



A DIVISION OF WESCO DISTRIBUTION, INC.

## Hearing Protection Ready Reference

Updated 10/2018

1. [The Law](#)
2. [The Essentials](#)
3. [Don't Forget](#)

### 1. The Law

#### **A. 1910.95 (General Industry) and 1926.101 (Construction)**

#### **B. OSHA Compliance Review**

- After [administrative and engineering controls](#) have been considered for a noise problem, Hearing Protection Devices (HPDs) must be worn once a 90 dB TWA (time weighted average) is reached.
- Most safety professionals understand that an 85 dB TWA (or action level) is a much safer level to require hearing protection. The 85 dB action level is when all workplaces are required to implement a Hearing Conservation Program to evaluate and monitor potentially excessive noise concerns in a given workplace.

A Hearing Conservation Program (at 85 dB) consists of:

- Specialized noise monitoring
- Employee notification
- Audiometric testing program
- Hearing protectors made available
- Training program
- Recordkeeping

#### **C. [An OSHA Letter of Interpretation indicates that employers must offer workers a selection of hearing protection](#)**

- This implies at least one type of earplug and one type of earmuff. However, multiple earplugs should be available to accommodate workers with varying sizes and shapes of ear canals.

### 2. The Essentials

#### **A. What Type of Hearing Protection Device is Best for Me?**

- The best hearing protector is the one that gets worn.
- Taking off your hearing protector in noisy environments for as little as 5 minutes a day can dramatically affect your true noise reduction rating (NRR).

- Don't automatically assume it is best to pick a product based on the highest NRR. Pick a product that best matches your noise levels.
- Overprotection can lead to employees pulling off their hearing protection at inappropriate times. Overprotection of employees can create a feeling of isolation and might prevent workers from hearing important sounds (intercom, alarms forklift traffic, etc.).

## B. What is a Decibel?

- The decibel (dB) utilizes a logarithmic radio-type scale to describe various sound levels
- A source that emits sound waves produces tiny changes in air pressure
- The human ear can hear sound over a wide range of pressures, with the ratio of highest to lowest pressures about 10 million to 1
- 0 dB is the threshold of hearing, 130 dB is the threshold of pain
- If the sound pressure is doubled, it increases by about 5 dB (also referred to as the exchange rate)
- The human ear often interprets a 10 dB increase as twice as loud (or a 10 dB decrease as half as loud)

## C. What Are the Different Types of Hearing Protection?

**Disposable Earplugs** provide comfortable hearing protection at a reasonable cost. Plugs have high NRRs and form a tight seal for a variety of ear canal sizes.

- Made of either PVC ([EAR Classic Foam Earplugs](#)), polyurethane ([Max Earplugs](#) or Direct Safety Safe Soundz), thermoplastic elastomer foam ([Matrix Earplugs](#)), thermal reactive foam ([EAR Push-Ins with Grip Rings](#)), or Latex Free Silicone (Direct Safety Flangez)
- Corded plugs are easier to identify, last longer, and offer less chance of contamination
- NRR can be affected if the plug isn't inserted properly
- Employees may need to try several sizes and shapes to get the best fit for their ear canal
- Some disposables do not have to be rolled to put into ear canal

**Reusable Earplugs** provide long-term cost savings over disposable plugs. Plugs require no rolling before inserting.

- Better cost savings for customers, as they can be washed and reused
- Generally not as comfortable as most disposable plugs
- Most styles rely on flanges to block sound out
- NRR rating normally less than disposables
- Corded plugs are easier to identify, last longer, and offer less chance of contamination

**Push-Ins or Reusable/Disposable Hybrids** are typically made of the same foam material used in disposable plugs. EAR Push-Ins and Push-Ins w/grip rings are made of new thermal reactive foam, soft, and comfortable because it reacts to the user's body heat. You don't touch the end of the plug with your fingers, so they last longer.

- You don't have to roll to insert, just push in
- Perfect for workers with dirty hands
- Quick and comfortable protection with good NRR ratings
- Available as the EAR Express Pods, EAR Push-Ins, Howard Leight Quiet, and AO No-Touch

**Metal Detectable Plugs** can be detected by a metal detector when dropped into a food processing line.

- Always colored blue, as this stands out as a non-edible food color
- Available in both disposable and reusable styles
- Only available in corded styles

**Hearing Bands** are designed for fast access and easy insertion by employees who are frequently in-and-out of noisy areas.

