



NSAI
Standards

Irish Standard
I.S. EN 62458:2011

Sound system equipment -
Electroacoustic transducers -
Measurement of large signal
parameters (IEC 62458:2010 (EQV))

© NSAI 2011 No copying without NSAI permission except as permitted by copyright law.

I.S. EN 62458:2011

Incorporating amendments/corrigenda 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.

<i>This document replaces:</i>	<i>This document is based on:</i> EN 62458:2011	<i>Published:</i> 25 March, 2011
This document was published under the authority of the NSAI and comes into effect on: 5 April, 2011		ICS number: 33.160.50
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		

EUROPEAN STANDARD

EN 62458

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2011

ICS 33.160.50

English version

**Sound system equipment -
Electroacoustic transducers -
Measurement of large signal parameters
(IEC 62458:2010)**

Equipements pour systèmes
électroacoustiques -
Transducteurs électroacoustiques -
Mesure des paramètres en grand signal
(CEI 62458:2010)

Elektroakustische Geräte -
Elektroakustische Wandler -
Messung von Großsignal-Parametern
(IEC 62458:2010)

This European Standard was approved by CENELEC on 2011-01-02. CENELEC 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 Central Secretariat or to any CENELEC 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 CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 100/1624/FDIS, future edition 1 of IEC 62458, prepared by IEC/TC 100, Audio, video and multimedia systems and equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62458 on 2011-01-02.

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

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2011-10-02
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2014-01-02

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62458:2010 was approved by CENELEC as a European Standard without any modification.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60268-1	-	Sound system equipment - Part 1: General	HD 483.1 S2	-
IEC 60268-5 A1	2003 2007	Sound system equipment - Part 5: Loudspeakers	EN 60268-5 A1	2003 2009

This page is intentionally left BLANK.

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references.....	7
3 Terms and definitions.....	7
4 Test signals.....	9
4.1 General.....	9
4.2 Large d.c. signal.....	9
4.3 Large d.c. signal and small a.c. signal.....	9
4.4 Broadband noise signal.....	9
4.5 Music.....	9
5 Mounting condition.....	10
5.1 Drive units.....	10
5.2 Loudspeaker systems.....	10
6 Climatic conditions.....	10
7 Acoustical environment.....	10
8 Preconditioning.....	10
9 Time-varying properties of the loudspeaker.....	11
10 Methods of measurement.....	11
10.1 General.....	11
10.2 Static or quasi-static method.....	11
10.3 Point-by-point dynamic method.....	12
10.4 Full dynamic method.....	14
11 Nonlinear force factor.....	15
11.1 Force factor curve $Bl(x)$	15
11.2 Force-factor limited displacement, X_{Bl}	16
11.3 Symmetry point, $x_{\text{sym}}(x_{\text{ac}})$	17
11.4 Voice coil offset, x_{offset}	18
12 Nonlinear stiffness.....	18
12.1 Nonlinear stiffness curve $K_{\text{ms}}(x)$	18
12.2 Compliance-limited displacement x_c	19
12.3 Stiffness asymmetry $A_K(x_{\text{peak}})$	19
13 Displacement-dependent inductance, $L_e(x)$	20
13.1 Inductance curve $L_e(x)$	20
13.2 Inductance-limited displacement, x_L	21
14 Current -dependent inductance, $L_e(i)$	21
14.1 Characteristic to be specified.....	21
14.2 Method of measurement.....	21
15 Parameters derived from geometry and performance.....	22
15.1 Maximal peak displacement, x_{MAXd}	22
15.2 Method of measurement.....	22
Bibliography.....	23
Figure 1 – Electro-dynamical transducer.....	7

Figure 2 –Static and quasi-static measurement setup 12

Figure 3 – Setup for measurement of large signal parameters by using the point-by-point dynamic method 13

Figure 4 – Setup for dynamic measurement of large signal parameters..... 14

Figure 5 – Reading the maximal peak displacement x_B limited by force factor only 16

Figure 6 – Reading the voice coil offset from the symmetry point $x_{sym}(x_{ac})$ curve 17

Figure 7 – Definition of the symmetry point x_{sym} in the nonlinear force factor characteristic $Bl(x)$ 18

Figure 8 – Reading the stiffness asymmetry from the $K_{ms}(x)$ curve 20

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**SOUND SYSTEM EQUIPMENT –
ELECTROACOUSTICAL TRANSDUCERS –
MEASUREMENT OF LARGE SIGNAL PARAMETERS**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62458 has been prepared by IEC technical committee 100: Audio, video and multimedia systems and equipment.

This first edition cancels and replaces IEC/PAS 62458 published in 2006. It constitutes a technical revision. The main changes are listed below:

- descriptions of the methods of measurement are adjusted to the state of the technology;
- addition of Clauses 4 to 15;
- integration of Annex A in the main body of the standard;
- overall textual review.

The text of this standard is based on the following documents:

FDIS	Report on voting
100/1624/FDIS	100/1647/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

IMPORTANT – The “colour inside” logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this publication using a colour printer.

INTRODUCTION

Electro-mechanical-acoustical transducers such as loudspeaker drive units, loudspeaker systems, headphones, micro-speakers, shakers, and other actuators behave in a nonlinear manner at higher amplitudes. This limits the acoustical output and generates nonlinear signal distortion. Linear models fail in describing the large signal behaviour of such transducers and extended models have been developed which consider dominant nonlinearities in the motor and suspension. The free parameters of the large signal model have to be measured on the particular transducer by using static or dynamic methods. The large signal parameters show the physical cause of the signal distortion directly and are very important for the objective assessment of sound quality and failure diagnostics in development and manufacturing. Furthermore, the model and parameters identified for a particular transducer are the basis for predicting the maximum output and signal distortion for any input signal. The close relationship between causes and symptoms simplifies the interpretation of the harmonic and intermodulation distortion measured according to IEC 60268-5. Large signal parameters are valuable input data for the synthesis of loudspeaker systems and the development of electrical control systems dedicated to loudspeakers.

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

I.S. EN 62458 : 2011 : EN : COMBINED PDF

- ⤵ Looking for additional Standards? Visit SAI Global Infostore
- ⤵ Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation

Need to speak with a Customer Service Representative - Contact Us