Sound system equipment –

Part 5:
Loudspeakers

Equipements pour systèmes électroacoustiques –

Partie 5:
Haut-parleurs
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FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.

3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.

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International Standard IEC 60268-5 has been prepared by IEC technical committee 100: Audio, video and multimedia systems and equipment.


The text of this standard is based on the following documents:

<table>
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<th>FDIS</th>
<th>Report on voting</th>
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<td>100/648/FDIS</td>
<td>100/674/RVD</td>
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Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This standard is to be read in conjunction with IEC 60268-1, IEC 60268-2 and ISO 3741.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until 2005. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

A bilingual edition of this standard may be issued at a later date.
SOUND SYSTEM EQUIPMENT –
Part 5: Loudspeakers

1 Scope

This standard applies to sound system loudspeakers, treated entirely as passive elements. Loudspeakers with built-in amplifiers are excluded.

NOTE 1 The term “loudspeaker” used in this standard relates to loudspeaker drive units themselves and also to loudspeaker systems, which comprise one or more loudspeaker drive units provided with a baffle, enclosure or horn and such relevant devices as built-in crossover filters, transformers and any other passive element.

The purpose of this standard is to give the characteristics to be specified and the relevant methods of measurement for loudspeakers using sinusoidal or specified noise or impulsive signals.

NOTE 2 The methods of measurement given in this standard have been chosen for their appropriateness to the characteristics.

NOTE 3 If equivalent results can be obtained using other methods of measurement, details of the methods used should be presented with the results.

NOTE 4 The following items are under consideration:
– loudspeakers with built-in amplifiers;
– measurements under conditions other than free-field, half-space free-field and diffuse field;
– measurements with signals other than sinusoidal or noise or impulsive signals.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050(151), International Electrotechnical Vocabulary (IEV) – Part 151: Electrical and magnetic devices

IEC 60263, Scales and sizes for plotting frequency characteristics and polar diagrams

IEC 60268-1, Sound system equipment – Part 1: General

IEC 60268-2, Sound system equipment – Part 2: Explanation of general terms and calculation methods

IEC 60268-3, Sound system equipment – Part 3: Amplifiers

IEC 60268-11, Sound system equipment – Part 11: Application of connectors for the interconnection of sound system components

IEC 60268-12, Sound system equipment – Part 12: Application of connectors for broadcast and similar use

IEC 60268-14, Part 14: Circular and elliptical loudspeakers; outer frame diameters and mounting dimensions

IEC 60651, Sound level meters

IEC 61260, Electroacoustics – Octave-band and fractional-octave-band filters
3 Conditions for measurement

3.1 General conditions
This standard is to be used in conjunction with IEC 60268-1, IEC 60268-2 and ISO 3741.

3.2 Measuring conditions

3.2.1 General
For convenience in specifying how loudspeakers are to be set up for measurement, normal measuring conditions are defined in this standard. To obtain the correct conditions for measurement, some values (known as “rated conditions”) shall be taken from the manufacturer’s specification. These values themselves are not subject to measurement but they constitute the basis for measuring the other characteristics.

The following values and conditions are of this type, and shall be stated by the manufacturer:
– rated impedance;
– rated sinusoidal voltage or power;
– rated noise voltage or power;
– rated frequency range;
– reference plane;
– reference point;
– reference axis.

NOTE A full explanation of the term “rated” is given in IEC 60268-2. See also term 151-04-03 in IEC 60050 (151).

3.2.2 Normal measuring conditions
A loudspeaker shall be understood to be working under normal measuring conditions when all the following conditions are fulfilled:

a) the loudspeaker to be measured is mounted in accordance with Clause 10;
b) the acoustical environment is specified and is selected from those specified in Clause 5;
c) the loudspeaker is positioned with respect to the measuring microphone and the walls in accordance with Clause 7;
d) the loudspeaker is supplied with a specified test signal, in accordance with Clause 4, of a stated voltage $U$, within the rated frequency range in accordance with 19.1. If required, the input power $P$ can be calculated from the equation:

$$P = \frac{U^2}{R},$$

where $R$ is the rated impedance in accordance with 16.1;
e) attenuators, if any, are set to their “normal” position as stated by the manufacturer. If other positions are chosen, for example those providing a maximally flat frequency response or maximum attenuation, these shall be specified;
f) measuring equipment suitable for determining the wanted characteristics is connected in accordance with Clause 8.