AS 1191—1985

Australian Standard®

Acoustics – Method for laboratory measurement of airborne sound transmission loss of building partitions

This Australian standard was prepared by Committee AK/4, Architectural Acoustics. It was approved on behalf of the Council of the Standards Association of Australia on 10 September 1985 and published on 4 October 1985.

The following interests are represented on Committee AK/4:

Australian Acoustical Society
Association of Australian Acoustical Consultants
Building Management Authority, Western Australia
Confederation of Australian Industry
CSIRO, Division of Building Research
Department of Employment and Industrial Relations
Institution of Engineers, Australia
National Building Technology Centre
Public Works Department, New South Wales
Royal Australian Institute of Architects
Royal Melbourne Institute of Technology
State Pollution Control Commission New South Wales
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PREFACE

This edition of this standard was prepared by the Association's Committee on Architectural Acoustics, to supersede AS 1191—1976, Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.

This standard prescribes parameters for the rooms used for the measurement, the range of frequencies to be measured, the manner in which sound fields are to be generated and the characteristics of the filters used. This ensures that the results will be meaningful and reproducible in other laboratories. Definitions are given of the quantities measured and of the method of normalizing results to make them comparable. The information to be included in the statement of results is also prescribed. The essential requirements for the determination of the airborne transmission loss of a partition element are given in the body of the standard, and additional explanatory material is provided in an appendix.

This standard is based on the following ISO standards:

ISO 140/1 Acoustics—Measurement of Sound Insulation in Buildings and of Building Elements, Part I—Requirements for Laboratories

ISO 140/3 Acoustics—Measurement of Sound Insulation in Buildings and of Building Elements, Part III—Laboratory Measurements of Airborne Sound Insulation of Building Elements.

This standard differs in its presentation, but conforms closely to the essential principles of the above ISO standards.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

for

ACOUSTICS—METHOD FOR LABORATORY MEASUREMENT OF AIRBORNE SOUND TRANSMISSION LOSS OF BUILDING PARTITIONS

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This standard sets out the method for the measurement of the airborne sound transmission loss of building partitions such as walls, floor/ceiling assemblies, doors, windows, and other space-dividing elements. It provides a means of evaluation of the sound-insulating performance of an isolated partition element in a laboratory.

The sound transmission loss is defined in terms of a diffusely incident sound field; such a field is intrinsic to the test procedure.

1.2 APPLICATION. The requirements and procedure set out in this standard apply to the determination of the specific sound-attenuating property called sound transmission loss in suitably constructed laboratory spaces.

NOTES:

1. The essential features of such laboratories are a reverberant source room wherein sounds are generated, and a reverberant receiving room, between which two rooms the specimen for test is placed. The rooms must be of appropriate size and proportions and be built so that the sound transmission other than through the test specimen is negligible.
2. For an example of application of the results of the above method, see AS 1276.

1.3 REFERENCED DOCUMENTS. The following standards are referred to in this standard:

AS 1045	Method of Measurement of Absorption Coefficients in a Reverberation Room
AS 1276	Methods for Determination of Sound Transmission Class and Noise Isolation Class of Building Partitions
AS Z41	Octave, Half Octave and One-third Octave Band Pass Filters Intended for the Analysis of Sound and Vibrations
ISO 140/3	Acoustics—Measurement of Sound Insulation in Buildings and of Building Elements, Part III—Laboratory Measurements of Airborne Sound Insulation of Building Elements
ISO 3534	Statistics—Vocabulary and Symbols

1.4 GENERAL DESCRIPTION OF METHOD

1.4.1 Building facilities. Two reverberation rooms are required, with a test aperture in a common boundary in which the partition under test is installed. These two rooms, designated the source and receiving rooms, should have massive walls, large volumes and diffusing surfaces, so as to provide the necessary exclusion of external noise, flanking sound isolation and sound field diffusion.

1.4.2 Electro-acoustic equipment. Electro-acoustic equipment is required as follows:

(a) To generate a diffuse random noise field in the source room: a random noise generator, an optional bandpass filter, and a power amplifier in the instrument room connected to a loudspeaker or loudspeakers in the source room.

(b) To determine the average sound pressure level in the source room: a microphone and microphone traversing or relocating system connected to an optional attenuator to allow matching of the source and receiving room microphone levels, a sound pressure level measuring system and one-third octave bandpass filter.

(c) To determine the average sound pressure level in the receiving room: a microphone and microphone traversing system or relocating system in the receiving room connected to a sound pressure level measuring system and one-third octave bandpass filter.

(d) To generate a diffuse random decaying noise field in the receiving room: a random noise generator with generator stop switch, an optional bandpass filter and a power amplifier, a loudspeaker or loudspeakers in the receiving room.

(e) To form the decay record of level: a microphone and microphone traversing or relocating system connecting to a sound pressure level measuring system and one-third octave bandpass filter which in turn connect to apparatus (such as a graphic level recorder) for forming and displaying, graphing or evaluating the decay record of level.

1.4.3 Procedures. With the partition under test installed in the test aperture, the following procedure is typically used:

(a) A diffuse random noise field containing at least the one-third octave band of frequencies of interest is generated in the sending room.

(b) The average sound pressure level in the sending room L_{ps} is determined.

(c) The average sound pressure level in the receiving room L_{pr} is determined.

(d) The source room noise is turned off and the average background sound pressure level L_B in the receiving room is determined.

(e) The receiving room level L_{pr} and L_B are compared:

(i) If L_{pr} exceeds L_B by more than 10 dB, no corrections are required.

(ii) If L_{pr} exceeds L_B by between 5 dB and 10 dB, then correction is required.

(iii) If L_{pr} does not exceed L_B by at least 5 dB, then the measurements are invalid.