



**NSAI**  
Standards

Irish Standard  
I.S. EN ISO 8253-1:2010

# Acoustics - Audiometric test methods - Part 1: Pure-tone air and bone conduction audiometry (ISO 8253-1:2010)

## I.S. EN ISO 8253-1:2010

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard – national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation - recommendation based on the consensus of an expert panel and subject to public consultation.

SWIFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

*This document replaces:*  
EN 26189:1991, EN ISO 8253-1:1998

<i>This document is based on:</i> EN ISO 8253-1:2010	<i>Published:</i> 15 November, 2010
---	--

This document was published under the authority of the NSAI and comes into effect on: 15 November, 2010

ICS number:  
13.140

**NSAI**  
1 Swift Square,  
Northwood, Santry  
Dublin 9

T +353 1 807 3800  
F +353 1 807 3838  
E standards@nsai.ie  
W NSAI.ie

**Sales:**  
T +353 1 857 6730  
F +353 1 857 6729  
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

English Version

## Acoustics - Audiometric test methods - Part 1: Pure-tone air and bone conduction audiometry (ISO 8253-1:2010)

Acoustique - Méthodes d'essais audiométriques - Partie 1:  
Audiométrie à sons purs en conduction aérienne et en  
conduction osseuse (ISO 8253-1:2010)

Akustik - Audiometrische Prüfverfahren - Teil 1:  
Grundlegende Verfahren der Luft- und Knochenleitungs-  
Schwellenaudiometrie mit reinen Tönen (ISO 8253-1:2010)

This European Standard was approved by CEN on 25 September 2010.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

**Contents**

Page

**Foreword.....3**

## **Foreword**

This document (EN ISO 8253-1:2010) has been prepared by Technical Committee ISO/TC 43 “Acoustics” in collaboration with Technical Committee CEN/TC 211 “Acoustics” the secretariat of which is held by DS.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2011, and conflicting national standards shall be withdrawn at the latest by May 2011.

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

This document supersedes EN 26189:1991 and EN ISO 8253-1:1998.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

### **Endorsement notice**

The text of ISO 8253-1:2010 has been approved by CEN as a EN ISO 8253-1:2010 without any modification.

*This page is intentionally left BLANK.*

I.S. EN ISO 8253-1:2010  
**INTERNATIONAL  
STANDARD**

**ISO  
8253-1**

Second edition  
2010-11-01

---

---

**Acoustics — Audiometric test methods —**

Part 1:  
**Pure-tone air and bone conduction  
audiometry**

*Acoustique — Méthodes d'essais audiométriques —*

*Partie 1: Audiométrie à sons purs en conduction aérienne et en  
conduction osseuse*



Reference number  
ISO 8253-1:2010(E)

© ISO 2010

**PDF disclaimer**

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2010

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.org](mailto:copyright@iso.org)  
Web [www.iso.org](http://www.iso.org)

Published in Switzerland



## Contents

Page

Foreword .....	v
Introduction.....	vi
1 Scope .....	1
2 Normative references .....	1
3 Terms and definitions .....	2
4 General aspects of audiometric measurements .....	4
4.1 General .....	4
4.2 Standard reference zero for the calibration of audiometric equipment .....	5
4.3 Requirements on audiometric equipment .....	5
4.4 Qualified tester .....	5
4.5 Test time .....	5
4.6 Conditions for audiometric test environments .....	5
4.7 Measurement uncertainty .....	6
5 Preparation and instruction of test subjects before audiometric testing and positioning of transducers .....	6
5.1 Preparation of test subjects .....	6
5.2 Instruction of test subjects.....	7
5.3 Placement of transducers .....	7
6 Air conduction hearing threshold level determinations using fixed-frequency audiometry .....	7
6.1 General .....	7
6.2 Manually controlled threshold determination .....	8
6.3 Hearing threshold determination with an automatic recording audiometer .....	10
6.4 Computer-controlled threshold determination.....	12
7 Air conduction hearing threshold level determinations using sweep-frequency audiometry .....	12
7.1 General .....	12
7.2 Presentation of test tone .....	12
7.3 Familiarization .....	12
7.4 Hearing threshold level measurement .....	12
7.5 Calculation of hearing threshold level at a specified frequency.....	12
8 Bone conduction hearing threshold audiometry .....	13
8.1 Method of audiometry .....	13
8.2 Occlusion .....	13
8.3 Airborne sound radiation from the bone vibrator .....	13
8.4 Vibrotactile sensation .....	13
8.5 Procedures for testing with masking in bone conduction audiometry .....	13
9 Screening audiometry.....	14
9.1 General .....	14
9.2 Procedure for the screening test .....	14
10 Audiograms.....	15
11 Permissible ambient noise .....	16
11.1 Permissible ambient noise for threshold determinations.....	16
11.2 Psycho-acoustic check on ambient noise .....	16
12 Maintenance and calibration of audiometric equipment.....	20
12.1 General .....	20
12.2 Intervals between checks .....	20

**I.S. EN ISO 8253-1:2010**

**ISO 8253-1:2010(E)**

<b>12.3</b>	<b>Stage A — Routine checking and subjective tests .....</b>	<b>20</b>
<b>12.4</b>	<b>Stage B — Periodic objective checks.....</b>	<b>21</b>
<b>12.5</b>	<b>Stage C — Basic calibration tests.....</b>	<b>22</b>
<b>Annex A</b>	<b>(informative) Measurement uncertainty .....</b>	<b>23</b>
<b>Bibliography</b>	<b>.....</b>	<b>28</b>

## 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 8253-1 was prepared by Technical Committee ISO/TC 43, *Acoustics*.

This second edition cancels and replaces the first edition (ISO 8253-1:1989) and ISO 6189:1983, which have been technically revised.

ISO 8253 consists of the following parts, under the general title *Acoustics — Audiometric test methods*:

- *Part 1: Pure-tone air and bone conduction audiometry*
- *Part 2: Sound field audiometry with pure-tone and narrow-band test signals*
- *Part 3: Speech audiometry*

## Introduction

This International Standard specifies requirements and procedures for carrying out basic audiometric tests in which pure tones are presented to the test subject using earphones or bone vibrators. Electrophysiological test methods are not included.

In order to obtain a reliable measure of hearing ability, many factors are involved. IEC 60645-1 specifies requirements for audiometers. It is essential that audiometric equipment, when in service, be checked and the calibration maintained. This part of ISO 8253 outlines a calibration scheme. To avoid masking of the test signal by ambient noise in the audiometric test room, the levels of the ambient noise shall not exceed certain values, depending upon the method of signal presentation to the test subject, i.e. by different earphones or by bone vibrator. This part of ISO 8253 gives maximum permissible ambient sound pressure levels which shall not be exceeded when hearing threshold levels down to 0 dB have to be measured. It indicates the maximum ambient sound pressure levels which are permissible when other minimum hearing threshold levels require measurement. It sets out procedures for determining hearing threshold levels by pure-tone air conduction and bone conduction audiometry. For screening purposes, only methods for air conduction audiometry are outlined.

Audiometry can be performed by using:

- a) a manual audiometer;
- b) an automatic recording audiometer;
- c) computer-controlled audiometric equipment.

Methods for threshold audiometry are given for these three types of signal presentation. For screening purposes, only methods using a manual or a computer-controlled audiometer are set out. The procedures are applicable to the majority of adults and children. Other procedures may yield results equivalent to those derived by the procedures specified in this part of ISO 8253. For very young, aged or sick people, some modification of the recommended procedures is likely to be required. This may result in a less accurate measurement of hearing.

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

- 
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
  - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-