

Summary of Part 380 Occupational Noise Exposure

What are the health effects of noise?

The human ear consists of three main parts: the outer ear, middle ear and inner ear. The outer ear collects sound waves that vibrate the eardrum. This vibration affects the middle ear's three small interlocking bones: the hammer, anvil and stirrup. Sound vibrations are transmitted to the inner ear, where they disturb the fluid of the cochlea, a snail-shaped tunnel containing thousands of tiny hair-like cells. These cells transform the motion of the disturbed fluid into electrical nerve impulses that are transmitted to the brain.

Occupational hearing loss is a slow degeneration of the hair cells of the inner ear that results from excessive noise exposure. The hair cells that degenerate first cause hearing loss at higher frequencies, which are associated with human speech consonants. Eventually, even the more protected hair cells may degenerate resulting in hearing loss in all frequencies.

How do we measure noise?

Noise is measured with a sound level meter, an instrument capable of converting sound pressure levels into electrical signals given as decibels (dB). A noise dosimeter is a sound level meter that integrates noise over time to produce a time-weighted average.

Performing noise exposure monitoring requires a sound level meter or dosimeter set in the "A" scale at "slow" response. The "A" scale weights the intensity of the sound frequency similar to the human ear's response to hearing.

What are the main requirements of the Occupational Noise Exposure standard?

The MIOSHA occupational noise exposure standard (Rules R 325.60101 through R 325.60128) contains requirements for implementing a Hearing Conservation Program when employees' exposures are at or above the "action level" (AL) of 85 dBA. This limit is expressed as an eight-hour time-weighted average (TWA₈).

When employee exposures exceed the "permissible noise exposure limit" (PNEL) of 90 dBA TWA₈, the employer must implement feasible administrative (i.e. work practice, employee rotation) and/or engineering controls to reduce the exposures to less than 90 dBA TWA₈. Engineering controls are defined as any modification or replacements of equipment or related physical change at the noise source or along the transmission path (with the exception of hearing protectors) that reduces the noise level.

What is a "hearing conservation program" (HCP)?

A hearing conservation program is a program established by an employer which includes provisions for measuring employees' noise exposures, conducting audiometric tests, providing and using hearing protectors, conducting training and maintaining records.

Are employers required to monitor employees' noise exposures?

Employers are required to establish a system of monitoring that evaluates employees' noise exposure sufficiently to determine which employees are to be included in a hearing conservation program. It is necessary to repeat exposure monitoring when a change in the workplace results in increased exposure or an increase in the number of employees exposed. Records of noise exposure monitoring must be kept for at least two years.

What role do employees have when noise exposure assessments are conducted?

When noise exposure monitoring is conducted, the employer must provide affected employees or their representatives an opportunity to observe the monitoring.

Does an employee have the right to know the results of his or her noise exposure assessments?

An employer must notify an employee when his or her exposure is at or above the action level, 85 dBA TWA₈. The notice must include the noise exposure determination and the corrective action being taken by the employer (i.e. hearing conservation programming and possibly hearing protection use requirements).

What are the requirements for audiometric tests?

Audiometric tests must be administered to all employees who are enrolled in a hearing conservation program. Audiometric tests are required to determine if occupational hearing loss has occurred. A "***baseline audiogram***" must be obtained within 6 months of enrollment in a hearing conservation program. If a mobile test van is used, the baseline test may be conducted within 12 months. After establishing the employee's baseline audiogram, an "***annual audiogram***" must be obtained as long as the employee remains in the hearing conservation program. The employer is required to notify the employees in writing of the results their audiometric tests.

By comparing baseline and annual audiograms, threshold shifts are discovered and the beginning of hearing loss is detected. The purpose of audiometric testing is to trigger prompt protective measures. Audiometric test records must be maintained for the duration of the affected employee's employment.

What is required if an employee's annual audiogram shows hearing loss?

The term "standard threshold shift" (STS) describes an average change in hearing of 10 dB or more from the baseline audiogram for the frequencies of 2000, 3000 and 4000 Hz in either ear. If an STS is found, the employer must provide follow-up procedures that include evaluating the adequacy of hearing protectors, refitting, and retraining on their use and care. In addition, a referral for a clinical evaluation must be made if it is suspected that a medical pathology of the ear

exists. The affected employee must be informed in writing of test results within 21 days of the determination of the STS.

