

Australian Standard™

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

**Part 8: Laboratory measurements of the
reduction of transmitted impact noise by
floor coverings on a heavyweight
standard floor**



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
National Measurement Institute
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PREFACE

This Standard was prepared by the Standards Australia Committee AV-004, Acoustics Architectural. 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 identical to ISO 140-8:1997, *Acoustics—Measurement of sound insulation in buildings and of building elements—Part 8: Laboratory measurement of the reduction of transmitted impact noise by floor coverings on a heavyweight standard floor*.

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:

<i>Reference to International Standard</i>		<i>Australian or Australian/New Zealand Standard</i>	
ISO		AS ISO	
354	Acoustics—Measurement of sound absorption in a reverberation room	354	Acoustics—Measurement of sound absorption in a reverberation room
140	Acoustics—Measurement of sound insulation in buildings and of building elements	140	Acoustics—Measurement of sound insulation in buildings and of building elements
140-6	Part 6: Laboratory measurements of impact sound insulation of floors	140.6	Part 6: Laboratory measurements of impact sound insulation of floors
		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
717-2	Part 2: Impact sound insulation	717.2	Part 2: Impact sound insulation
IEC		AS IEC	
60651	Sound level meters	61672	Electroacoustic—Sound level meter
		61672.1	Part 1: Specifications
		61672.2	Part 2: Pattern evaluation tests
60804	Integrating-averaging sound level meters	61672.1	Part 1: Specifications
		61672.2	Part 2: Pattern evaluation tests
		AS/NZS	
60942	Sound calibrators	60942	Electroacoustics—Sound calibrators
61260	Electroacoustics—Octave-band-filters and fractional-octave band filters	4476	Acoustics—Octave-band and fractional-octave-band filters

Only international referenced documents that have been adopted as Australian or Australian/New Zealand Standards have been included in this list.

The terms ‘normative’ and ‘informative’ have been used in this Standard 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.

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AUSTRALIAN STANDARD

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

Part 8: Laboratory measurements of the reduction of transmitted impact noise by floor coverings on a heavyweight standard floor

1 Scope

This part of ISO 140 specifies a method for measuring the acoustic properties of floor coverings from the view-point of reducing impact noise transmission. The purpose of this part of ISO 140 is to establish a method for determining the noise reducing value of a floor covering under standard test conditions. The test is limited to the specification of procedures for the physical measurement of sound originating from an artificial source (standard tapping machine) under laboratory conditions and is not directly related to the subjective significance of the results.

This part of ISO 140 is applicable to all floor coverings, whether single or multi-layered, as installed on a standard floor. In the case of multi-layered coverings, they may be factory-assembled or assembled at the test site. The test method applies only to laboratory measurements. It does not contain any provision that permits an assessment of the effectiveness of a floor covering *in situ*.

2 Normative reference(s)

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 140-1:1997, *Acoustics — Measurement of sound insulation in buildings and of building elements — Part 1: Requirements for laboratory test facilities with suppressed flanking transmission.*

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 140-6:—¹⁾ *Acoustics — Measurement of sound insulation in buildings and of building elements — Part 6: Laboratory measurements of impact sound insulation of floors.*

ISO 140-7:—²⁾ *Acoustics — Measurement of sound insulation in buildings and of building elements — Part 7: Field measurements of impact sound insulation of floors.*

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

ISO 717-2:1996, *Acoustics — Rating of sound insulation in buildings and of building elements —Part 2: Impact sound insulation.*

1) To be published. (Revision of ISO 140-6:1978)

2) To be published. (Revision of ISO 140-7:1978)

IEC 651:1979, *Sound level meters*.

IEC 804:1985, *Integrating-averaging sound level meters*.

IEC 942:1988, *Sound calibrators*.

IEC 1260:1995, *Electroacoustics — Octave-band and fractional-octave-band filters*.

3 Definitions

For the purposes of this part of ISO 140, the following definitions apply.

3.1 average sound pressure level in a room, L : Ten times the common logarithm of the ratio of the space and time average of the sound pressure squared to the square of the reference sound pressure, the space average being taken over the entire room with the exception of those parts where the direct radiation of a sound source or the near field of the boundaries (wall, etc.) is of significant influence; it is expressed in decibels.

If a continuously moving microphone is used, L is determined by

$$L = 10 \lg \frac{\frac{1}{T_m} \int_0^{T_m} p^2(t) dt}{p_0^2} \quad \text{dB} \quad \dots(1)$$

where

p is the sound pressure, in pascals;

p_0 is the reference sound pressure and is equal to 20 μPa ;

T_m is the integration time, in seconds.

If fixed microphone positions are used, L is determined by

$$L = 10 \lg \frac{p_1^2 + p_2^2 + \dots + p_n^2}{n p_0^2} \quad \text{dB} \quad \dots(2)$$

where $p_1, p_2, \dots, p_n$ are the r.m.s. sound pressures at n different positions in the room.

In practice, usually the sound pressure levels L_j are measured. In this case L is determined by

$$L = 10 \lg \left(\frac{1}{n} \sum_{j=1}^n 10^{L_j/10} \right) \quad \text{dB} \quad \dots(3)$$

where L_j is the sound pressure level L_1 to L_n at n different positions in the room.

3.2 impact sound pressure level, L_i : The average sound pressure level in a one-third-octave band in the receiving room when the floor under test is excited by the standardized impact sound source; it is expressed in decibels.