

Australian/New Zealand Standard™

Occupational noise management

Part 3: Hearing protector program



AS/NZS 1269.3:2005

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STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

RECONFIRMATION
OF
AS/NZS 1269.3:2005
Occupational noise management
Part 3: Hearing protector program

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Technical Committee AV-003 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

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NOTES

Australian/New Zealand Standard™

Occupational noise management

Part 3: Hearing protector program

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee AV-003, Acoustics, Human Effects to supersede, AS/NZS 1269.3:1998, *Occupational noise management, Part 3: Hearing protector program*.

This is Part 3 in a series of Standards as follows:

AS/NZS

1269	Occupational noise management
1269.0	Part 0: Overview and general requirements
1269.1	Part 1: Measurement and assessment of noise immission and exposure
1269.2	Part 2: Noise control management
1269.3	Part 3: Hearing protector program (this Standard)
1269.4	Part 4: Auditory assessment

The objective of this series of Standards is to provide requirements and guidance on all facets of occupational noise management. It is recommended that the reader refer to all Parts of AS/NZS 1269 to better understand all relevant terminology and objectives of occupational noise management.

The objective of this Part is to give requirements and guidance to people who supply, purchase or wear hearing protectors and to encourage the use of effective criteria in their selection, use, care and maintenance.

The objective of this revision is to confirm the existing Standard with a few minor changes.

Hearing protectors are items of personal protection which, as a result of their sound attenuation properties, reduce the effects of noise on hearing in order to avoid hearing damage. In order that the protection offered by hearing protectors be effectively realized, hearing protectors should be used all the time that the user is in a potentially excessive noise environment. In the selection of hearing protectors, attention is therefore drawn to the importance of considering factors which may influence comfort and acceptance.

In occupational noise management programs, measures other than personal hearing protection such as the identification of noise areas, and the assessment of personal noise exposure and noise control, require attention as priorities.

In the preparation of this document cognizance was taken of EN 458, *Hearing protectors—Recommendations for the selection, use, care and maintenance*.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance.

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STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

**Australian/New Zealand Standard
Occupational noise management****Part 3: Hearing protector program****1 SCOPE**

This Standard specifies—

- (a) the administrative responsibilities associated with a hearing protector program;
- (b) the selection, use and maintenance of various types of hearing protectors; and
- (c) training and motivation in regard to hearing protector programs.

It excludes the setting of occupational noise criteria. Such criteria are set by regulations or organizational policy, not by Standards Australia or Standards New Zealand. Exposure standards may be found in the occupational health and safety or related regulations that are applicable for the workplace under assessment. Criteria lower than these exposure standards may be set by the organization's noise policy.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

1319 Safety signs for the occupational environment

AS/NZS

1269 Occupational noise management

1269.0 Part 0: Overview and general requirements

1269.1 Part 1: Measurement and assessment of noise immission and exposure

1269.2 Part 2: Noise control management

1269.4 Part 4: Auditory assessment

1270 Acoustics—Hearing protectors

NOHSC

Worksafe Australia, *Noise Management at Work—Control Guide*, 2nd Edition. Sydney, National Occupational Health and Safety Commission, 1991.

3 DEFINITIONS

For the purpose of this Standard, the definitions given in AS/NZS 1269.0, AS/NZS 1269.1 and those below apply.

3.1 Care

The day-to-day attention given by the wearer to the protector.

3.2 Criterion eight-hour equivalent continuous A-weighted sound pressure level, $L(\text{crit})_{\text{Aeq},8\text{h}}$

The eight-hour equivalent continuous A-weighted sound pressure level above which the provision of hearing protectors is required by legislation or by the organization's noise policy, whichever is the lower.

3.3 Criterion peak sound pressure level, $L(\text{crit})_{\text{peak}}$

The peak sound pressure level above which the provision of hearing protectors is required by legislation or by the organization's noise policy, whichever is the lower.

3.4 Effective level (of a sound for people wearing hearing protectors) $L(\text{eff})$

A quantity derived by subtracting the attenuation of a hearing protector from the level of the sound in which it is worn.

The value of $L(\text{eff})$ is not measured directly, but is calculated by the methods given in Appendix A.

