

EMPLOYEE TRAINING/ STAFF SIGN-IN SHEET

TOPIC: Hearing Protection  
 PRESENTER: John Borland  
 DATE: July 31, 2014  
 TIME: 7:10 am

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# Hearing Protection

## Earmuffs

### "What did you say?"

Let me get my earmuffs on, so I can hear you." This remark may seem strange if you're not in the habit of wearing hearing protection. But in a noisy workplace where you have to strain to hear someone two feet away, hearing protection is not only necessary to protect your hearing, it can also help you hear the sounds you want to hear. Earmuffs and other protective devices enable you to pick out sounds from a background of noise in much the same way that sunglasses help you see objects in glaring sunlight.

### Earmuffs— Who Needs Them?

If your employer has made earmuffs or earplugs available to you, the usual noise level in your workplace probably exceeds 85 decibels—and that's loud enough to damage your hearing over time. When there is a choice of hearing protectors, the choice you make depends on several factors, such as comfort, loudness of noise, and whether the noise is consistently loud. Earmuffs are easier to put on and take off than earplugs, and so are the best choice if you do need them all the time. However they are bulky and relatively expensive, and may not fit well with other protective equipment such as hard hats, respirators and eyeglasses. If you work in a very noisy environment, you may need to use earmuffs and earplugs together for added protection.


### The Typical Earmuff

Earmuffs consist of cushioned cups attached to a headband that may be worn over the head, behind the neck or under the chin. Cups are made of molded plastic and filled with foam or similar material. They should adjust up and down, in and out, for a good fit. Cushions filled with foam, liquid or air cover the cups and completely seal

them around the ears. Specialized models are available: cap-mounted earmuffs can be attached to safety hats; dielectric earmuffs (for workers exposed to high voltage) do not have metal parts; and electronic earmuffs reduce hazardous noises while magnifying sounds you need to hear. Earmuffs reduce noise about 20 to 30 decibels; the Noise Reduction Rating (NRR) on your earmuffs indicates their effectiveness.

### Effectiveness Depends on Fit

Your earmuffs should fit comfortably, the headband neither too tight nor too slack. To work right, earmuffs must form a seal around the ears, completely enclosing them, without pinching the earlobes. No hair or clothing should stick out from under the cups. Your eyeglasses may need to be modified to fit with earmuffs. Follow manufacturer's instructions for cleaning and storage, and replace hardened, cracked or worn cushions.

When properly used, alone or in combination with earplugs, earmuffs can be an effective way to protect your hearing. For the best protection, have your hearing tested at least once a year and compared to previous tests, understand the effects of noise on your hearing, and wear your earmuffs whenever your job requires them. 





# Hearing Protection

## Earplugs

Does your company provide you with earplugs or other hearing protection? If so, you may be wondering if they are necessary or if you will be able to communicate when wearing them. The good news is that earplugs do not lessen your ability to hear your co-workers; if you need earplugs, your workplace is so noisy you can't hear them anyway. And earplugs can screen out background noise (in much the same way that sunglasses screen out background glare), actually making it easier for you to hear sounds such as the human voice.

### TYPES OF EARPLUGS

There are three general categories of earplugs:

1. Formable earplugs, made of waxed cotton or acoustical fibers, can be molded to fit your own ears. They are disposable. Semidisposable plugs of molded foam are used for up to a week.
2. Premolded inserts of soft silicone rubber or plastic are reusable; some come in different sizes.
3. Custom-molded earplugs are molded to fit the individual; silicone rubber or plastic molding compound is placed in each ear and allowed to set. The set compound may be used as earplugs or as molds for ear-plugs.

### Effectiveness

Earplugs may reduce noise levels by up to 30 decibels. That is, if the noise in your environment is 100 decibels, your earplugs could effectively reduce it to 70 decibels. When choosing earplugs, check the Noise Reduction Rating (NRR) on the package. The higher the number, the better the protection.

### Fit and Maintenance

To work properly, earplugs must completely fill the ear canal. When inserting earplugs, grasp your ear from behind your head with your opposite hand, and pull up to straighten the ear canal. Insert the earplug until it blocks sound; then hold it in place for a moment while it expands. Make sure your hands are clean when inserting plugs, and keep reusable plugs clean by washing them after each use in warm soapy water, to avoid ear infection.

Properly fitting earplugs need not interfere with your comfort or ability to hear important sounds. And they can protect you from gradual loss of hearing that you may not notice until permanent damage has occurred. By knowing what noise levels require hearing protection, getting your hearing tested at least once a year, and taking responsibility for using hearing protection, you are making a "sound" investment for your future.



