensity of noise – 70 dBA [2]. Sudden impulsive noises are more dangerous because in this case defense mechanism that protects the human ear from damage hasn’t enough time to trigger.

Main part. The authors have investigated the noise characteristics of some workplaces by manufacturing line of woodchip board. For research they chose: work place chipper PESSA operator, operator of inertial separators, format cutting board operator with the most adverse conditions for noise.

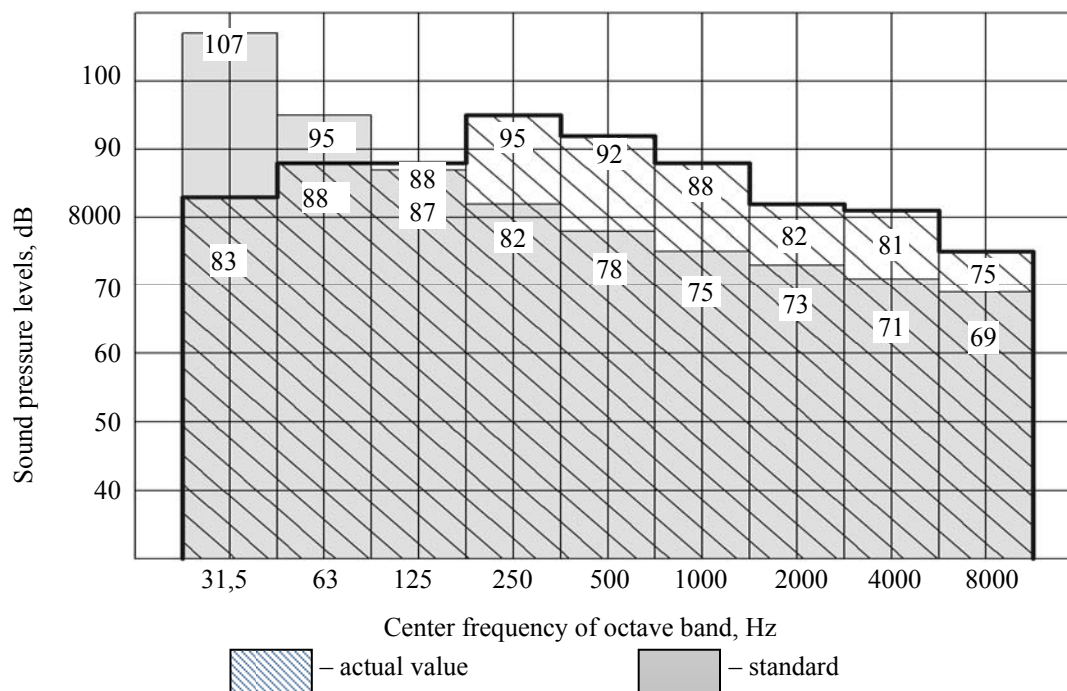


Fig. 1. Spectral characteristics of sound pressure level at the workplace of chipper PESSA operator

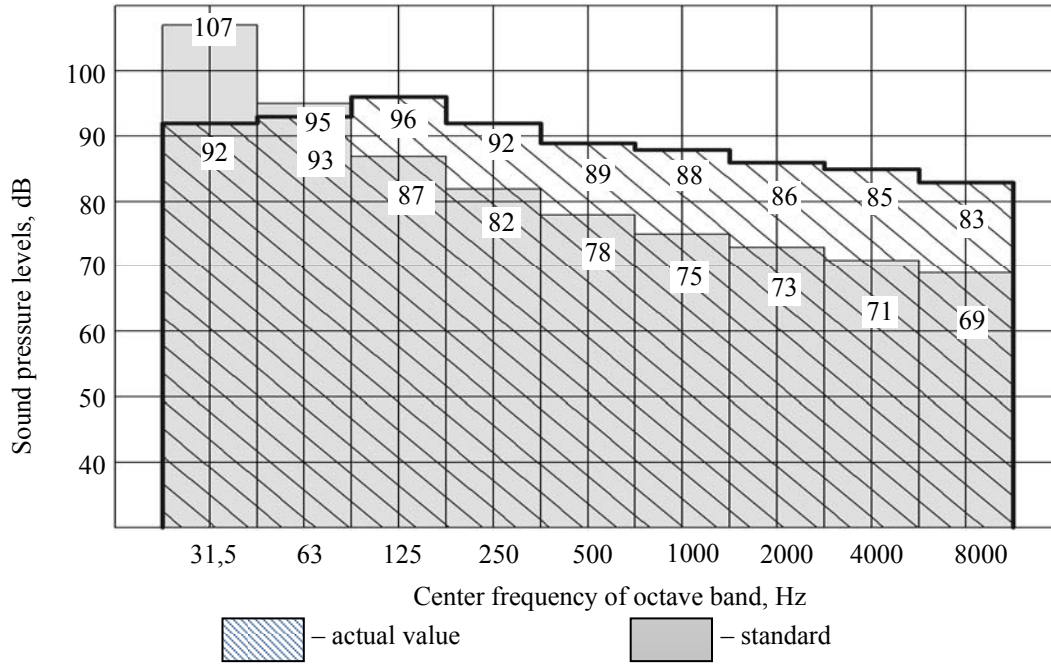


Fig. 2. Spectral characteristics of sound pressure level at the workplace of chips sorting operators.