NOTES:

- 1 Because different wearers obtain different attenuation from the same hearing protector, attenuation values are expressed in statistical terms, usually as the attenuation value obtained or exceeded by 80% of wearers. Since it is derived from statistical attenuation values, $L(\text{eff})_{\text{Aeq}}$ is also expressed in statistical terms, e.g. as the value of $L(\text{eff})_{\text{Aeq}}$ below which 80% of wearers are expected to fall.
- 2 Analogous to the way the term 'level' is further qualified when used to refer to exposure level, immission level, octave-band level, etc., the term 'effective level' may be similarly qualified to refer to effective exposure level, effective immission level, effective octave-band level, etc. Accordingly, the symbol $L(\text{eff})$ may be subscripted following the same conventions as those used for subscripting L ; thus where $L_{\text{Aeq},Ti}$ stands for partial exposure level, $L(\text{eff})_{\text{Aeq},Ti}$ stands for effective partial exposure level, etc.
- 3 The value of the quantity $L(\text{eff})$ is not necessarily the same as the value of the A-weighted sound level that may be measured in the ear canal of a person wearing a hearing protector.

3.5 Maintenance

The regular inspection and repair of the protector, e.g. the replacement of defective earmuff cushions.

3.6 Over-protection

The selection and wearing of a hearing protector with unnecessarily high attenuation.

NOTE: This may lead to a sense of isolation and difficulties with perception of sound.

3.7 Selection

The process of choosing the most suitable protector.

3.8 Use

The day-to-day wearing of a hearing protector by the person to be protected.

4 MANAGEMENT RESPONSIBILITY

If the protection from occupational noise requires the use of hearing protectors, the purchase and issue of such equipment forms only part of the overall management responsibility. A comprehensive and properly managed hearing protector program, as outlined in this Clause, shall be implemented.

The hearing protector program shall be established by management and an individual shall be designated to manage the program. The person should have a technical and professional background enabling them to make sound decisions based on evaluation and understanding of workplace hazards. The individual should preferably be a safety officer, occupational hygienist, occupational health nurse or physician. In a small company, the program may be managed by the company owner, foreperson or other supervisory personnel. Regardless of who assumes responsibility for the program, the program manager shall have the full support of management. The person shall develop a standard operating procedure. It should be based upon the following:

- (a) Documentation showing the reasons why the hearing protectors selected were considered the most suitable.
- (b) A training program in which personnel can become familiar with hearing protectors, including selection and proper fitting procedures as well as the proper use and limitations of the equipment.
- (c) Provisions for assigning a selected range of suitable hearing protectors to people for their exclusive use.
- (d) A record of which type of hearing protector has been issued to each person.
- (e) Provisions for adequate supplies of hearing protectors at accessible locations.
- (f) Provisions for regular cleaning of the hearing protectors.
- (g) Provisions for proper storage of the hearing protectors.
- (h) Provisions for periodic inspection and maintenance of the hearing protectors.
- (i) Provisions for the identification and marking of areas where hearing protectors must be worn and ensuring that protectors are worn as required.
- (j) Continuing education and motivation programs, designed to promote correct wearing of hearing protectors and to maintain a responsible, positive attitude towards hearing preservation.
- (k) Ongoing auditing by the program manager to ensure its continued functioning and effectiveness.
- (l) Evaluation of each person assigned to wear hearing protectors to determine if he or she is physically suited.
- (m) Provision for ongoing auditory assessment if appropriate (see Clause 13).

5 HEARING PROTECTORS

5.1 General

The primary function of a hearing protector is to reduce the amount of noise reaching the inner ear of the wearer. This can be achieved by—

- (a) completely covering the entire ear;
- (b) covering the entrance to the ear canal;
- (c) completely occluding the ear canal itself;
- (d) neutralizing the noise through electronic means before it reaches the ear (see Clause 5.2.5(b)); or
- (e) covering a large part of the head as well as the outer ear (see Clause 5.2.4).

5.2 Types of hearing protectors

5.2.1 Earmuffs

Earmuffs comprise cups which fit over the ears and are sealed to the head with soft cushions, usually filled with plastic foam or liquid. The cups are usually lined with a noise-absorptive material. The two cups are usually connected by a spring band designed to be worn around the head, neck or chin, but may also be fitted separately on either side of a hard hat or other headgear.