- Normally only used for short-term use, as the pressure on sides of head can become uncomfortable
- NRR ratings lower than all other categories

- Level of protection primarily depends on shape of the pod. It may enter the ear canal (more protection) or simply cover the opening of the ear canal as a “cap” (less protection, but more comfortable).

**Earmuffs** are comfortable protection that employees can wear all day long. Muffs can be used in conjunction with certain earplugs for even higher protection levels.

- Holds NRR level better than other hearing protection, as it’s difficult to improperly place the protection on your head
- Thin frame temple bars of safety/prescription glasses will reduce NRR up to 2 dB
- Thicker frame temple bars can reduce NRR up to 5 dB (a comfort issue also)
- Hair can interfere with proper seal of earmuff
- Earplugs worn with earmuffs will gain approximately 5 NRR to the earmuff rating

**Dielectric Earmuffs** have no metal parts on product to conduct electricity.

**Single Point Earmuffs** have only one point of pressure on each side of the cup and a headband that swivels easily to three positions on the head (top, behind head, and under chin). This allows wearer to use a hardhat, bump cap, or even a baseball cap.

**Dual Point Earmuffs** have 2 points of pressure on each side of the head and can only be used with headband directly over the top of head. This style will generally give more even pressure to the cup for better noise reduction.

**Electronic Earmuffs** amplify speech communication, while keeping out harmful noise. Units may feature an AM/FM radio or have the ability to connect to a 2-way radio for workplace communication.

**Music AM/FM Radio Muffs** normally have a maximum output of 82 dB. This helps prevent hearing damage by playing music too loud, yet you still receive protection from the external noise, some are now Bluetooth compatible.

## D. What is an NRR?

- NRR (Noise Reduction Rating) is a rating system set up by the Environmental Protection Agency as a guideline that indicates the amount of potential protection a hearing protection device will give in a noisy environment. [Example of current NRR label.](#)
- Even though a higher NRR is intended to indicate a greater noise reduction capability, the reduction obtained in actual use is affected by the protector size, fit, and style as well as the user motivation and training.
- Individuals have different sized ear canals which also affect the NRR.
- The reduction actually achieved may be substantially less than the labeled NRR.
- A realistic estimate of actual noise reduction can be obtained by reducing the labeled NRR using two formulas (1)  $NRR \times 50\%$  (2)  $(NRR-7) \times 50\%$ . This process is discussed by OSHA under Appendix B of 1910.95: [hearing protector attenuation.](#)
- Earplugs worn with earmuffs will add about 5 NRR to the earmuff rating.
- Prescription or safety glasses used with earmuffs can reduce the effective NRR by as much as 5 dB (depending on the thickness of the temple bars).

## E. What Are The Factors in Hearing Loss?

- Total energy of the sound (dB)
- Total daily time of the sound
- Length of employment in the noisy environment
- Variation in individual susceptibility (age or health)
- Frequency distribution of the sound (which way it is pointed)
- Whether noise is continuous, intermittent, or made up of a series of impacts
- [Hearing protection for the hearing impaired](#)

## **F. What Type of Testing Equipment is Available?**

### **Sound Level Meters**

- Give instantaneous noise reading levels from 0-130 dB
- Only ANSI compliant models can be used for OSHA documenting of noise readings
- Must purchase a calibrator to periodically document operation of unit
- The reason the cheapest unit is not ANSI compliant is the accuracy of the unit

### **Noise Dosimeters**

- Can be attached to a worker to get a true noise reading of worker throughout the work shift and calculate it automatically for a proper time weighted average (TWA)
- Have the ability to download to a computer
- Can also be used as a handheld sound level meter
- Must purchase a calibrator to periodically document operation of unit

## **3. Product Reference**

- A. Earplug Dispensers – We have reusable and disposable dispensers
- B. Hearing Protection Signs – Required for areas where hearing protection is required
- C. Hygiene Kits – For earmuffs
- D. Replacement Pods – For hearing bands
- E. Hearing Protection Training (through Safety Services or Online Training available)
- F. 2-Way Radio Communication or Electronic Earmuff
- G. Sound Level Meters and Noise Dosimeters

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