

SLOVENSKI PREDSTANDARD

oSIST prEN ISO 3382-2:2006

junij 2006

Akustika - Merjenje akustičnih parametrov v prostorih - 2. del: Odmevni čas v običajnih prostorih (ISO/DIS 3382 -2:2006)

Acoustics - Measurement of room acoustic parameters - Part 2: Reverberation time in ordinary rooms (ISO/DIS 3382-2:2006)

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ICS 91.120.20

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March 2006

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Will supersede EN ISO 3382:2000

English Version

Acoustics - Measurement of room acoustic parameters - Part 2: Reverberation time in ordinary rooms (ISO/DIS 3382-2:2006)

Acoustique - Mesurage des paramètres acoustiques des
salles - Partie 2: Durée de réverbération des salles
ordinaires (ISO/DIS 3382-2:2006)

Akustik - Messung von Parametern der Raumakustik - Teil
2: Nachhallzeit in gewöhnlichen Räumen (ISO/DIS 3382-
2:2006)

This draft European Standard is submitted to CEN members for parallel enquiry. It has been drawn up by the Technical Committee CEN/TC 126.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (prEN ISO 3382-2:2006) has been prepared by Technical Committee ISO/TC 43 "Acoustics" in collaboration with Technical Committee CEN/TC 126 "Acoustic properties of building elements and of buildings", the secretariat of which is held by AFNOR.

This document is currently submitted to the parallel Enquiry.

This document will supersede EN ISO 3382:2000.

Endorsement notice

The text of ISO 3382-2:2006 has been approved by CEN as prEN ISO 3382-2:2006 without any modifications.

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DRAFT INTERNATIONAL STANDARD ISO/DIS 3382-2

ISO/TC 43/SC 2

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Acoustics — Measurement of room acoustic parameters — Part 2: Reverberation time in ordinary rooms

Acoustique — Mesurage des paramètres acoustiques des salles —

Partie 2: Durée de réverbération des salles ordinaires

ICS 91.120.20

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The CEN Secretary-General has advised the ISO Secretary-General that this ISO/DIS covers a subject of interest to European standardization. **In accordance with the ISO-lead mode of collaboration as defined in the Vienna Agreement, consultation on this ISO/DIS has the same effect for CEN members as would a CEN enquiry on a draft European Standard.** Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month FDIS vote in ISO and formal vote in CEN.

In accordance with the provisions of Council Resolution 15/1993 this document is circulated in the English language only.

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Foreword

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

It has been agreed with the Technical Committee ISO/TC 43, *Acoustics*, Subcommittee SC 2, *Building acoustics* that this document should form a new Part 2 of ISO 3382. The existing International Standard ISO 3382:1997, *Acoustics – Measurement of the reverberation time of rooms with reference to other acoustical parameters* should be made Part 1. In this way it will be clear that the two standards are closely related but that they cover different applications. Part 1 contains the technical details of the measurement technique and the information for room acoustic measurements in performance spaces, including the measurement of other room acoustic parameters. Part 2 will not repeat the technical details of Part 1, but it deals with the measurement of reverberation time, only, in any kind of room.

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

- *Part 1: Performance rooms;*
- *Part 2: Reverberation time in ordinary rooms.*

The Annexes A, B and C are for information only.

Introduction

The reverberation time is important in many kinds of rooms and there are several purposes for measuring the reverberation time. The sound pressure level from noise sources, the intelligibility of speech and the privacy in a room are strongly dependent on the reverberation time. Examples of relevant rooms are living rooms, stairways, workshops, industrial halls, classrooms, offices, restaurants, exhibition areas, sports halls and railway and airport terminals. Another reason for measuring the reverberation time is for the correction term for room absorption inherent in many acoustic measurements. Examples of this are sound insulation measurements according to the ISO 140 series and sound power measurements according to the ISO 3740 series.

In some countries building codes specify the required reverberation times in classrooms and other categories of room. However, in the vast majority of rooms it is left for the design team to specify and design for a reverberation time that is reasonable for the purpose of a room. It is the hope that the present standard may contribute to the general understanding and acceptance of the importance of reverberation time for the quality and usability of rooms.

The standard specifies three levels of measurement accuracy: survey, engineering and precision. The main difference concerns the number of measurement positions and thus the time required for the measurements. Annex A contains some additional information about the measurement uncertainty of the reverberation time. By introducing the option of a survey measurement it is the hope that reverberation time will be measured more often in rooms where it is relevant. It seems obvious that even a very simple measurement is much better than no measurement.

Two different evaluation ranges are defined in the standard, 20 dB and 30 dB. However, a preference has been given to the 20 dB evaluation range for several reasons:

- The subjective evaluation of reverberation is related to the early part of the decay.
- For the estimation of the steady state sound level in a room from its reverberation time, it is appropriate to use the early part of the decay.
- The signal-to-noise ratio is often a problem in field measurements, and it is often difficult or impossible to get a evaluation range of more than 20 dB. This requires a signal-to-noise level of at least 35 dB.

The traditional measuring technique is based on visual inspection of every single decay curve. With modern measuring equipment the decay curves are normally not displayed and this may introduce a risk that abnormal decay curves are used for the determination of the reverberation time. For this reason Annex B introduces two new measures that quantify the degree of non-linearity and the degree of curvature of the decay curve. These measures may be used to give warnings when the decay curve is not linear, and consequently the result should be dismissed or marked as less reliable.

The use of rotating microphones during the measurement of decay curves has been considered by the working group, and this procedure is found to be without a clear physical meaning and thus it is not accepted in this standard.

Two other standards for reverberation time measurement already exist: ISO 3382 for auditoriums and performance spaces and ISO 354 for absorption coefficient measurements in a reverberation room. Neither of these standards is suited for measurements in rooms like those mentioned above. Thus the present standard is assumed to fill a gap among the measuring standards for acoustic properties of buildings.

