AS 2107—1987

Australian Standard®

Acoustics—Recommended design sound levels and reverberation times for building interiors

This Australian standard was prepared by Committee AV/4, Acoustics – Architectural. It was approved on behalf of the Council of the Standards Association of Australia on 8 October 1986 and published on 5 January 1987.

The following interests are represented on Committee AV/4:

Association of Australian Acoustical Consultants

Australian Acoustical Society

Building Management Authority, W.A.

Confederation of Australian Industry

CSIRO, Division of Building Research

Department of Housing and Construction

Public Works Department, N.S.W.

Royal Australian Institute of Architects

Royal Melbourne Institute of Technology

State Pollution Control Commission, N.S.W.

University of New South Wales

University of Sydney

Review of Australian Standards. *To keep abreast of progress in industry, Australian Standards are subject to periodic review and are kept up to date by the issue of amendments or new editions as necessary. It is important therefore that Standards users ensure that they are in possession of the latest edition, and any amendments thereto.*

Full details of all Australian Standards and related publications will be found in the Standards Australia Catalogue of Publications; this information is supplemented each month by the magazine 'The Australian Standard', which subscribing members receive, and which gives details of new publications, new editions and amendments, and of withdrawn Standards.

Suggestions for improvements to Australian Standards, addressed to the head office of Standards Australia, are welcomed. Notification of any inaccuracy or ambiguity found in an Australian Standard should be made without delay in order that the matter may be investigated and appropriate action taken.

This Standard was issued in draft form for comment as DR 85327.

AS 2107—1987

Australian Standard®

Acoustics—Recommended design sound levels and reverberation times for building interiors

First published 1977
Second edition 1987

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
1 THE CRESCENT, HOMEBUSH, NSW 2140

ISBN 0 7262 4455 4

PREFACE

This standard was prepared by the Association's Committee on Acoustics— Architectural, to supersede AS 2107—1977, Code of Practice for Ambient Sound Levels for Areas of Occupancy Within Buildings.

This edition incorporates certain changes to clarify some of the provisions. The table of recommended design sound levels has been expanded to cover additional types of occupancy/activity, and recommended reverberation times have been added.

CONTENTS

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
ACOUSTICS—RECOMMENDED DESIGN SOUND LEVELS AND REVERBERATION TIMES FOR BUILDING INTERIORS

1 SCOPE. This standard sets out design criteria for conditions affecting the acoustic environment within occupied spaces. The ambient sound levels recommended take into account the function of the area(s) and apply to the sound level measured with the space unoccupied but ready for occupancy (see Note 1). The standard is applicable to steady-state or quasi-steady-state sounds, such as noise from air-conditioning systems, and noise from continuous road traffic. The reverberation times recommended are for the occupied state of the enclosure.

NOTES:

1. The sound level during occupancy will usually be increased owing to the activities of the occupants.
2. For auditoriums or studios, exclusion of sound other than that of the performance is vital for the successful operation of the space. In other areas, the level of ambient sound may affect speech communication or, in extreme conditions, the effectiveness of a public address system. Control of the ambient sound level is required to achieve good communications. On the other hand, spaces such as offices and restaurants may benefit from some continuous ambient sound, which may assist in providing privacy between adjacent groups of people or in reducing distraction where people are concentrating on some particular task.
3. This standard does not exclude a current practice, where, for the purpose of acoustic masking, continuous ambient sound may be deliberately introduced at a particular level. Conditions affecting the use of acoustic masking are given in Clause 8.
4. For buildings located near airports, reference should be made to AS 2021.

2 APPLICATION. This standard is intended to assist designers to provide a satisfactory acoustic environment within occupied spaces in new and existing buildings. It is also intended for application in the selection and assessment of the building materials and services used in these spaces, as well as building components that exclude noise external to the building (e.g. traffic, industrial noise) and within the building (e.g. building services noise).

NOTES:

1. Attention is drawn to the additive noise effect of many machines within the same area and adjacent areas. Allowance for the total number and type of noise sources should therefore be made in the selection of equipment and in the design of the building spaces.
2. See Appendix D for guidance regarding sound level measurements to determine the compliance with specifications of noise levels of plant and equipment that have been used in occupied spaces.

3 REFERENCED DOCUMENTS. The following documents are referred to in this standard:

AS 1259	Sound Level Meters
AS 1469	Acoustics—Methods for the Determination of Noise Rating Numbers
AS 1633	Acoustics—Glossary of Terms and Related Symbols
AS 2021	Acoustics—Aircraft Noise Intrusion—Building Siting and Construction
AS 2460	Acoustics—Measurement of Reverberation Time in Enclosures
AS 2659	Guide to the Use of Sound Measuring Equipment Part 2—Portable Equipment for Integration of Sound Signals
AS 2822	Acoustics—Method of Assessing and Predicting Speech Privacy and Speech Intelligibility
SAA MP44	Guide for the Use of Sound Measuring Equipment Part 1—Portable Sound Level Meters*
IEC 804	Integrating-averaging Sound Level Meters

4 DEFINITIONS. For the purpose of this standard, the following definitions apply:

4.1 A-weighted sound pressure level (L_A)—the level of the frequency-weighted sound pressure, as determined by an integrating sound level meter complying with IEC 804 or a time-weighting sound level meter complying with AS 1259.

4.2 Noise rating number (*NR*)—a number ascribed to a set of octave-band sound pressure levels following the procedures specified in AS 1469.

4.3 60-second equivalent continuous A-weighted sound pressure level ($L_{Aeq,60}$)—the value of the A-weighted sound pressure level of a continuous steady sound that, within a measurement time interval of 60 s, has the same mean square sound pressure as a sound under consideration whose level varies with time.

4.4 Reverberation time (*T*)—of an enclosure in a given frequency band: the time required for the average sound energy density in the enclosure to decrease to 10^{-6} of the initial value (i.e. by 60 dB) after the source is stopped.

NOTE. For definitions of other acoustic terms, see AS 1633.

5 METHOD OF MEASUREMENT.

5.1 Measurement of ambient sound level.

5.1.1 *General.* The measurement procedures specified in Clause 5 serve to define the quantities dealt with in the recommendations of this standard, and provide a means whereby the achievement of design goals can be checked, in a completed building.

The preferred type of measurement is a 60-second equivalent sound level, being either $L_{Aeq,\ 60}$ where an A-weighted overall level is required, or $L_{0eq,\ 60}$, where octave band sound pressure levels are required for determining an *NR* number. The measurement shall be performed either directly by the preferred method

* SAA MP44, Part 1 is to be revised and published as AS 2659, Part 1.