



TEAMSTERS

Safety & Health FACTS

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NOISE

Workers may be exposed to dangerously high noise levels in a variety of jobs and in virtually every workplace. Whether the job is a clerical position in an office environment, a heavy equipment operator in a landfill, or a lab worker in a hospital, noise is everywhere and Noise-Induced Hearing Loss is a serious consequence affecting the health of all employees.

Hazards of Noise:

1. Hearing Loss:

Intense noise may result in temporary or permanent hearing loss.

- ♦ Temporary hearing loss may be caused by a short exposure to noise. Normal hearing returns after a period of time. This recovery period may be only minutes or it may be hours, days, or even longer, depending upon the individual and the severity and length of the exposure.

After a day in an excessively noisy environment, workers may experience temporary hearing loss. A temporary hearing loss occurs when the nerves in the inner ear become tired and strained and fail to send messages to the brain. Normal hearing will return if the workers remain in a quiet environment and allow their hearing to recuperate.

- ♦ Permanent hearing loss may occur from exposure to intense noise for an extended period of time without protection. **IT IS PERMANENT AND CANNOT BE CORRECTED WITH A HEARING AID OR SURGERY.** Since permanent hearing loss often occurs gradually, many workers may not realize that they have permanently lost some of their hearing until it is too late.

After years in an excessively noisy environment without any hearing protection, workers may experience permanent hearing loss. A permanent hearing loss occurs when the nerves and cells in the inner ear become so damaged that they can no longer function properly. This prevents any messages from getting to the brain.

Normal hearing will never return.

Permanent hearing loss does not have to mean deafness. Many workers have permanent hearing loss in specific frequency ranges. This might prevent them from hearing high frequency sounds or low frequency sounds. These losses could interfere with a worker's ability to understand speech or function normally in society. Some workers lose their hearing over such a large range of frequencies that they are essentially deaf.

2. Other Health Effects:

Noise can also cause stress and increased blood pressure, and may contribute to heart disease and ulcers. Working in a noisy environment for long periods of time can make workers tired, nervous, and irritable. Noise has also been linked to insomnia and loss of appetite.

Noise may also be a safety hazard. Excessive levels of noise interfere with talking and hearing on the job. Communication difficulties can cause accidents in the workplace. Prolonged intense noise causes fatigue, which may also contribute to accidents.

Measuring Sound:

It is not necessary to use complicated equipment to tell if the level of noise is excessive and possibly damaging to hearing. Workers may be exposed to dangerously loud noise if:

- ♦ It is too noisy at work to be heard by co-workers at arms-length;
- ♦ It is hard to hear normal conversations, TV or music at the end of a working day;
- ♦ Workers experience ringing in their ears after working in noisy areas; or
- ♦ Family and friends notice that the worker's hearing is less acute.

Sound level is measured with a sound level meter and is expressed in terms of decibels. The decibel, abbreviated dBA, is the unit of measurement used to measure sound. It is important to understand that the decibel scale is not an arithmetic scale (1,2,3...). Rather, it is a *logarithmic* scale (10^1 , 10^2 , 10^3 ,...). The decibel is based on the logarithm of the ratio of a measured quantity to a reference. To summarize, this means that an increase in the dBA level is much more intense than it would appear. For example a decibel level of 90 dBA is equal to 1 milliwatt (mW) of sound power, but *three times* this sound power ($3 * 1 \text{ mW} = 3 \text{ mW}$) is equal to an increase of only 5 decibels, 95 dBA.

Most noise standards recognize a three-decibel "exchange rate". The exchange rate is the decibel level that equals a doubling of energy or pressure therefore, it is also called a "doubling rate". This means that an increase of 3 dBA is equal to doubling the sound pressure. Or by reducing the sound pressure level by 3 dBA, the noise "dose" would be cut in half. Therefore, an increase or decrease of three decibels is significant.