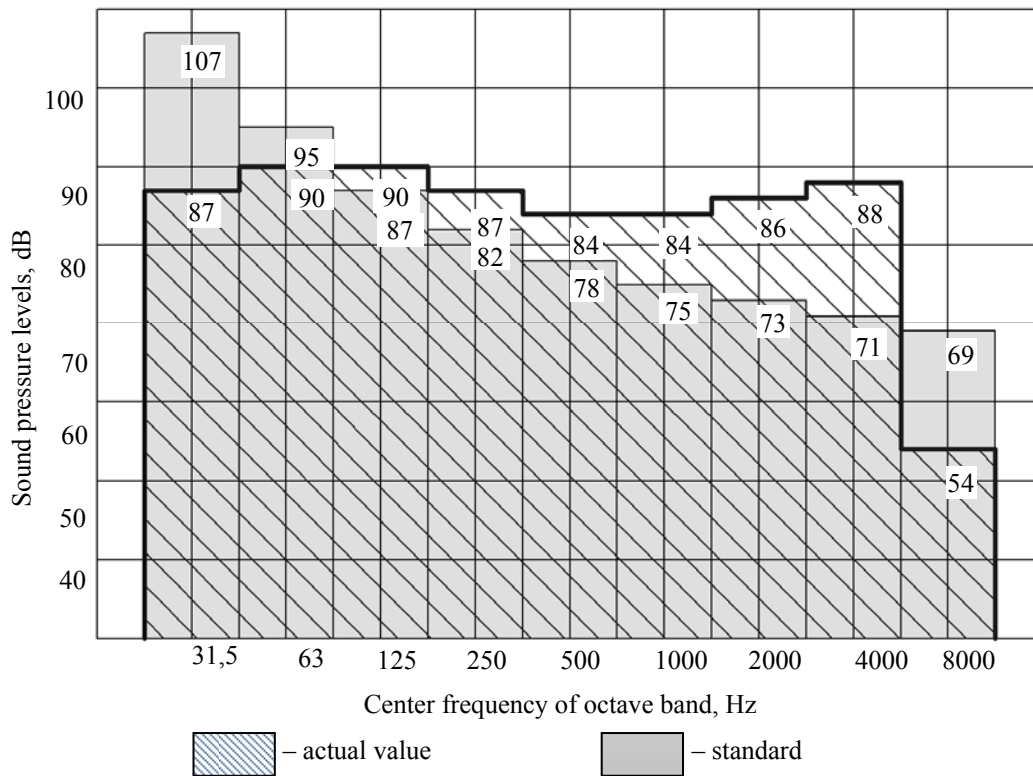


Fig. 3. Spectral characteristics of sound pressure level at the workplace of format trimming plate operator

Soundproofing cabins for protection against noise are installed at these work places.

The objective of the research included the verification of the effectiveness of installed acoustic cabins.

The researches were conducted by the method described in ISO 12.1.050-86 SSBT “Methods for measuring noise at the work places” using an integrating sound level meter-vibrometer Shi-01V. [3].

The results of research showed the elevation of acceptable levels occur at all work places. The results are shown in Fig. 1, 2, 3.

The biggest excess of acceptable levels observed in the mid and high frequencies (Fig. 1, 2) at the workplace of the chipper PESSA operator and sorting chips operator from 1 to 14 dB, at the workplace of format cutting boards operator – from 3 to 17 dB.

Spectral noise analysis showed that the excess at the work place of sort chips operator is from 1 to 14 dB, at the workplace of format cutting board operator from 3 to 17 dB, at the workplace separator operators – from 1 to 4 dB at the most harmful to human high frequencies.

Measurements carried out in soundproof cabin, have shown their ineffectiveness as cabins have some significant drawbacks. All cabins have no proofness which facilitates the penetration of noise inside the cabin.

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Conclusion. Taking into account all above mentioned we propose to design the soundproofing cabin reducing the sound pressure levels inside the cab to acceptable and necessary microclimate indicators.

References

1. Седюкевич, А. Г. Меры по снижению воздействия шума на производстве / А. Г. Седюкевич // Охрана труда и социальное страхование. – 2010. – № 4. – С. 29–32.

2. Санитарные нормы, правила и гигиенические нормативы Шум на рабочих местах, в транспортных средствах, в помещениях жилых, общественных зданий и на территории жилой застройки: СНиП и ГН. – Введ. 01.01.12. – Минск: Министерство здравоохранения Респ. Беларусь, 2011. – 22 с.

3. Методы измерения шума на рабочих местах: ГОСТ 12.1.050–86 ССБТ. – Введ. 01.04.06. – М.: Государственный комитет по стандартам, 2005. – 16 с.

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