To insert an earplug properly, grasp your ear from behind your head with your opposite hand and pull up to straighten the ear canal. Insert the earplug until it blocks the sound, then hold it in place for a moment while it expands. To prevent ear infections, wash your hands first.

### Who Needs Earplugs?



If you have to shout to be heard by someone standing three feet away, the noise level is probably more than 85 decibels. Continuous exposure to this level of noise can cause hearing loss.

If you have to shout to be heard by someone standing three feet away, you are in an environment with over 85 decibels of noise—a level that, if it continues over the eight hours of your

workday, will eventually damage unprotected ears. Your choice of earplugs, earmuffs or canal caps should be based on comfort, noise intensity and duration, and company policy. Earplugs have the advantage of being lightweight, inexpensive and, if disposable, low-maintenance. They are the protectors of choice for work in hot, enclosed environments or in situations where you keep hearing protectors on all day. They may be easily worn under hard hats and other head protection, as well as with eyeglasses. Because earplugs are difficult to remove and put in properly, and some must be thrown away when removed, they are a less desirable choice if you are wearing hearing protection only part of the time. Canal caps, another option, are like earplugs on a headband: the headband holds the caps tightly in the opening of the ear canal. They are lighter than earmuffs and easier to get on and off than earplugs. ☑



# Hearing Protection

## How Hearing Works

Are you one of the 20 million people who are exposed to hazardous noise on the job? If so, you'll want to protect yourself from hearing loss by learning how hearing works, how your own hearing is measured, and how high levels of noise can cause hearing loss over time.

### How the Ear Hears

Sound waves travel through the ear canal to the eardrum. This membrane vibrates when the sound waves hit it, much the same way a drum vibrates when you hit it. The vibrations are transferred through tiny, sensitive bones in the middle ear to the cochlea, a coiled, hollow structure in the inner ear that is filled with fluid and lined inside with thousands of tiny hairlike structures called hair cells. When the sound vibrations transfer to the cochlea, they cause waves in the fluid to move the hair cells, which convert the vibrations into nerve impulses. The auditory nerve carries these impulses to the brain, where you interpret them as sound.

### How Damage Occurs

The hair cells lining the cochlea of your ear are extremely fragile. They can be damaged by such things as infections, head injuries, and certain drugs. But the most common source of damage to hair cells is noise. Loud noise over a period of time causes these nerve cells to die off, usually so gradually that you are not aware that it's happening until your hearing is permanently damaged.

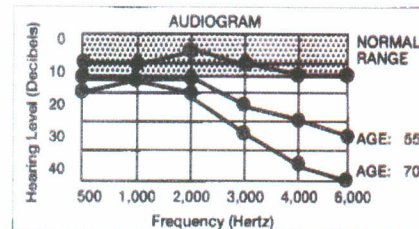
### Audiometric Tests

Fortunately, we can measure hearing loss with a sensitive test that will keep track of your hearing ability and alert you and your company to hearing loss, long before it becomes severe



enough to affect you. In this test, which measures your ability to hear sounds of different frequencies (itches), you will be asked to listen to sounds and indicate when you hear them. The results are shown on an audiogram, a graph that shows your hearing threshold (the quietest sound you can hear) at each frequency. The frequency of sound is shown on the horizontal line of the graph and is measured in units called *hertz*; the higher the number, the higher the pitch. The vertical line on the left shows the loudness of sound at your hearing threshold; it is measured in units called *decibels* (sometimes abbreviated *dbA*). The jagged line in the audiogram connects your hearing thresholds at different frequencies; the higher the line, the better your hearing.

This audiogram shows how hearing changes as we age: At lower pitches there isn't much difference, but as we get older we experience greater difficulty in hearing high



itches. The same changes take place when there is hearing loss from excessive noise. If you compare audiograms taken at one-year intervals and find that the line has dipped significantly, you are experiencing hearing loss, even though you may not yet notice it.

### What Does "Too Loud" Mean?

Decibels, used for measuring hearing thresholds, are also used for measuring the loudness of noise. You are exposed to about 20 decibels in a quiet bedroom, 110 decibels when you are using a power saw. OSHA regulations require hearing protection to be made available if you are exposed to noise levels above 85 decibels for eight hours at a time. Always wear hearing protection when the noise level is over 90 decibels. You can tell you need hearing protection if you have trouble hearing someone talking two feet away, if you hear ringing or other sounds in your ears after you leave work, or if you have trouble hearing for a while after you leave work.

In spite of what you may have been told, you don't "get used to" noise. You may learn to ignore it, but your ears can't tune it out. You can help protect your precious hearing by wearing proper hearing protection, having your hearing tested yearly and compared to previous tests, and giving your ears a rest by getting away from noise whenever you can.