

## Noise Exposure

**Introduction:** Most of us take hearing for granted. When we go home at the end of a workday and when we get up in the morning, we expect to hear. Our amazingly sensitive ears can distinguish 400,000 different sounds and can detect sounds so quiet that they cause the eardrum to vibrate less than 1/80,000,000 of an inch. But that remarkable sensitivity doesn't have a lifetime guarantee; in order to maintain hearing sensitivity, it must be protected. People differ in their sensitivity to noise, however, and there's no way to determine who is most at risk.

**Noise-induced hearing loss** is the term for hearing damaged by excessive noise. You should consider your hearing at risk if noise affects you in one of the following ways:

- **Have to shout** above noise to make yourself heard
- **Have difficulty** hearing normal sounds for several hours after exposure to noise.
- **Have ringing** in the ears for several hours after exposure to noise

**Is your workplace dangerously loud?** If you're not sure whether the noise in your workplace is dangerously loud, ask yourself: Is normal conversation difficult because of the noise? Have co-workers also complained about the noise? If so, protect your hearing with good quality ear plugs or earmuffs.

**85 decibels (dB)** - For all employers, including those in construction, OSHA requires a hearing conservation program for workers exposed to 85 dB or more averaged over the course of an eight hour work shift (time-weighted average or TWA). Eighty-five decibels over eight hours is considered the "action level" – the level at which the employer must take action.

If you are exposed to noise at or above an 8-hour average of 85 decibels, OSHA requires your employer to include annual training in a hearing conservation program. You need to be aware of the effects of noise on hearing, purpose and advantages of types of hearing protectors.

**The goal of the hearing conservation program** is to ensure that noise is monitored and that workers are getting hearing tests and are not overexposed to noise on the job. Annual audiometric testing is part of the program, which determines whether an employee's hearing is stable or getting worse over time.

**90 decibels (dB)** - When the eight-hour TWA reaches 90 dB, the permissible exposure limit (PEL), employees are considered overexposed, and employers must implement administrative and/or engineering and work practice controls to reduce exposure, and, hearing protection must be provided.

**Engineering Controls** – involve modifying or replacing equipment, or making related physical changes at the noise source or along the path to reduce the noise level. For example you can choose low-noise tools and machinery, maintain and lubricate machinery and equipment, place a barrier between the noise source and employee and enclose or isolate the noise source.

**Administrative Controls** – are changes that reduce or eliminate the exposure to noise like operating noisy machines when fewer people are exposed, limiting the amount of time a person spends at a noise source, providing quiet areas to gain relief from hazardous noise sources, and restricting worker presence a suitable distance away from noisy equipment.

### Hearing Protectors

**OSHA regulations regarding hearing protectors state:** *"Employers shall make hearing protectors available to all employees exposed to an 8 hour time-weighted average of 85 decibels or greater at no cost to the employees. Hearing protectors shall be replaced as necessary."*

- **Employers shall ensure** that hearing protectors are worn by any employee who is exposed to an 8-hour average of 85 decibels or greater.
- **Employees shall be given** the opportunity to select their hearing protectors from a variety of suitable hearing protectors provided by the employer.
- **The employer shall provide** training in the use and care of all hearing protectors provided to employees.
- **The employer shall ensure** proper initial fitting and supervise the correct use of all hearing protectors.

**Ear-plugs and Earmuffs** are the primary types of hearing protectors. Both decrease the pressure of sound that reaches the eardrum and are the next line of defense against noise when you can't reduce exposures to safe levels with administrative and/or engineering controls.

**Ear plugs** fit in the outer ear canal. To be effective, they must totally block the ear canal with an airtight seal. An improperly fitted, dirty, or worn-out ear-plug will not seal and can irritate the ear canal.

**Earmuffs** fit over the entire outer ear to form an airtight seal (they won't seal around eyeglasses or long hair) and are held firmly in place around the ear by an adjustable head band. In extremely noisy conditions, it may be necessary to wear both ear-plugs and earmuffs together.

**Properly fitted** ear plugs and earmuffs reduce noise levels 15 to 30 decibels. Decent quality ear-plugs and earmuffs are approximately equal in sound reduction, though earplugs are more effective for reducing low-frequency noise and earmuffs for reducing high-frequency noise.

**Conclusion:** How much noise one can withstand without damage to hearing depends on such factors as exposure, frequency of exposure, decibel levels, and type of noise. Remember that hearing protectors control noise, they don't eliminate it; they're effective only if you wear them the entire time you're exposed to hazardous noise. Follow these guidelines for hearing protection. With the reduction of even a few decibels the hazard to hearing is reduced, communication is improved, and noise-related annoyance is reduced.

**NOTICE:** *These guidelines do not supersede local, state, or federal regulations and must not be construed as a substitute for, or legal interpretation of, any OSHA regulations.*

