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

Part 1: Laboratory method

*Acoustique — Mesure de la réduction du niveau de la parole par les
ensembles de meubles et les enceintes —*

Partie 1: Méthode de laboratoire



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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.

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

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Introduction

An increasing number of office occupants are working in open-plan offices and activity-based offices. Occupants attempting to concentrate on independent tasks are easily distracted by surrounding speech. In addition, many communications require speech privacy, which is difficult to achieve in an occupied office without moving to a place providing enhanced sound isolation to the surrounding spaces.

Examples of furniture ensembles are conventional workstations, working pods, meeting pods, partially enclosed sofa groups and partially enclosed chairs. Examples of enclosures are mobile phone booths for a single occupant, mobile working booths for 1 to 2 occupants and mobile meeting booths for up to 6 occupants. Enclosures are usually equipped with a door, electric outlets, lighting, glazing and a ventilation fan.

Both furniture ensembles and enclosures (herein called "product") are assembled on site using elements which can be transferred into any room through normal-sized passage doors. They are not fixtures and they are usually purchased and owned by the user. They are not treated as a fixed part of the building and, therefore, they are beyond the scope of building regulations. Products are typically assembled in a finished room and not during the construction of the building.

The diversity and the market of above-mentioned products has grown. However, present acoustic test standards, such as ISO 354, ISO 11654 or ISO 20189, cannot be applied to describe the acoustic performance of these products because they have a special purpose of providing local enhanced speech privacy for a single occupant or a group of occupants. In addition, the products can be either open, partially enclosed or fully enclosed with a door. Both open and enclosed products should preferably be tested with the same method since the market needs a procedure to compare different products, which are designed for the same purpose. Therefore, the application of existing standards describing sound insulation measurements, such as ISO 10140-2, ISO 16283-1, ISO 10052, ISO 11546-1 or ISO 11957, are not applicable. There are also methods for describing the properties of screens (see ISO 10053, ISO 11821, or ISO 10847) but they are not applicable for describing the acoustic performance of an entire workstation nor an enclosure. The lack of a harmonized test standard which would be suitable for both furniture ensembles and enclosures has caused confusion and frustration among acousticians, furniture manufacturers, office designers and users.

This document provides a method to determine the potential for speech level reduction of furniture ensembles and enclosures which are intended to provide increased speech privacy for an occupant speaking inside the product. The main outcome of this document is a single-number quantity, the speech level reduction. It is tied to standard effort speech because it is the most probable sound produced inside a product. The speech level reduction describes how much the A-weighted sound power level of occupant's speech is reduced when the speaking occupant moves inside the product. The speech level reduction is a standardized technical value which can be used to compare the acoustical effect of different products in regard of their abilities to reduce the A-weighted sound power level of speech. It enables ranking of alternative products.

The level reduction obtained by this document is independent from the environment because it is based on repeated sound power level measurements. However, the reduction of sound pressure level in situ in a specified position can be larger than the level reduction obtained by this method if the room contains large amounts of sound absorption materials and/or screens, or if the openings of the product are oriented to the opposite direction than the position under interest.