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## Acoustics — Measurement of room acoustic parameters —

### Part 3: Open plan offices

*Acoustique — Mesurage des paramètres acoustiques des salles —  
Partie 3: Bureaux ouverts*



Reference number  
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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 3382-3 was prepared by Technical Committee ISO/TC 43, *Acoustics*, Subcommittee SC 2, *Building acoustics*.

ISO 3382 consists of the following parts, under the general title *Acoustics — Measurement of room acoustic parameters*:

- *Part 1: Performance spaces*
- *Part 2: Reverberation time in ordinary rooms*
- *Part 3: Open plan offices*

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## Introduction

The phrase “open plan offices” in the context of this part of ISO 3382 covers offices and similar spaces where a large number of people can work, have a conversation, or concentrate independently in well-defined work stations. In open plan offices, the occupants are affected by activities surrounding them. Insufficient acoustic conditions lead to distraction and a lack of speech privacy. Distraction weakens the ability to concentrate and reduces productivity, especially in tasks requiring cognitive resources. Low speech privacy prevents confidential or partly confidential conversations. Speech can be intrusive for the listener, whereas for the speaker, it can be desirable to avoid involuntary spread of speech of a private nature.

The design of open plan spaces includes careful consideration of the layout of the workstations and mutual arrangement of teams or workgroups. Other factors affecting the acoustical performance of open plan spaces are sound absorption, height of screens and storage units, background noise, degree of workstation enclosure, distance between workstations, and room dimensions. The reverberation time of a room used to be regarded as the predominant indicator of its acoustical properties. However, there is evidence that other types of measurements such as rate of spatial decay of sound pressure levels, speech transmission index and background noise levels are needed for a more complete evaluation. If reverberation time is considered relevant, it should be measured in accordance with ISO 3382-2.

This part of ISO 3382 specifies a measurement method which results in single number quantities indicating the general acoustical performance of open plan offices. The principal aim is good speech privacy between workstations. The measurement method and resulting single number quantities correspond well with perceived acoustic conditions of the worker.

Furniture strongly affects acoustic conditions. Therefore, the measurements are performed only when the room is completely finished, including furniture. Measurement in an unfurnished room does not describe the perceived acoustical conditions. It is also important that the measurements are carried out when people are absent, but with the normal daytime background noise, whether it is caused by ventilation, traffic noise or an artificial masking sound system. If people are present, the background noise level varies strongly with time and the determination of reliable results becomes impossible.

The single number quantities are designed to represent the situation where a single person is talking and the rest are silent. Therefore, the measurements are made by using a single loudspeaker. If many people speak simultaneously, the masking is increased and the degree of distraction gets weaker (see Reference [10]). Therefore, the results describe the most distracting situation. However, this part of ISO 3382 can be used to determine the room acoustic quality of, for example, call centres where many speakers are active continuously. In such cases, the sound environment caused by many simultaneous speakers may cause a positive speech masking effect and the results of this part of ISO 3382 may underestimate the perceived speech privacy.