



**International
Standard**

ISO 23351-2

**Acoustics — Measurement of
speech level reduction of furniture
ensembles and enclosures —**

**Part 2:
Field method**

*Acoustique — Mesurage de la réduction du niveau de parole des
ensembles de meubles et des enceintes —*

Partie 2: Méthode de terrain

**First edition
2026-08**

Sample Document

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Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 43, *Acoustics*, Subcommittee SC 2, *Building acoustics*.

A list of all parts in the ISO 23351 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Furniture ensembles and enclosures are used to improve the acoustic quality of workspaces, e.g. in offices, education spaces, health-care premises, industrial spaces and public interiors.

Furniture ensembles (partial enclosures) are, for example, partially enclosed workstations, sofa groups, and working zones with mobile screens, curtains, or other space dividers.

Enclosures are for example movable one-person phone booths (pods), movable one- or two-person working booths, and demountable or configurable meeting booths for numerous occupants. Enclosures are typically equipped at least with walls, ceiling, door, electric outlets, lighting, glazing, furniture and a ventilation fan. An enclosure can also involve a floor element, but it is not necessary. Some enclosures can also be equipped with air-conditioning systems or openable ceilings due to fire protection reasons.

Both furniture ensembles and enclosures (herein called "test objects") are usually assembled using elements or modules, which can be transferred into any room through normal-sized passage doors. Test objects are typically assembled in a finished room and not during the construction of the building. They are usually purchased by the tenant or lessor, but they can also be leased. They are not considered as fixed parts of the building, and their application does not require a building permit.

Both diversity and the market of the above-mentioned test objects have grown. Where possible, it is recommended to test their acoustic performance according to ISO 23351-1 in laboratory conditions. However, ISO 23351-1 gives an upper limit for the volume of the test object. Therefore, very large test objects cannot be tested by ISO 23351-1. In addition, it would be beneficial to be able to determine the speech level reduction in alternative environments. For example, the manufacturer should be able to conduct a preliminary test in the product development environment, or the user (buyer) should be able to verify by measurement in situ that the declared speech level reduction was fulfilled.

This document provides a method to determine the apparent speech level reduction of above-mentioned test objects in rooms that do not fulfil the requirements of ISO 3741.

The aim of the method is to describe the acoustic performance in such a way that the result is comparable to results obtained in any other room or to the result obtained by ISO 23351-1. The measurement uncertainty of this method is small (engineering grade of accuracy). This way, the test results obtained for different test objects can be reliably compared. This is important for buyers so that they can make product selection reliably. Small measurement uncertainty is only possible by setting high requirements for the placement of the test object in the room during the measurement. As a result, the actual position of the test object in the room may not be acceptable and the test object may need to be moved during the test.

One study^[1] showed that ISO 23351-1 and this document produced similar results for an enclosure and for a partial enclosure.

The aim of this method is not to determine how much the test object mounted in a specific location in the room provides insertion loss to specific positions of the room. While speech level reduction is a constant property of a test object, insertion loss depends on the position of the test object in the room.

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Acoustics — Measurement of speech level reduction of furniture ensembles and enclosures —

Part 2: Field method

1 Scope

This document specifies a method to determine the apparent speech level reduction of furniture ensembles and enclosures (hereinafter referred to as test objects) in field conditions meeting engineering grade of accuracy.

The method is applicable to furniture ensembles or enclosures, which can be used by one or more occupants.

This method is not intended for single components used in workstations, such as a screen, a storage unit, a table, a luminaire, a cupboard, a bookshelf, a standard chair, a wall absorber, or a ceiling absorber.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 3744, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane*

ISO 3382-2, *Acoustics — Measurement of room acoustic parameters — Part 2: Reverberation time in ordinary rooms*

IEC 60942, *Electroacoustics — Sound calibrators*

IEC 61260-1, *Electroacoustics — Octave-band and fractional-octave-band filters — Part 1: Specifications*

IEC 61672-1, *Electroacoustics — Sound level meters — Part 1: Specifications*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1 apparent level reduction

D'_i

frequency-dependent measure describing how much the sound power level is reduced by the test object in 1/1-octave frequency bands from 125 Hz to 8 000 Hz