In the OSHA standard, a five-decibel "exchange rate" is used. That is, an increase of five decibels results in a doubling of the energy of the noise. And a reduction of five decibels results in reducing the "dose" by half. A practical example is as follows: OSHA allows exposure to 90 dBA for 8 hours, however if the noise level is increased by 5 dBA to 95 dBA, OSHA only allows exposure for half the time, 4 hours ($8/2 = 4$).

Continuous, Intermittent and Impact Noise:

A continuous noise is a sound that is relatively constant. An intermittent noise is one that has perceptible gaps between repetitions.

Impact noise is like a gunshot. Tools such as jackhammers, air-driven tampers, and other pneumatic tools are the classic examples of equipment that generate impact noise. Impact noise is often more harmful to the human ear than continuous or intermittent noise.

Controlling Noise Hazards:

Methods of reducing noise levels in the workplace include the use of engineering controls, work practices, and personal protective equipment as listed below:

- ♦ **Decrease noise production at the source:** Engineering controls can be used to decrease noise by enclosing or shielding noisy machinery, installing exhausts or mufflers on jackhammers or putting dampening materials or rubber linings on machines and tools. Worn bearings should be replaced. Vibration isolation pads may be installed under the legs of noisy equipment to reduce noise generated by the equipment vibrating on a concrete floor. When new machinery is purchased, the employer should make certain that it is quieter than old machinery. Improving or fixing exhaust mufflers and adjusting the engine to reduce vibration can reduce vehicle noise.
- ♦ **Isolate the worker or enclose the source of the noise:** In noisy vehicles, the holes and cracks in the operator's cab can be sealed with rubber or plastic and the cab can be insulated. Noisy computer printers may be enclosed with hinged, insulated covers that contain the noise generated.
- ♦ **Install sound-absorbing materials:** Acoustical materials may be installed on walls and ceilings to absorb sound waves and minimize reverberation. Examples include acoustic ceiling tiles and acoustic wall panels.

- ♦ **Increase the distance between the worker and noise-producing equipment:** By doubling the distance from the worker to the noise source, the noise levels may be reduced to one fourth the original levels. It is important to remember that this practice will not work in an enclosed room because of the tendency of sound to be reflected off walls, ceilings, and other flat surfaces.
- ♦ **Maintain machinery properly:** Tightening screws, oiling/greasing, and aligning machine parts can help reduce noise.
- ♦ **Administrative Controls:** Rotate workers so that the time each worker spends in a noisy area is limited.
- ♦ **Use personal protective equipment:** If engineering controls or the other actions listed above cannot reduce the noise to acceptable levels, ear muffs or ear plugs can be used. These should be used as a last resort. Hearing protectors, such as earplugs, often do not work well, are worn improperly, are uncomfortable, and can cause ear infections. Ear muffs are generally better than ear plugs since they reduce the most noise, are least likely to cause ear infections and they require the least personalized fitting. Earmuffs can be worn with earplugs to provide greater protection. However, earplugs and earmuffs should be used only as a last resort after all other measures to reduce noise have been tried. OSHA requires employers to provide training on the proper use of such equipment.
- ♦ **Measure noise levels:** Management and workers should monitor noise levels frequently in areas where noise seems to be high, to determine if safe levels are being exceeded or if there are any signs of Noise-Induced Hearing Loss. Monitoring is required under the OSHA standard where noise levels may exceed 85 dBA, and the union should be involved in choosing which areas to monitor.

Workers have a right to observe the monitoring and should make sure that the noise is measured where people actually work. They have a right to see the monitoring results.

- ♦ **Initiate a medical monitoring program:** Workers exposed to noise levels over 85 dBA should receive baseline-hearing tests when they begin work in a noisy area. Annual hearing checks can then be compared with the baseline to determine whether hearing loss has occurred. Such monitoring is required under the OSHA standard. Workers have a right to see the results of their exams.

For more information on the requirements of the OSHA standard 1910.95 please refer to the IBT Safety and Health Department Fact Sheet entitled *Hearing Conservation and Occupational Noise Exposure*.