

# **WORKCOVER WA**

## **NOISE INDUCED HEARING LOSS LEGISLATION**

### **APPENDIX ONE**

#### **Approved Method Acoustic Measurement of Audiometric Booths**

**2000 Revised Edition**

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The Workers' Compensation and Rehabilitation Commission acknowledge the contribution of the Noise Induced Hearing Loss Approved Procedures Working Party Members.

## CONTENTS

1.0	SCOPE AND GENERAL.....	4
1.1	Scope .....	4
1.1	Application .....	4
1.2	Approved Noise Measurement Officers.....	4
1.3	Time of Assessments .....	4
1.4	Frequency of Tests.....	4
1.5	Instrumentation.....	5
1.6	Definitions.....	5
2.0	NOISE MEASUREMENT PROCEDURE .....	5
2.1	General.....	5
2.2	Measurement of Background Noise Level.....	5
2.2.1	Operational State of Booth .....	5
2.2.2	Measurement of Background Noise Level within the Booth .....	6
2.3	Measurement Procedures .....	6
2.4	Environment Surrounding the Booth.....	6
3.0	ADDITIONAL INFORMATION .....	6
3.1	Acceptability of Booth for Various Earphone Combinations .....	6
3.2	Mobile Booths.....	6
4.0	REPORTING REQUIREMENTS.....	7
4.1	General Matters.....	7
4.2	Details of Noise Measurement Officer.....	7
4.3	Audio Booth Performance (Background noise level).....	7
4.4	Environment External to Booth .....	7
4.5	Sound Level Meter Details.....	7

## **APPROVED METHOD ACOUSTIC MEASUREMENT OF AUDIOMETRIC BOOTHS**

### **1.0 SCOPE AND GENERAL**

#### **1.1 Scope**

These procedures set out the method for acoustic evaluation of an Audiometric Booth to comply with the requirements of WorkCover. It provides a means of assessing the acoustic performance of the booth in terms of:

- Background noise level within the booth;

#### **1.1 Application**

The requirements and procedures set out in this document apply to the assessment of both fixed and mobile audiometric booths. The objective of this procedure is to present data that will assist audiometric officers and audiologists to assess the acceptability of the environment in which their test booth is located.

#### **1.2 Approved Noise Measurement Officers**

Persons experienced in the measurement of sound shall carry out the noise measurements described in this procedure. These include persons eligible for full membership of the Australian Acoustical Society and Noise Officers active in the measurement of sound.

As such, WorkCover **will** accept evaluations of audiometric booths from those people **currently** registered as WorkSafe Noise Officers; or who are approved by the Department of Minerals and Energy (DME) State Mining Engineer under the Mines Safety and Inspection Regulations 1995; or who are eligible for full membership of the Australian Acoustical Society.

WorkCover **will not** accept booth evaluations from Noise Officers whose accreditation has lapsed with WorkSafe unless they are eligible for full membership of the Australian Acoustical Society or approved by DME. Those officers whose WorkSafe accreditation has lapsed are advised to contact DME on 9222 3128 regarding re-accreditation.

#### **1.3 Time of Assessments**

All audiometric booth assessments must be conducted during the normal working hours for that booth, i.e., when audiometric tests are usually conducted.

#### **1.4 Frequency of Tests**

Audiometric Booths are subject to deterioration over time in that the effectiveness of door seals is reduced and noise levels of fans can increase due to mechanical wear. For this reason all fixed booths are to be tested every three years. The performance of mobile booths is likely to deteriorate far more rapidly. For this reason, mobile booths should be re-evaluated every two years.

## 1.5 Instrumentation

Generally the sound level meters used in this procedure shall be Precision Type 1 meters. Noise measurement officers should be aware that the noise floor on many sound level meters is above the acceptable background noise level permitted for certain earphone/cushion combinations. These sound level meters are therefore not suitable for evaluation of high performance booths. It is the responsibility of the officer testing the booth to ensure instrumentation suitable for measuring low sound levels is used. Sound level meters used in the testing of the audiometric booths shall have been calibrated within the past two years.

## 1.6 Definitions

For the purpose of this procedure, the following definitions apply:

*Background Noise Level:* The noise level inside the booth with the fan (if fitted) turned on maximum speed, with normal operating conditions outside the booth.

