INTERNATIONAL STANDARD

ISO 22955

First edition
2021-05

Acoustics — Acoustic quality of open office spaces

Acoustique — Qualité acoustique des espaces de bureaux ouverts

Reference number
ISO 22955:2021(E)

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Published in Switzerland

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Foreword

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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 1, *Noise*.

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

Open-plan offices are increasingly common. They can cause apprehension from users due to noise and the difficulty of performing two theoretically contradictory activities in terms of acoustics: oral communication and focused individual work. In this type of space, disturbance caused by speech can result in tension between people who want to concentrate and people who are required to talk to perform their activity.

This document is concerned with the acoustics of open-plan spaces and, more specifically, cognitive effects of noise, i.e. acoustic comfort and noise disturbance linked to the obligations of the activity.

It is intended for stakeholders working in the planning, design, construction or layout of open-plan offices. Its aim is to help them provide users with a good level of acoustic comfort. It is meant as a basis for discussion and dialogue between the stakeholders involved in creating office spaces. In particular, it is intended for project owners to fine-tune the drafting of the acoustic specifications and help project management companies decide upon their objectives and the resources linked to the architecture and layout of open-plan offices.

The aim of this document is to offer principles, descriptors and measurement methods to characterise acoustics, which are easy to use and correspond to the perception of the acoustical environment by the occupants of the spaces.

Studies[3] to [5] have shown that noises that are uncontrollable, intelligible and with no link to the activity of an individual are the most disturbing and shall be minimised. They most often come from adjacent workstations, recreational areas, shared areas or neighbouring offices. For this reason, this document is focused on containing speech propagation.

The approach chosen for open-plan spaces is to limit disturbance between adjacent workstations but also to optimize comfort for short-distance conversations. The underlying idea is that a high level of intelligibility in the area of communication (near to the workstation) results in less disturbance at more distant workstations. This document addresses the issues of noise comfort, in particular via the concepts of "discretion" and "distraction reduction".

This document provides an opportunity to reflect further, by including an analysis of activities that involve more or less collaboration on the one hand, and by addressing everything that constitutes an open-plan space on the other, in particular in terms of surface treatments and additional office layout such as furniture, acoustic screens or low dividers, etc.

This document establishes a link between acoustic quality and the acoustic performance to be achieved in an open office. The principles and descriptors apply to usual situations in terms of acoustic disturbance, privacy and discretion. They also include the working practices inherent to these spaces and the expectations of the organisations that use them regarding productivity and the well-being of employees.

This document reflects the technological and economic context of office construction in relation to both operations in unfurnished offices and resulting layout practices. In addition, this document reflects the expectations of the end users, based on the experience from the members of the commission and publications available at the date the text was drafted.

Acoustics — Acoustic quality of open office spaces

1 Scope

This document provides technical guidance to achieve acoustic quality of open office spaces to support dialogue and formal commitment between the various stakeholders involved in the planning, design, construction or layout of open-plan workspaces: end customers, project owners, prescribers, consultants, etc.

It is applicable to all open-plan offices in which the following activities are performed:

— Space type 1: activity not known yet – vacant floor plate;

— Space type 2: activity mainly focusing on outside of the room communication (by telephone/audio/video);

— Space type 3: activity mainly based on collaboration between people at the nearest workstations;

— Space type 4: activity based on a small amount of collaborative work;

— Space type 5: activity that can involve receiving public;

— Space type 6: combining activities within the same space.

More specifically, this document applies to refitting projects of existing business sites (renovation and/or change or add activities) and layout projects for new spaces and spaces delivered unfurnished.

It covers both the activities and the operations of the following stakeholders:

— end customers: diagnosis, survey, expression of needs in keeping with their knowledge in the area of acoustics;

— project owners: drafting contract specifications;

— project management companies (architects, acousticians, ergonomists, economists and consulting engineers): indicating the performance of acoustic solutions and the layout principles used to achieve the result expressed in the specifications;

— building traders: reaching a clear and verifiable target with respect to the choices of materials and implementation;

— Building developer: promoting indoor environmental quality, including acoustic comfort, in estate operations in order to use it as a competitive element;

— specialists in occupational health, safety and quality;

— expert assessments and consultancy.

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 354, *Acoustics — Measurement of sound absorption in a reverberation room*

ISO 11654, *Acoustics — Sound absorbers for use in buildings — Rating of sound absorption*

