

## Noise and Hearing Loss

Noise-induced hearing loss (NIHL) is the only preventable type of hearing loss. It results from exposure to loud noises over time (such as frequently wearing earbuds with the volume up) or from a single exposure to extremely loud noise (like an explosion).

Sound is measured in decibels (dB) which is a logarithmic scale. If the sound intensity at 60dB were 1, 70dB would have a sound intensity of 10 and 80dB a sound intensity of 100. Sounds below 75dB are unlikely to cause hearing loss. Long or repeated exposure to sounds above 85dB can damage hearing. The louder the sound the less time it takes for damage to occur.

Most people are unaware of the presence of noises in their environment which can damage their hearing. Common sources of damaging noises include:

- car stereos (normal car stereo at loudest level is about 100dB),
- children's toys (some are over 100dB),
- heavy traffic (85dB)
- lawn and maintenance equipment (around 95dB)
- power tools (typically 90-110dB)
- gunshots (140-190dB)
- hair dryers (on highest setting, 80-100dB)

The distance you are from a noise and length of time you are exposed to the noise will impact the effect on your hearing. Avoid noises that are too loud, too close, or last for a long time. If these cannot be avoided, wear hearing protection while exposed to the noise.

## Supervisor Responsibilities

Supervisors are responsible for ensuring their employees have appropriate hearing protection for their jobs and that all employees know how and when to use their hearing protection.

Contact EH&S to determine if your employees require hearing protection, and if so the level of protection needed.

### Three Steps to Effective Hearing Protection

1. **Selection:** Offer a variety of hearing protectors appropriate for the job(s). Consider the noise level, work environment, wearer's convenience, communication needs, and any preexisting hearing loss.
2. **Train, Train, Train:** Don't just tell your employees how to wear the HPDs – have the wearer demonstrate correct placement of the device. Make sure employees know what a good fit feels and sounds like. Reinforce the need to use HPDs at all times in noisy environments. Teach the wearer how to care for their HPDs and how to recognize when they need to be replaced.
3. **Fit the Individual:** Check the fit in each ear to make sure the device is a good match to the individual's anatomy. Make sure the fit is comfortable, that is the key to user acceptance.

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# HEARING PROTECTION



Environmental Health and Safety



**Contact EH&S for noise monitoring to determine the proper type of hearing protection for your noise exposure.**

## Hearing Protection Devices

Hearing Protection Devices (HPDs) are one component of an effective hearing conservation program. HPDs, when used properly, will protect the delicate hearing system from the effects of loud noises both on and off the job.

HPDs come in various shapes, sizes, and protection levels. While there is an HPD to suit nearly every person and situation, no single HPD is right for every job, person, and noise environment.



Each person must be individually evaluated to determine the best HPD for their environment, noise exposure, anatomy, and hearing ability. HPD choice must take into account on-the-job communication needs and the way the HPD could interact with other safety equipment.

Keep in mind that the object is to have a HPD that creates a good and comfortable seal against noise. Noise leaks caused by improper use or fit will compromise the protection offered by the HPD.

**The best HPD is the one that will be used consistently and properly every time it is needed.**

## Checking HPD Fit

### The Tug Test

Very gently tug back and forth on the handle of the earplug. If there is resistance and if you feel a sensation of gentle suction on the eardrum, then the earplug has probably achieved a seal. However, if the plug pulls out easily, an adequate seal was not achieved and the earplug(s) should be removed and reinserted.

### The Hum Test

After inserting just one earplug, hum or say “ahhh”. If the ear is properly sealed, then the sound of your voice will seem louder in the sealed ear. If the sound is not louder in the plugged ear, then the ear canal is probably not adequately sealed. Having both ears sealed will cause your voice to be perceived equally in both ears, or in the center of your head.

### The Loudness Test

While in a noisy environment, with plugs inserted in both ears, cup both hands over your ears. If the noise level goes down with your hands over your ears the HPDs are not properly inserted. The HPDs should block enough noise that there is no difference in sound with or without hands over your ears.

Alternatively, you can break the seal of each earplug, or raise each cup on an earmuff, and the sound should increase significantly.

## Formable Insert Plugs

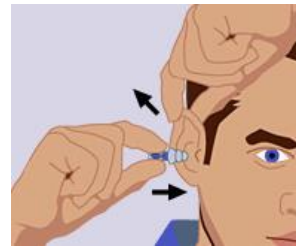


Most popular varieties are made from expandable, slow-recovery foam.

Before fitting ear plugs or semi-insert HPDs, examine the ear canals to determine whether any obvious indication of possible medical problems are present. Also check for excess ear wax that might be pushed further into the canal during insertion of an earplug. If these conditions exist, then earmuffs should be worn until the problem is corrected.

**To Use:** Slowly roll and compress plugs into a very thin cylinder and insert well into the ear canal.

Fitting is easier if you reach around the head to pull the ear outward and upward during insertion.



**The Good:** Properly inserted, foam plugs offer among the best protection available and yet are found to be very comfortable for most wearers.

**The Bad:** Some manual dexterity is required to roll and insert the plugs, they are subject to contamination in dirty environments and they are generally treated as limited-use or “throw away” products.

## Pre-Molded Plugs

These are typically molded from soft plastic which is preformed to fit the ear. Reach around the back of the head and pull outward and upward on the ear while inserting these plugs.

**The Good:** Pre-molded plugs are relatively easy to insert and are reusable.

**The Bad:** Although some of the newer versions are one-size products, most are sold in two or more sizes and must be individually sized for each ear. They can work loose while wearing and require resealing.

## Custom Molded Plugs

Individual impressions are made of each ear canal using a quick-curing material. For some products, the impressions themselves are coated and sealed to become reusable earplugs. For others, the impressions are sent to a lab to make custom ear molds.

**The Good:** Some employees like the individual attention of having their own earplugs molded and fit, and for some custom ear molds are especially comfortable.

**The Bad:** Custom plugs are expensive, especially when the employee time is considered as a cost. Slight and normal changes in ear canal size may require taking new impressions.



## Semi-Insert/Canal Caps

These consist of a lightweight band with soft rounded or conical pods or flexible tips that seal at or near the entrance of the ear canal.



**The Good:** They can be useful for intermittent exposures because they are quick to put on and take off and easy to hang around the neck when not in use.

**The Bad:** They generally provide less protection than either plugs or muffs and aren't usually recommended for continuous long-term use because of discomfort.

## Earmuffs

These consist of rigid cups with soft plastic cushions that fit around the outer ear and against the head. The muffs must fully enclose and seal around the ears to properly block noise.

**The Good:** Earmuffs are easy to use and fit, and to put on and take off. They require less training in use and provide consistent protection in most cases.

**The Bad:** Safety glasses, long hair, and beards may interfere with a good seal, or the muffs themselves may interfere with other safety equipment like helmets and hoods. In addition, they may feel hot or heavy with long periods of use. If gaps are present, earmuffs can actually increase the level of noise reaching the eardrum.