5.2.2 Earplugs

Earplugs are hearing protectors which are inserted into the ear canal. There are several types of earplugs as follows:

- (a) *Pre-moulded earplugs* These are inserted into the ear canal without the need for prior shaping. Pre-moulded earplugs are made from an array of materials, and available in a range of sizes.
- (b) *User formable earplugs* These are generally made from a compressible material that is moulded by the user before insertion into the ear canal. After insertion, this type of plug often expands to form a seal with the walls of the ear canal.
- (c) *Custom-moulded earplugs* These earplugs are custom-made from a silicone or acrylic mould of the ear canal, which means that each plug is designed to fit only the ear for which it was made.
- (d) *Banded earplugs* Banded earplugs are earplugs usually of soft silicone, rubber or plastic, and suspended on a headband.

5.2.3 Ear canal caps

Ear canal caps seal the entrance to the ear canal, without actually entering it. A spring headband is used to hold the caps in position.

5.2.4 Acoustic helmets

Acoustic helmets cover a large part of the head as well as the outer ear. This may not only provide direct hearing protection, but also diminish bone conduction of the sound to the ear by reducing airborne sound to the skull.

5.2.5 Special types of hearing protectors

The following types of hearing protectors utilize mechanical techniques, electronic circuitry, microphones and loudspeakers in various ways to achieve noise reduction or noise reduction and communication:

- (a) *Level-dependent protectors* These are designed to provide increased protection as the sound level increases. A typical example is impulse noise protectors, whose amplification circuitry allows communication at normal voice levels to be conducted, while rapidly attenuating any loud noise. They may be either electronic or non-electronic.
- (b) *Active noise reduction (ANR) protectors* This type of protector reacts to noise by duplicating the noise pattern and inverting it, which results in dynamic noise cancellation inside the protector. ANR technology is usually applied to constant noise patterns, such as machines and motors.
- (c) *Communication hearing protectors* These are either wireless or of the plug-in type. The protector provides hearing protection through conventional attenuation, but contains earphones which allow messages, signals, alarms or entertainment programs to be relayed to the wearer. Communication hearing protectors may also be fitted with microphones connected to two-way radios, which facilitate person-to-person conversation.

NOTES:

- 1 Standards for measuring the performance of these hearing protectors are still under development.
- 2 Recommended procedures for measurement of the sound pressure levels from headphones or insert earphones are covered in AS/NZS 1269.1.

6 SELECTION OF HEARING PROTECTORS

6.1 Compliance of hearing protectors

6.1.1 *General*

All hearing protectors used shall be type-tested to and comply with the requirements of AS/NZS 1270 where there is an appropriate category. The testing shall be carried out by a laboratory independently accredited to test according to AS/NZS 1270. Where there is no appropriate category in AS/NZS 1270, hearing protectors meeting relevant legislative requirements shall be selected.

6.1.2 *Attenuation values*

Attenuation values used in all selection procedures, including octave-band and classification methods, shall be mean minus standard deviation values derived from attenuation measurements made in accordance with AS/NZS 1270.

6.1.3 *Test reports*

Purchasers should obtain information from suppliers on the attenuation of hearing protectors they are considering purchasing. The information shall contain a statement that the hearing protectors comply with the requirements of AS/NZS 1270. The information provided shall also include the results of attenuation measurements conducted according to AS/NZS 1270, the name of the test laboratory and the date of the test. Where there is no appropriate category in AS/NZS 1270 the information from suppliers shall contain a test report containing the results of attenuation measurements, the name of the test laboratory and the date of the test.

6.2 Attenuation requirement

6.2.1 *General*

If the $L_{Aeq,8h}$ exceeds the $L(crit)_{Aeq,8h}$, hearing protectors shall be selected according to the methods specified in Appendix A. If the L_{peak} exceeds the $L(crit)_{peak}$, hearing protectors shall be selected according to the methods specified in Appendix B.

Hearing protector attenuation obtained in the working environment may be lower than that obtained in a laboratory test. The actual attenuation will depend on many factors, some of which are—

- (a) desire to fit properly;
- (b) glasses;
- (c) long hair;
- (d) protective equipment;
- (e) age of protector;
- (f) condition of the hearing protector; and
- (g) poor fitting.

Guidance on the influence of these factors should be sought from the manufacturer. The difference can be minimized by careful selection, fitting and maintenance (see Clauses 6.5, 7.2 and 8.4).

As a practical measure many organizations make it a rule that people must wear hearing protectors whenever they are in areas or operating equipment where the immission level exceeds a specified value, such as 85 dB(A).

The noise level may be determined by either a direct measurement through the use of a sound level meter or through subjective judgement.