AS 1081.2—1990
ISO 1680/2: 1986

Australian Standard®

Acoustics—Measurements of airborne noise emitted by rotating electrical machinery

Part 2: Survey method

This Australian Standard was prepared by Committee AV/6, Acoustics — Machinery Noise. It was approved on behalf of the Council of Standards Australia on 2 February 1990 and published on 7 May 1990.

The following interests are represented on Committee AV/6:

Australian Coal Association

Australian Compressed Air and Mining Equipment Institute

Australian Federation of Construction Contractors

Australian and New Zealand Environmental Council

Confederation of Australian Industry

Construction Equipment Importers and Manufacturers of Australia

Council of the City of Sydney

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National Farmers Federation

Outdoor Power Equipment Association

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PREFACE

This Standard was prepared by the Standards Australia Committee on Acoustics—Machinery Noise to supersede, in part, AS 1081–1975, *Measurement of airborne noise emitted by rotating electrical* machinery. It is identical with and has been reproduced from ISO 1680/2–1986, *Acoustics—Test code for the measurement of airborne noise emitted by rotating electrical machinery*—Part 2: *Survey method*.

This Standard is one of the series which deals with rotating electrical machinery noise, the series being arranged as follows:

Part 1: Engineering method for free–field conditions over a reflective plane.

Part 2: Survey method (this Standard).

For the purpose of this Australian Standard, the ISO text should be modified as follows:

(a) *Clause 3:* The terms which have their equivalents in AS 1633, *Acoustics—Glossary of terms and related symbols* should follow the definitions of the Australian Standard. The terms which do not have equivalents in the AS 1633 should be as in this Standard.

(b) *References:* The reference to other publications should be modified as follows:

ISO		AS	
354	Acoustics–Measurement of sound absorption in a reverberation room	1045	Acoustics–Measurement of sound absorpotion in a reverberation room
1680/1	Acoustics–Test code for the measurement of airborne noise emitted by rotating electrical machinery–Part 2: Engineering method for free–field conditions over a reflective plane	1081.1	Acoustics–Measurement of airborne noise emitted by rotating electrical machinery–Part 2: Engineering method for free–field conditions over a reflective plane
3740	Acoustics–Determination of sound power levels of noise–Guidelines for the use of basic standards and for the preparation of noise test codes	1271.1	Determination of sound power levels of noise sources, Part 1: Guidelines for the use of basic standards for the preparation of noise test codes
3745	Acoustics–Determination of sound power levels of noise sources–Precision methods of anechoic and semi–anechoic rooms	1217.6	Acoustics–Determination of sound power levels of noise sources, Part 6: Precision methods for anechoic and semi–anechoic rooms
3746	Acoustics – Detemination of sound power levels of noise sources–Survey method	1217.7	Acoustics – Determination of sound power levels of noise souces–Part 7: Survey method
IEC			
34/1	Rotating electircal machines Part 1: Rating and performance	1359	Rotating electrical machines–General requirements
651	Sound level matters	1259	Sound level meters

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Acoustics—Measurement of airborne noise emitted by rotating electrical machinery—Part 2: Survey method

0 Introduction

This part of ISO 1680 is based on ISO 3746 and has been drafted in accordance with ISO 3740.

The main purpose of this part of ISO 1680 is to specify a survey method requiring less effort for the measurements than laid down in the engineering method (see ISO 1680/1) and which, in general, results in a lower grade of accuracy. It may also be applied in those cases where one or several conditions (such as operating conditions, number or positioning of microphones) for an otherwise engineering type of measurement cannot be obtained.

1 Scope and field of application

1.1 General

This part of ISO 1680 defines a measurement method for rotating electrical machines operating under steady noise conditions, the result of which can be expressed in sound power levels so that all machines tested using this code can be directly compared.

This part of ISO 1680 applies to the measurement of airborne noise from rotating electrical machines, such as motors and generators (d.c. and a.c. machines) of all sizes, when fitted with all auxiliaries which are necessary to achieve the agreed operating conditions (see clause 6).

This part of ISO 1680 requires the sound pressure levels to be measured on a rectangular parallelepiped surface enveloping the machines from which the A-weighted sound power level produced by the machine is calculated. It outlines the procedures which shall be used to evaluate the test environment and specifies the characteristics of suitable measuring instruments.

This part of ISO 1680 applies to measurements carried out in environmental conditions that meet the criteria given in clause 4 and annex A (environmental correction $K \leq 7$ dB, correction for background noise ≤ 3 dB).

1.2 Measurement uncertainty

Measurements carried out in conformity with this part of ISO 1680 usually result in standard deviations which are equal to or less than those given in table 1.

Table 1 - Uncertainty in determining A-weighted sound power level by the survey method

Application	Standard deviation dB
For a source which produces sounds that contain prominent discrete tones	5
For a source which produces broad-band sounds without prominent discrete tones	4

NOTES:

1 The standard deviations in table 1 include the effects of allowable variations in the positioning of the measurement positions and in the selection of the stipulated measurement surface.

2 The standard deviations given in table 1 reflect the cumulative effects of all causes of measurement uncertainty, excluding variations in the sound power level from test to test, which may be caused, for example, by changes in the mounting or operating conditions of the source. The reproducibility and repeatability of the test results may be considerably better (that is, smaller standard deviations) than the uncertainties given in table 1 would indicate.

3 If the method specified in this part of ISO 1680 is used to compare the A-weighted sound power levels of similar machines which radiate noise acoustically omnidirectional and broad-band in its character, the uncertainty in comparison tends to result in a standard deviation which is equal to or less than 3 dB, provided that the measurements are carried out in the same environment.

4 The standard deviations given in table 1 may be higher when the environmental correction, *K*, established in accordance with the procedure given in annex A, exceeds 7 dB.

2 References

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

ISO 1680/1, *Acoustics — Test code for the measurement of airborne noise emitted by rotating electrical machinery — Part 1: Engineering method for free-field conditions over a reflecting plane*.

ISO 3740, *Acoustics — Determination of sound power levels of noise sources — Guidelines for the use of basic standards and for the preparation of noise test codes*.