## 2.0 NOISE MEASUREMENT PROCEDURE

### 2.1 General

The assessment of a fixed or mobile booth requires the acoustic measurement of:

- Background noise level inside booth;
- As mobile booths are located in varying noise conditions, specific requirements are covered in Clause 3.2.

### 2.2 Measurement of Background Noise Level

#### 2.2.1 Operational State of Booth

The booth shall be in normal operational mode during the measurement of the background noise.

If a fan is fitted, for the purpose of the acoustic evaluation, the fan shall be switched **ON** for the entire measurement procedure. Where a variable speed fan is provided, the fan setting shall be set at 'maximum speed'.

### **2.2.2 Measurement of Background Noise Level within the Booth**

In measuring the background noise level within an audiometric booth, it is common for noise associated with normal human functioning (e.g. breathing), to interfere with the results. For this reason, measurements should be made with Sound Level Meter (SLM) on a tripod and the noise measurement officer located outside the booth. For most booths the results of the measurement can be read on the Sound Level Meter through the observation window.

*Microphone Position:* The SLM shall be mounted on a tripod facing the observation window with the microphone located at the position of the ear of a seated person within the booth; i.e. 1.2 meters above floor of booth.

### **2.3 Measurement Procedures**

The measurements shall be made in octave bands with centre frequencies in the range of 125 Hz to 8,000 Hz. The sound level meter shall be set to measure Sound Pressure Level on slow response and Linear weighting. The reading of the sound pressure level shall be made when the indication of the sound pressure on the meter settles. If the sound pressure level varies, then the average of the maxima readings shall be reported. The time period for each octave band shall not be less than 60 seconds. Where noise events external to the booth affect the noise level inside the booth, this should be noted and reported. See Section 4.3.

### **2.4 Environment Surrounding the Booth**

A description of the environment in which the booth is located should identify the noise sources both external (e.g., traffic) and internal (e.g., air conditioning, adjacent offices etc) to that environment.

## **3.0 ADDITIONAL INFORMATION**

### **3.1 Acceptability of Booth for Various Earphone Combinations**

Background noise levels within the booth/testing environment must not exceed those values listed in Appendix C of Australian Standard AS/NZS 1269.4:1998 for the type of earphone/cushion/enclosure combination connected to the audiometer used for testing.

High performance booths/testing environments, i.e., those required for full audiological assessments must not exceed the values listed in the top two lines of Appendix C of Australian Standard AS/NZS 1269.4:1998.

***It is WorkCover's responsibility to determine which earphone/cushion/ enclosure combination(s) are acceptable.***

### **3.2 Mobile Booths**

The initial assessment of a mobile booth must be conducted in an area where the external noises would simulate conditions in which audiometric testing would normally be undertaken e.g., outside a factory or workshop.

As the environment surrounding a mobile booth change each time the booth is relocated, the audiometric officer must measure the background noise levels (inside the booth) prior to commencing testing in a new location.

The measured background noise levels shall be recorded in the WorkCover WA Noise Induced Hearing Loss Approved Mobile Audiometric Booth diary (copies available from WorkCover). This diary is to be available for inspection as and when required.

## **4.0 REPORTING REQUIREMENTS**

Attached is a standard reporting sheet (Form B1) for information gained in the evaluation of an audiometric booth and the environment in which it is located. In addition to the measurement results, it is necessary that the environment be described. The data required includes:

### **4.1 General Matters**

- Booth owner details;
- Previous WorkCover number
- Date and time of test;
- Booth location;
- Booth dimensions & fan operation details;

### **4.2 Details of Noise Measurement Officer**

- Name of Noise Measurement Officer;
- Company and company address;
- Qualification details

### **4.3 Audio Booth Performance (Background noise level)**

- Background noise level in booth;
- Description of any transient noise levels which resulted in fluctuations of the noise level during measurement procedures.

### **4.4 Environment External to Booth**

- Description of environment in which the booth is located;
- Description of noises perceptible in the environment.

### **4.5 Sound Level Meter Details**

- Make, Model and serial number of Sound Level Meter used in test;
- Microphone type
- Last calibration date of Sound Level Meter (copy of calibration certificate to be provided where possible).