

RESHOLD LEVEL

# The THRESHOLD

A T K GROUP PUBLICATION DEVOTED TO OCCUPATIONAL HEARING LOSS PREVENTION AND PROGRAM MANAGEMENT

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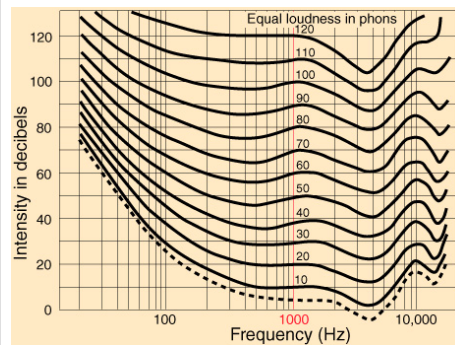
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## The Recordable Hearing Loss Event Criteria

Many people call T K Group to gain clarification on just what a potentially OSHA Recordable hearing loss event is. Much confusion centers around OSHA's definition of a Recordable event as stated on CFR 1904-Recording and Reporting Occupational Injuries and Illnesses. OSHA defines the event as "An 10 dB Standard Threshold Shift (STS) with a 25 dB or greater departure from audiometric zero". The majority of confusion centers around the phrase "audiometric zero".

The term "audiometric zero" refers to a curve developed years ago in a study using young healthy ears. Test participants were given a hearing test at all test frequencies. All points on the curve shown below represent a sound pressure level at which test tones were just barely audible.



The "dotted" line on the bottom of the above graph represents sound pressure levels at which (averaged) audiometric thresholds were obtained at all test frequencies. For ease and simplicity, each sound pressure level at each test frequency was later converted to a decibel scheme called dBHL (Hearing Level), thus 0 dB HL is "audiometric zero".

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# The Recordable Hearing Loss Event Criteria

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When looking at an employee’s test data to determine a Recordable event is applicable, forget the term “audiometric zero” and determine the following:

1. Is there an age corrected 10 dB STS as compared to the baseline test or revised baseline test (if applicable)?
2. If yes, add up the threshold values on the shifting ear(s) on the current test and divide by three. If the average equals or is greater than 25, the Recordable criterion is met.

1/1/11	15	10	30	40	50	20	15	STS L	5	15	10	15	10	15	10
1/1/10	10	10	5	10	10	10	15		5	10	10	10	10	15	15
1/1/09	10	10	10	5	10	15	10		0	5	5	10	10	10	15
1/1/08	0	5	10	10	5	10	10		0	10	10	5	10	10	15

**30+40+50=120; 120/3=40**

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## Selecting Hearing Protectors To Fit Ear Canal Size

When selecting hearing protectors, specifically ear plugs or canal caps, an individual's ear canal size should be closely examined.

The ear canal (External Auditory Canal) varies in size among humans. The canal is typically 35 mm long and 5-10 mm in diameter. Smaller or larger variations occur.

When selecting appropriately sized protectors for persons with small canals, be sure that the chosen protector is not too large; this will make for a very uncomfortable fit, cause irritation, and make for a greater probability of the plug becoming dislodged frequently. Albeit rare, a congenital condition called Aural Atresia results in a nearly closed opening to the ear canal and in some cases the condition cannot be surgically corrected. Such individuals are not candidates for ear plugs; ear muffs are the appropriate alternative.

When selecting a protector for large canals, obviously select a protector large enough to form and maintain a tight seal. You may occasionally see individuals with an abnormally large ear canal due to surgery; applicable individuals are not candidates for plugs and ear muffs are the only alternative.

Once a hearing protector is selected, it is very important that you observe the individual making insertion of the device into the ear canal. Appropriate

insertion is actually a skill requiring a fair amount of practice. A common mistake made during insertion is failing to roll the ear plug down small enough to allow it to insert sufficiently deep enough into the canal. If the ear plug is not rolled down sufficiently, a loose fit can result thereby lowering the device's effectiveness.

Another common mistake is failing to apply pressure to the plug long enough for it to expand and mold properly to the anatomy of the canal.

Proper selection and insertion of any hearing protector device is critical because research indicates that labelled Noise Reduction Ratings (NRRs) overestimate "real world" attenuation.

Effective training and motivation, especially, for new and young employees, is critical to ensure device effectiveness. Effectiveness can be compromised due to physical movements (i.e. talking or chewing). After the device has been inserted, direct the employee to talk and simulate chewing and visually inspect the insertion to assure that the seal is being maintained.

Noise induced hearing loss is 99% preventable by selecting hearing protector devices that fit appropriately and provide adequate attenuation.

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