

Hearing Conservation: Audiometric Testing & Earplug Fitting

1.0 Objective & Intent

The objective of this SOP is to establish a standardized procedure for conducting baseline and annual audiometric testing and providing proper earplug fitting for all employees exposed to noise levels at or above 85 dBA Lex in the cabinet and millwork manufacturing facility. This procedure ensures compliance with WorkSafeBC Occupational Health and Safety Regulation (OHSR) Part 7 – Noise Exposure and Hearing Conservation, and mitigates the risk of noise-induced hearing loss (NIHL) through early detection and prevention.

2.0 Operational Scope

This procedure applies to all employees, including production workers, maintenance personnel, and supervisors, who are assigned to work in areas where noise levels equal or exceed 85 dBA Lex, as identified by the facility's noise mapping and exposure monitoring. Audiometric testing and earplug fitting shall be conducted by a certified audiometric technician or qualified occupational health professional. The procedure covers all hearing conservation zones within the facility, including the CNC machining area, panel saw area, sanding room, and assembly lines.

3.0 Hazard Identification & Mandatory PPE

- Noise-Induced Hearing Loss (NIHL): Cumulative and irreversible damage from prolonged exposure to machinery noise (e.g., CNC routers, panel saws, sanders, dust collectors).
- Improper Earplug Fit: Inadequate attenuation due to incorrect sizing or insertion, leading to false sense of protection and increased risk of NIHL.
- Cross-Contamination: Sharing of earplugs or testing equipment without proper sanitation can cause ear infections or dermatitis.
- Temporary Threshold Shift: Short-term hearing loss after a shift that may mask permanent damage if not detected through baseline testing.
- Mandatory PPE: CSA-approved hearing protection (earplugs or earmuffs) must be worn at all times in designated hearing conservation zones. For testing, no PPE is required during the audiometric test itself, but earplugs are required for fitting and subsequent use.

4.0 Required Safety Equipment & Tools

- Audiometer (calibrated annually per ANSI S3.6 standards) with TDH-39 or equivalent headphones
- Sound-attenuating booth or quiet room (ambient noise levels < 40 dBA per ANSI S3.1)
- Disposable foam earplugs (various sizes: small, medium, large) and reusable earplugs (if applicable)
- Earplug fitting verification tool (e.g., E-A-Rfit Dual-Ear Validation System or equivalent)
- Alcohol wipes or sanitizing solution for cleaning reusable earplugs and headphone cushions
- Audiometric test record forms (paper or digital) and employee hearing conservation files
- Personal protective equipment for technician: nitrile gloves, safety glasses

5.0 Step-by-Step Safety Procedure

1. Verify that the audiometer has been calibrated within the last 12 months and perform a daily biological calibration check (listen for distortion or abnormal tones) before any testing. Document the calibration check on the test log.
2. Ensure the testing environment meets ambient noise criteria: close all doors, turn off nearby machinery, and confirm that background noise does not exceed 40 dBA using a sound level meter. Post a sign outside the testing area indicating that audiometric testing is in progress.
3. Instruct the employee to remove any hearing protection, headphones, or ear jewelry at least 14 hours prior to the test to avoid temporary threshold shift. Confirm that the employee has not been exposed to loud noise (above 85 dBA) for the past 14 hours; if they have, reschedule the test.
4. Seat the employee in the sound-attenuating booth or quiet room. Provide clear instructions: remain still, do not talk, and press the response button immediately upon hearing a tone, regardless of how faint. Explain that the test will take approximately 15 minutes.
5. Conduct the audiometric test using the modified Hughson-Westlake procedure: present pure tones at 500, 1000, 2000, 3000, 4000, 6000, and 8000 Hz for each ear separately. Record the threshold at each frequency. If the employee fails to respond consistently, repeat the test at that frequency.
6. Compare the test results to the employee's baseline audiogram (if available). Identify any standard threshold shift (STS) defined as a change in hearing threshold of an average of 10 dB or more at 2000, 3000, and 4000 Hz in either ear. If an STS is detected, notify the employee and schedule a follow-up with a qualified audiologist within 30 days.
7. After the test, proceed to earplug fitting. Select the appropriate size of disposable foam earplugs based on the employee's ear canal size (visual inspection). Instruct the employee to roll the earplug into a thin, crease-free cylinder, reach over the head with the opposite hand to pull the ear upward and outward, and insert the earplug until it is fully seated.
8. Verify the earplug fit using the fitting verification tool. Measure the noise reduction rating (NRR) achieved; the employee must achieve a minimum attenuation of 25 dB at 2000 Hz. If the fit is inadequate, repeat the insertion process with a different size or type of earplug until proper attenuation is achieved.
9. Document the test results, earplug type and size, and verification results on the employee's hearing conservation record. Provide the employee with a copy of their audiogram and a written summary of their hearing status. Instruct them to wear the fitted earplugs in all hearing conservation zones and to report any changes in hearing or ear discomfort immediately.
10. Sanitize all equipment after each use: wipe down headphone cushions with alcohol wipes, dispose of used foam earplugs, and clean reusable earplugs with soap and water. Store the audiometer in a clean, dry location and secure the test records in a locked filing cabinet or encrypted digital system.

Regulatory Disclaimer: This document is a generic safety template provided for educational and informational purposes only. It does not constitute professional engineering, legal, or regulatory compliance advice. The end-user assumes all liability for validating all safety protocols against specific machinery manufacturer manuals and local occupational health and safety regulations (e.g., WorkSafeBC, CSA standards) before deployment.