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NOISE AND PROTECTION FROM IT.IMPACT OF NOISE ON THE HUMAN BODY

Anotation: This article contains information about human protection from noise betrieb.Noise can exert a variety of stimuli on the human body.Various oncological and other diseases can also be due to this noise.

Abstract:sound pressure, sound frequency, noise, electricity, Alfonso Corti, background.

Within the five existing sensory organs of a person, hearing is of particular importance. It is through hearing that a person communicates with other people, realizes danger and exalts his culture. Through its auditory sensations, a person distinguishes between pure sounds, mixed sounds and noise. A pure sound consists of sinusoidal vibrations of the same frequency.

The environment that surrounds a person contains a wide variety of sounds that a person hears with the help of a hearing organ. Sound is a physical size, and only in an elastic medium (air, water, gas, etc.) diffuse, no sound diffuses in the vacuum environment.A mixed sound consists of the sum of several pure sounds. Noise, on the other hand, is a mixture of sounds of different frequency and vibration.In 1660, Robert Boyle (1627-1661yy) proves that a gaseous liquid or solid state medium is necessary for sound propagation. Depending on the environment that causes sound propagation, noise is mechanical and aerohydrodynamic in appearance.The unit of measurement of sound intensity "waist" is adopted. It was named in honor of Alexander Greyama Belle (1847-1922), the founder of the creation of the telephone. The human ear can hear sounds of the same pressure, of different frequency and hardness. Sound hardness (gromkost)- measured with a"background".One background is equal to the sound hardness at a frequency of 1000 Hz and an intensity of 1dB.

Human ear 16 Hz.from 20000 Hz.has the ability to hear sound frequencies up to. Man 800...Sounds with a frequency of 4000 Hz are well heard, 16...Sounds with a frequency of 100 Hz can be heard significantly.

In 1861, the anatomical scientist Alfonso Corti (1822 – 1876) examined the auditory organ of Man - the ear-and examined its mode of operation.

Usually, when we say ear, We understand the eardrum (Supra) in appearance. An internal auditory passage ran from this ear Supra towards the skull, which is 2 cm in adult humans. up to. It is followed by a private hearing member, the middle ear, which is the drum cavity. It is bounded by a drum curtain from the outer hearing path. In the drum cavity are located three small bony-hammer, namely the inner humerus and hearing Bony. In each sound wave, hammerhead ostriches affect the toga, and the toga in turn affects the auditory ostriches. These vesicles strengthen the vibrational amplitude of the drum curtain up to 2-3 times. And after the middle ear is a spiral tube, which will be filled with a specific liquid. A membrane is hidden in the spiral tube, which is made up of about 16 thousand sensory fibrous cells. It is known as the "member of the court" in honor of Alfonso Corte.

The sound wave is transmitted from the drum curtain through the bony into a spiral tube, and at this time vibration is spread across the membrane. The tremor moves the fibrous cells in the"kort member", as a result of which the cells bend, twist and deform, and electrical signals are formed in it. These electrical signals stimulate the auditory nerves. These conditionally marked electrical impulses are transmitted to the brain, and it is realized by processing in the brain. Having the ability to give such mechanical vibrations into electrical impulses, the human ear can hear sound intensity from 0 to 130 db. But, a person is affected differently by sounds of different frequencies. For the purpose of

physiological assessment of the impact of noise on a person, it has a low frequency (300 Hz.up to), medium frequency (300...800 Hz) and is distinguished into high frequency (above 800 Hz) noise.

A person is affected by a certain level of noise, whether during the day or at night, during work, during rest, or during sleep. For example, the rustling of leaves is 10-40 db, the output of the clock is 25-35 db at a distance of 1 m from the ear, the breathing of a sleeping person is around 25 db, in ordinary spoken time –50-60 db, when talking with a hard shout -75 db, when moving at a speed of 100 km/h, a light car.

The fact that a person is exposed to constant high-intensity noise affects his health, he gets tired quickly, the speed of psychological reaction decreases, his memory weakens. Also, noise interferes with a person's concentration of attention, disrupts the accuracy and balance of movement, weakens the ability to receive sound and light signals, and, as a result, causes various accidents to occur. In addition, noise also leads to an increase in blood pressure, an expansion of the pupil, a violation of gastrointestinal activity, an acceleration of the heart and vascular beat, a violation of the nervous system, insomnia, and hearing impairment. Especially the noises that the human ear does not hear, namely infrasound (noises with a sound frequency of less than 16-20 Hz) and ultrasounds (sound frequency of 20,000 Hz.greater than) has a great impact on human health.

Basic units of measurement of sound :

The main indicators of sound mainly include : Sound frequency-unit of measurement Gers (Gts). It was erected in honor of the physical scientist Heinrich Gers (1857-1894). The number of oscillations per second is called the sound frequency. The frequency was measured by "Gers" (Gts) in honour of the physical scientist Heinrich Gers (1857-1894). One Gers (1gs) means one vibration per second. Sound pressure. Sinusoidal propagation of sound waves causes pressure changes at different points in the air environment. The difference between the air pressure generated by sound waves and the atmospheric pressure is called sound pressure. Sound pressure is measured in Pascal-1pa = 1n / m2. The human ear perceives changes in sound pressure starting from a pressure of ro = 210-5 Pa. Pain is produced in the ear when the sound pressure is 2102 Pa.