When are employees required to wear hearing protectors?

Employers must provide and ensure that hearing protectors are worn by all employees whose exposure exceeds the PNEL (90 dBA TWA₈). When employees are exposed at or above the AL (85 dBA TWA₈) and less than the PNEL, hearing protectors are also required if the employee has incurred a standard threshold shift (STS), or when more than 6 months passes and the employee has not received a baseline audiogram.

What types of hearing protectors must be provided?

When hearing protectors are required, the employer must allow the worker to choose from several types of protectors (i.e. muffs and two types of plugs). The employer must ensure that the hearing protector is in good condition and is fitted and maintained in accordance with the manufacturer's instructions. Hearing protectors must be provided at no cost to the employee.

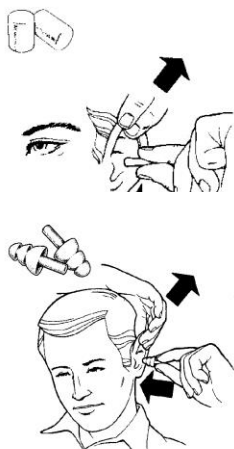
Dual hearing protections, plugs worn underneath muffs, are required whenever a single protector is inadequate to reduce the exposure to less than the PNEL. If the employee has incurred a standard threshold shift (STS), hearing protectors must attenuate sound exposure to below 85 dBA.

What type of information and training is required by the rule?

The employer must provide employees with training on the effects of noise on hearing; the purpose and value of wearing hearing protectors; instructions on the selection, proper fitting, use, and care of hearing protectors; the purpose of audiometric testing; and an explanation of the test procedures. Written documentation of employee training on noise and hearing protection requirements must be kept for all employees enrolled in the hearing conservation program.

A copy of the MIOSHA Occupational Noise Exposure Standard must be available to the affected employees or their representatives, and a copy must also be posted in the workplace.

The following graphics are included to provide assistance in demonstrating proper hearing protection use. Hearing protection devices come in different sizes and employees may need to try different sizes or types of hearing protection to find the best fit.



Formable Plugs - Slowly roll and compress foam plugs into a very thin cylinder. While compressed, insert plug well into the ear canal. Fitting is easier if you reach around the head to pull the ear outward and upward during insertion.

Premolded Plugs - Reach around the back of your head and pull outward and upward on the ear while inserting the plug until you feel it sealing; tight at first, especially if you've never worn earplugs.



Earmuffs – Muffs must fully enclose the ears to seal against the head. Adjust the headband so cushions exert even pressure around the ears to get the best noise reduction. Pull hair back and out from beneath the cushions. Don't store pencils or wear caps under the cushions.

Courtesy of **BEAR**

What are the requirements for reporting STS as an illness?

Rule 1115 of Part 11 *Recording and Reporting of Occupational Injuries and Illnesses* requires employers to record a work-related STS under Column five on the MIOSHA 300 Log if the employee's total hearing is 25 dB or more above audiometric zero (averaged at 2000, 3000, and 4000 Hz) in the same ear as the STS. What follows is an example protocol for determining if an STS is to be recorded. If at any step a "no" is encountered, the process ends and the hearing change is not recorded on the Form 300.

Step 1: Compare the original baseline audiogram or last audiogram showing a recordable shift in hearing; is there an STS in either ear (age adjustments allowed)? If yes continue to Step 2.

Step 2: Is the average hearing loss on the current hearing test at 2000, 3000, and 4000 Hz in the same ear greater than or equal to 25 dB (no age adjustment allowed)? If yes, continue to Step 3.

Step 3: Is the STS confirmed upon 30-day retest (or was a retest not conducted)? If yes, continue to Step 4.

Step 4: Record the case on MIOSHA Form 300 within 7 days of retest (or within 37 days of test if retest is not conducted), unless a physician or other licensed health care professional has determined that the shift in hearing is not work related (i.e. hearing loss has not been significantly aggravated by occupational noise exposure).

Where can an employee or employer find out more about this health standard?

Employers, employees and other interested parties may obtain information about the MIOSHA Occupational Noise Exposure Standard by contacting MIOSHA Consultation Education & Training Division, 530 W. Allegan Street, P.O. Box 30643, Lansing, MI 48909-8143, (517) 284-7720. Additional information and standards are available on-line at www.michigan.gov/miosha.