AS ISO 140.4—2006

Australian Standard™

Acoustics—Measurement of sound insulation in buildings and of building elements

Part 4: Field measurements of airborne sound insulation between rooms (ISO 140-4:1998, MOD)

This Australian Standard was prepared by Committee AV-004, Acoustics Architectural. It was approved on behalf of the Council of Standards Australia on 12 December 2005.
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The following are represented on Committee AV-004:

Association of Australian Acoustical Consultants
Australian Acoustical Society
Australian Building Codes Board
Australian Chamber of Commerce and Industry
Australian Defence Force Academy
Australian Hearing
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Australian Standard™

Acoustics—Measurement of sound insulation in buildings and of building elements

Part 4: Field measurements of airborne sound insulation between rooms (ISO 140-4:1998, MOD)

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee AV-004, Acoustics, Architectural to supersede AS 2253—1979*, Methods of field measurement of the reduction airborne sound transmission in buildings.* After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

This Standard is an adoption with national modifications and has been reproduced from ISO 140-4:1998, and has been varied as indicated to take account of Australian conditions.

Variations to ISO 140-4 for application in Australia are set out in Appendix ZZ.

The objective of this Standard is to provide field methods for measuring the airborne sound insulation properties of interior walls, floors and doors between two rooms under diffuse sound field conditions in both rooms. The measurement of the sound insulation of building partitions and assemblies of building elements installed in buildings is, of necessity, made indirectly by determining the sound pressure levels in the spaces on either side of the building element. The results obtained are affected, to a significant extent, by the nature of these spaces. Hence, procedures suitable for general application are more difficult to implement in the field, where a great variety of room shapes, sizes, diffusion and surface conditions are encountered, than they are in a laboratory where the conditions are standardized.

Practical application of the ISO Standard is difficult for walls adjacent to small spaces or passages, or very large rooms, or rooms with inadequate diffusivity.

This Standard recognizes that the separate determination of the sound transmission in the field through a wall, door or other building element to the exclusion of sound transmission through other building elements (flanking sound transmission paths) is not possible. The resultant determination of the Apparent Sound Reduction Index R cannot be compared with the laboratory Sound Reduction Index R for one element. Consequently the determination of R attributed to one element is not recognized and does not form part of this Standard.

For the purposes of field tests, normal loudspeaker enclosure is considered acceptable, therefore Annex A is not part of this Standard.

This Standard is suitable for the determination of D_{nTw}.

This Standard is not limited to the testing of immediately adjoining spaces. It can be used to determine the sound insulation between spaces connected by common passages or ventilating ducts.

There is no requirement to introduce additional absorption diffusion or furniture into the test environment. It is preferred that they be tested as normally furnished or as agreed to between parties when tested during construction.

As the sound insulation measured between spaces is dependent on the noise source positions, microphone positions, furniture and overall acoustic absorption, the test report shall include sufficient description of the test to permit replication of the test.

The terms ‘normative’ and ‘informative’ are used to define the application of the annex to which they apply. A normative annex is an integral part of a standard, whereas an informative annex is only for information and guidance.

As this Standard is reproduced from an international standard, the following applies:

(a) Its number appears on the cover and title page while the international standard number appears only on the cover.

(b) In the source text 'this part of ISO 140' should read 'this Australian Standard'.

(c) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

Reference to International Standard		*Australian or Australian/New Zealand Standard*	
ISO		AS	
140	Acoustics—Measurement of sound insulation in buildings and building elements	—	
140-2	Part 2: Determination, verification and application of precision data	—	
140-3	Part 3: Laboratory measurements of airborne sound insulation of building elements	1191	Acoustics—Method for laboratory measurement of airborne sound transmission insulation of building elements
		AS ISO	
354	Acoustics—Measurement of sound absorption in a reverberation room	354	Acoustics—Measurement of sound absorption in a reverberation room
		AS/NZS ISO	
717	Acoustics—Rating of sound insulation in buildings and of building elements	717	Acoustics—Rating of sound insulation in buildings and of building elements
717-1	Part 1: Airborne sound insulation	717.1	Part 1: Airborne sound insulation
IEC		AS IEC	
60651	Sound level meters	61672 61672.1 61672.2	Electroacoustics—Sound level meters Part 1: Specifications Part 2: Pattern evaluation tests
60804	Integrating-averaging sound levels meters	61672.1 61672.2	Part 1: Specifications Part 2: Pattern evaluation tests
60942	Sound calibrators	60942	Electroacoustics— Sound calibrators
		AS/NZS	
61260	Electroacoustics—Octave-band and fractional-octave-band filters	4476	Acoustics—Octave-band and fractional-octave-band filters

NOTES

AUSTRALIAN STANDARD

Acoustics—Measurement of sound insulation in buildings and of building elements

Part 4: Field measurements of airborne sound insulation between rooms (ISO 140-4:1998, MOD)

1 Scope

This part of ISO 140 specifies field methods for measuring the airborne sound insulation properties of interior walls, floors and doors between two rooms under diffuse sound field conditions in both rooms, and for determining the protection afforded to the occupants of the building.

The methods give values for airborne sound insulation which are frequency dependent. They can be converted into a single number, characterizing the acoustic performance, by application of ISO 717-1.

The results obtained can be used to compare sound insulation between rooms and to compare actual sound insulation with specified requirements.

NOTE 1 Laboratory measurements of airborne sound insulation of building elements are dealt with in ISO 140-3.

NOTE 2 Field measurements of airborne sound insulation of façade elements and façades are dealt with in ISO 140-5.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 140. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 140 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 140-2:1991, *Acoustics — Measurement of sound insulation in buildings and of building elements — Part 2: Determination, verification and application of precision data.*

ISO 140-3:1995, *Acoustics — Measurement of sound insulation in buildings and of building elements — Part 3: Laboratory measurements of airborne sound insulation of building elements.*

ISO 354:1985, *Acoustics — Measurement of sound absorption in a reverberation room.*

ISO 717-1:1996, *Acoustics — Rating of sound insulation in buildings and of building elements — Part 1: Airborne sound insulation.*

IEC 60651:1979, *Sound level meters.*

IEC 60804:1985, *Integrating-averaging sound level meters.*