

# BULLETIN

Risk Control

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## HEARING CONSERVATION

Occupational noise exposure not only impacts the employees who have suffered or will suffer permanent hearing loss, as a result of exposure to unsafe levels of industrial noise, it also takes a huge bite out of the pocketbooks of employers who must financially compensate these workers.

According to the Third Edition of *Fundamentals of Industrial Hygiene*, published by the National Safety Council, an estimated 1.7 million workers in the U.S. between 50 and 59 years of age, have compensable noise-induced hearing loss. If only 10 percent of these workers file for compensation, and assuming that the average claim amounts to \$3,000, the potential cost to the industry could exceed \$500 million.



**Q:** When does hearing protection need to be worn?

**A:** The Cal/OSHA Control of Noise Exposure standard, Title 8 of the California Code of Regulations (CCR) Section 5095 et seq., does not alter the long-existing requirements that hearing protectors shall be provided and used to reduce sound levels to within a 90dBA time-weighted average (TWA) for an eight-hour day (specified in Table N-1), but it does add a number of additional conditions that trigger a hearing protector requirement.

- The employer shall make hearing protection available to all employees exposed to an eight-hour TWA of 85dB. 8 CCR 5098(a) (1).
- The employer shall ensure hearing protectors are worn by employees so if exposed, they have not yet had the baseline audiogram.
- Any annual audiogram shows a potential hearing loss.
- Employees are obligated to wear hearing protectors because of the long-existing 90dBA rule mentioned above. 8 CCR 5096.

**Q:** When should monitoring be done?

**A:** Under 8 CCR 5097(b), noise levels must be monitored when information indicates that any employee's exposure may equal or exceed an eight-hour TWA of 85dB. As a rule, if an individual's voice must be raised to converse at a distance of three feet, the noise level probably exceeds 85dB. At the very least, this is an indication that monitoring should be conducted.

**Q:** How should monitoring be done?

**A:** You can use either a sound level meter or an audio dosimeter. According to Cal/OSHA, sound level meters need to be Type 2 set on slow response on the A scale.

**Q:** What is the difference between a sound level meter and an audio dosimeter?

**A:** A sound level meter is an amplifying device that converts sound pressure waves into measurable units of decibels (up to 140dB). Sound level meters are used in basic and engineering surveys. A sound level meter is typically used for spot readings of equipment.

A dosimeter is essentially a two-in-one piece of equipment. It is a sound level meter that integrates noise samples over time, meaning the dosimeter averages several noise samples taken every second over a discreet period of time and sums up all of those averages to give a total represented as a dose percentage or TWA. A dosimeter is typically used for personal surveys.

**Q:** How is an employee's hearing evaluated?

**A:** The backbone of the employee evaluation is the audiometric test. An audiometric testing program is comprised of two types of tests, or audiograms: baseline and annual. Audiograms are used to document an employee's hearing level. The baseline audiogram must be conducted within six months of confirmation of an exposure equal to or exceeding the

85dB action level. It establishes a reference point to which future annual audiograms can be compared. The initial annual audiogram must be conducted within one year of the baseline. Subsequent audiograms must be performed yearly thereafter.

By comparing the annual audiogram to the baseline audiogram, an employer can evaluate whether an employee has experienced any recordable hearing loss during this window of employment. This hearing loss is referred to in the OSHA standard as a **standard threshold shift (STS)**. Cal/OSHA defines an STS as, "a change in hearing threshold relative to the baseline audiogram of an average of 10dB or more at 2000, 3000, and 4000 Hz in either ear" (8 CCR 5097).

Should the audiogram results indicate an STS has occurred, Cal/OSHA requires that the affected employee be fitted (or refitted) with hearing protectors, trained on the proper use of them and required to wear them. The employee must be informed of the STS and may be referred for further audiometric testing.

When it comes to audiometric testing, Cal/OSHA is quite specific in terms of who can administer the test and the type of equipment that must be used. Basically, Cal/OSHA requires a licensed or certified audiologist or a technician who is certified by the Council of Accreditation in Occupational Hearing Conservation.

**Q:** What is a Noise Reduction Rating (NRR)?

**A:** Noise Reduction Rating (NRR) is defined as the maximum number of decibels (dB) the sound level will be reduced when the hearing protector is worn.

**Q:** Can earmuffs and earplugs be used together to provide more noise reduction?

**A:** Yes. Cal/OSHA allows earplugs to be worn in conjunction with earmuffs. The resulting NRR this produces is calculated by adding 5dB to the NRR of whichever protector (the earplug or the earmuff) has the higher NRR. Keep in mind that this is after the necessary reduction factor of 7dB (if using the A weighted scale) has been calculated. For example, if you were using earplugs with a NRR of 32dB along with earmuffs with a 27dB NRR, your noise reduction calculations would be:

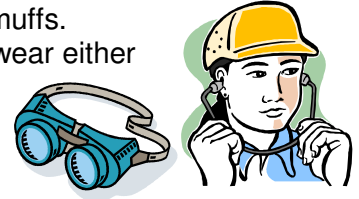
- 32dB [A] (earplugs) – 7dB (OSHA Safety Factor) = 25dB
- 25 dB + 5 dB (for using earmuffs and earplugs together) = 30dB

- Total corrected NRR = 30dB

**Q:** Can earmuffs be worn in conjunction with safety glasses?

**A:** Earmuffs require a perfect seal around the ear. Glasses, facial hair, long hair, or facial movements such as chewing may reduce the protective value of earmuffs.

Therefore, it is best to wear either earplugs or a hearing band if safety glasses or prescription glasses need to be worn.



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