Australian Standard®

ACOUSTICS—METHOD FOR THE DETERMINATION OF AIRBORNE NOISE EMITTED BY HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES

Part 1—GENERAL REQUIREMENTS

This Australian Standard was prepared by Committee AV/7, Acoustics—Noise from Office and Household Equipment. It was approved on behalf of the Council of the Standards Association of Australia on 27 July 1987 and published on 1 September 1987.

The following interests are represented on Committee AV/7:

Association of Consulting Engineers, Australia

Australian Acoustical Society

Australian Consumer Association

Australian Environmental Council

Confederation of Australian Industry

CSIRO, Division of Applied Physics

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PREFACE

This Standard was prepared by the Association's Committee on Acoustics—Noise from Office and Household Equipment, at the request of various manufacturing and governmental organisations.

This Standard is based on JEC 704—1, Test Code for the Determination of Airborne Acoustical Noise Emitted by Household and Similar Electrical Appliances, Part 1: General Requirements, and it envisaged that additional Standards in the series will be published in the future, covering the various types of appliances.

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FOREWORD

Although the noise levels produced by household appliances do not generally present a hazard to the hearing of the operator or other exposed persons, the need for standardized procedures for the determination of the noise emitted has been recognized for a long time. Such procedures should be specified not only for special types of appliances, but the principles should be applicable to the majority of appliances in general use.

The potential users of such methods will be manufacturers of household appliances, testing laboratories, labelling organizations, and consumers' unions. Generally, the determination of noise levels is only part of a comprehensive testing procedure covering many aspects of the properties and performance of the appliance. It is therefore important that the requirements for noise measurements (e.g. test environment, instrumentation, and amount of labour involved) should be realistic and easily reproducible.

In most cases, the results of noise measurements will be used for noise level indication purposes (e.g. for noise labelling, in which the results will be utilized for comparing the noise emitted by a specific appliance with the noise emitted by other appliances of the same generic type). In other cases, the results will be taken as basis for engineering action (e.g. in the development stages of a new piece of equipment or in deciding on means for sound insulation). For all purposes, it is important to specify procedures with known accuracy so that the results of measurements taken by different laboratories can be compared.

These conditions have, as far as possible, been taken into account in the preparation of this Standard. The acoustic measuring methods are based on those described in AS 1217.4, Acoustics—Determination of Sound Power Levels of Noise Sources, Part 4—Engineering Methods For Special Reverberation Test Room; and AS 1217.5, Acoustics—Determination of Sound Power Levels of Noise Sources, Part 5—Engineering Methods for Free-field Conditions Over a Reflecting Plane.

The adoption of these methods permits the use of anechoic (or more correctly, hemi-anechoic) chambers and specially adapted reverberant rooms. The result of the measurements is the sound power level of the appliance. Within the measuring uncertainty specifically related to these methods, the results from determination under free-field conditions over a reflecting plane are equal to those obtained in a special reverberant test room.

It should be emphasized that this Standard is concerned with airborne noise only. In some cases, structure-borne noise may be of importance.

STANDARDS ASSOCIATION OF AUSTRALIA

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SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This Standard sets out objective methods of engineering accuracy (engineering method, grade 2 according to ISO 2204) for determining sound power levels of airborne acoustical noise emitted by household and similar appliances within the specified frequency range of interest.

This Standard does not apply to the following:

(a) Appliances, equipment, or machines designed primarily for industrial or professional purposes.

(b) Appliances which are integrated parts of a building or its installations such as equipment for air conditioning, heating, and ventilating (except household fans, cooker hoods, and free-standing heating appliances), oil burners for central heating, pumps for water supply, macerators, and pumps for sewerage systems.

(c) Separate motors or generators.

(d) Appliances intended specifically for outdoor use.

Not included in this Standard are methods for determining sound power levels with greater precision accuracy (precision method, grade 1 according to ISO 2204) specified for example in AS 1217.2, AS 1217.3, and AS 1217.6. They may, however, be applied if the appropriate instrumentation and test environment are available.

1.2 APPLICATION. This Standard applies to electric appliances (including their accessories or components) for household and similar use, supplied from mains or batteries, or from both. The method includes the analysis of octave bands between 125 Hz and 8000 Hz (this interval being, for practical reasons, narrower than the frequency range of audible sound), and for prescribed operating conditions of the appliance to be measured. It may be used for noise labelling testing by the relevant Statutory Authority.

The following sound power levels are used:

(a) Overall A-weighted sound power level (L_{WA}).

(b) Octave band sound power levels (L_{Wf}).

In general, the described methods are specified for appliances operated with no operator present. Only for the (rare) cases where an appliance can only be operated by an operator, or must be fed by an operator, shall a standard test operator be present, as specified in the relevant other Standards in this series.

NOTES:

1. By 'similar use' is understood the use in similar conditions as occur in residential situation (e.g. in inns, coffee houses, tearooms, hotels, barber shops, hairdresser shops, laundrettes) if not otherwise specified in the relevant other Standards in the series.
2. The uncertainties of measurements according to this Standard tend to result, for A-weighted sound power levels, in standard deviations generally not exceeding approximately 2 dB, provided that the noise spectrum does not contain pronounced discrete frequencies, if it does then the magnitude of the uncertainties will be larger. The nominated standard deviations reflect the cumulative effects of all causes of measurement uncertainties, excluding variations in the noise level of the appliance from test to test.
3. The noise values obtained under the described conditions of this Standard will not necessarily correspond to the noise experienced under the operational conditions of practical use (see Clause 4.4 (a)).
4. For quality control during production, etc, simplified methods may be appropriate. For noise control purposes (e.g. development of quieter appliances, insulation of equipment) other measurement methods will usually have to be applied (e.g. narrow-band frequency analysis). Such methods are not covered by this Standard.

1.3 REFERENCED DOCUMENTS. The following Standards are referred to in this Standard:

AS 1055.1 Acoustics—Description and Measurement of Environmental Noise, Part 1—General Procedures

AS 1217.2 Acoustics—Determination of Sound Power Levels of Noise Sources, Part 2—Precision Methods for Broad-band Sources in Reverberation Rooms.

AS 1217.3 Acoustics—Determination of Sound Power Levels of Noise Sources, Part 3—Precision Methods for Discrete-frequency and Narrow-band Sources in Reverberation Rooms.

AS 1217.4 Acoustics—Determination of Sound Power Levels of Noise Sources, Part 4—Engineering Methods for Special Reverberation Test Room.

AS 1217.5 Acoustics—Determination of Sound Power Levels of Noise Sources, Part 5—Engineering Methods for Free-field Conditions Over a Reflecting Plane.

AS 1217.6 Acoustics—Determination of Sound Power Levels of Noise Sources, Part 6—Precision Methods for Anechoic and Hemi-anechoic rooms.

AS 1259 Sound Level Meters.

AS 1633 Acoustics—Glossary of Terms and Related Symbols.

AS 2454 Textile Floor Covering—Definitions, Terminology and Structure Classification.