Harmful effects of noise on the human body:

Noise negatively affects the human body, causing various disorders to occur. The effects of noise are not felt at once, but are generated by working under the influence of constant noise over time, that is, causing various manifestations of nervous and mental disorders. In some cases, the influence on the nervous system affects the heart, brain and liver through eating, can cause hypertensive diseases. A 10-15% decrease in productivity under the influence of high frequency noise leads to a failure of the functioning of the auditory organ of a person and a deterioration in overall health.

The minimum sound pressure that a person receives through the ear is referred to as the hearing Start range, and it is 210 -5 Pa. is equivalent to. The maximum sound pressure received by the human ear is 10 mln from the onset diapozone. marta gets older, 2102 Pa.ga is equivalent to. Once the sound pressure exceeds this amount (2102 Pa), dizziness, recording, nausea, tearing of the eardrum and bleeding from the ear can be ruy.

Given the harmful effects of noise, it is classified as follows: according to the frequency of composition: low frequency; medium frequency and high frequency. depending on the width of the current frequency spectrum: short track; wide track. by the nature of the Spectrum: pulsed; tonal; stable and variable noise in time.

Noise level meowing and measurement:

Noise level normalization is one of the main measures aimed at reducing the negative impact of noise on a person. Since the impact of noise on human health depends on its frequency , a separately allowed noise level is set for each noise octave band (GOST 12.1.003-83). The highest allowable noise level was adopted for low frequencies, and the low allowable level was adopted for high frequency noise. For example, the smallest sound pressure is defined for workplaces where theoretical and scientific work is performed, which was assumed to be 30 db at an average geometric frequency of 8000 Hz. The highest sound pressure, on the other hand, is set for permanent workplaces, production buildings, machine and tractor cabins, which is 99 db at an average geometric frequency of 63 Hz.In Tonal and pulsed noise, the permissible noise level is reduced by 5dB compared to broadband noise.

To determine the noise level, Shum–1, ISHV-1 brand noise meters are used. Ash-2m, AS-3 brand frequency analyzers are used to estimate noise by spectrum frequency. These analyzers are octave by width, half octave, 1/3 octave, and short octave. For visual observation (visual observation) and imaging of sound Spectra, s-34 and SP-1 spectrometers and self-recording equipment branded N-110, N327-3 are used.

Noise protection tools and methods:

Reducing the impact of noise in production is carried out through the following measures:

1. Reducing noise at the resulting source.
2. Quenching noise in the path of propagation.
3. Using remote control devices.
4. Use of personal protective equipment
5. Preventive measures.

Noise protection methods vary, and it is chosen primarily depending on the noise source as well as the noise level. Since it is difficult to eliminate the negative impact of noise on human health and working capacity through one method, complex methods are used in practice. Such a complex method combines into itself the following activities: reducing noise, at the source of noise; changing the direction of noise propagation; acoustic processing of buildings; rational planning of the location of production buildings and plots; reducing noise on the path of propagation. Among these methods, it is most effective to reduce noise at the noise source. Machines and mechanisms are carried out by reducing noise, improving the quality of detail preparation, using low noise-generating materials, correctly selecting transmissions, timely replacement of eaten details, and the like. For example, replacing rolling bearings with friction bearings reduces the noise level by 10...To 15 db, replacing straight – toothed tires with Chevron tires-10 ...To 12 db, the use of transmissions with a wedge strap instead of chain transmissions – 10...To 15 db, to increase the quality of Assembly of Gears-5...Allows to reduce to 10 db. In addition, balancing rotating details also plays an important role in reducing noise levels.

It is known that the movement of gases and liquids in pipes results in aerohydrodynamic noise. In addition, such noises also occur during the operation of fans, compressors, pumps and internal combustion engines. Since aerohydrodynamic noise occurs as a result of non-volatile motion of gases and liquids, reducing them at the source of noise gives little effect. For this reason, such noise levels are reduced by installing noise attenuators in the noise path.

In electrical devices and machines, noises of an electromagnetic nature occur. The main reason for the formation of such noises is the vibration of ferromagnetic masses under the influence of changing magnetic fields. Such noise in Transformers is reduced by the dense placement of packets and the use of dempfer (vibration attenuator, absorber) materials.

Sound-reducing screens are used in isolating loudspeaker devices. Another of the ways to silence noise in production buildings is acoustic processing of buildings, the correct placement of buildings and tsexes. Capron fibers, porolone, mineral fluff, shishatola, porous polyvinyl chloride are used as sound-absorbing materials. Such porous materials absorb and attenuate super-and high-frequency noise to the maximum. If there is no possibility to silence and normalize the noise level through the above methods, personal protective equipment is used – earbuds and special tampons.

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