IEC 60645-3

Edition 3.0 2020-09

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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Electroacoustics – Audiometric equipment – Part 3: Test signals of short duration

Électroacoustique – Appareils audiométriques – Partie 3: Signaux d'essai de courte durée

IEC 60645-3:2020-09(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTROACOUSTICS – AUDIOMETRIC EQUIPMENT –

Part 3: Test signals of short duration

FOREWORD

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International Standard IEC 60645-3 has been prepared by IEC technical committee 29: Electroacoustics.

This third edition cancels and replaces the second edition published in 2007. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) new figures of reference signals;
b) changes in definitions.

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The text of this International Standard is based on the following documents:

FDIS	Report on voting
29/1066/FDIS	29/1070/RVD

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

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

A list of all parts of IEC 60645 series, under the general title *Electroacoustics – Audiometric equipment*, can be found on the IEC website.

The committee has decided that the contents of this document 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 document will be

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- withdrawn;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

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INTRODUCTION

Developments in the field of hearing measurements for diagnostic, hearing conservation and rehabilitation purposes have resulted in the availability of a wide range of audiometric equipment. In addition, it is possible to consider audiometric equipment in terms of a set of functional units that can be specified independently. By specifying these functional units, it is then possible to specify the performance of other audiometric equipment that uses these units. The IEC 60645 series consists of a number of parts. IEC 60645-3 covers the requirements for reference and other test signals of short duration.

Examples of test methods, where such signals are commonly used, are the recording of auditory evoked potentials and evoked otoacoustic emissions. Reference signals are described in order to provide a basis for calibration and as a recommendation for use when there is no specific reason to have an alternative signal. Measurement methods for short duration acoustic and vibratory test signals are described.

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ELECTROACOUSTICS – AUDIOMETRIC EQUIPMENT –

Part 3: Test signals of short duration

1 Scope

This part of IEC 60645 specifies a means of describing the physical characteristics, in terms of electrical waveforms, of audiometric reference and test signals of short duration and methods for their measurement.

The object of this document is to ensure that audiometric stimuli of short duration are specified and measured in the same way and that the calibration of equipment using such signals is carried out using defined methods.

This document does not describe the method of use of short-duration test signals.

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.

IEC 60318-1, *Electroacoustics – Simulators of human head and ear – Part 1: Ear simulator for the measurement of supra-aural and circumaural earphones*

IEC 60318-3, *Electroacoustics – Simulators of human head and ear – Part 3: Acoustic coupler for the calibration of supra-aural earphones used in audiometry*

IEC 60318-4, *Electroacoustics – Simulators of human head and ear – Part 4: Occluded-ear simulator for the measurement of earphones coupled to the ear by means of ear inserts*

IEC 60318-5, *Electroacoustics – Simulators of human head and ear – Part 5: 2 cm^3 coupler for the measurement of hearing aids and earphones coupled to the ear by means of ear inserts*

IEC 60318-6, *Electroacoustics – Simulators of human head and ear – Part 6: Mechanical coupler for the measurement on bone vibrators*

IEC 61260-1, *Electroacoustics – Octave-band and fractional-octave-band filters – Part 1: Specifications*

ISO 389-6, *Acoustics – Reference zero for the calibration of audiometric equipment – Part 6: Reference threshold of hearing for test signals of short duration*

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3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

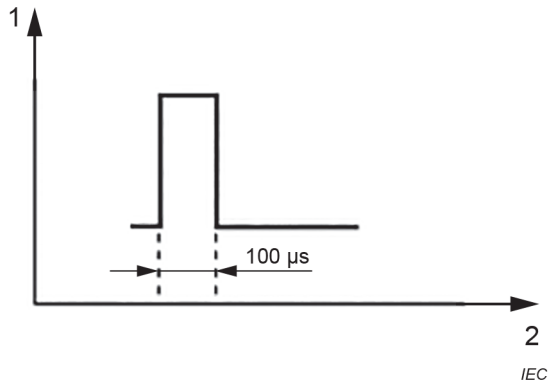
ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
short-duration signal
signal having a duration of less than 200 ms

3.2
click
transient acoustic or vibratory signal whose frequency spectrum covers a broad frequency range, produced by applying a single rectangular electrical pulse to the terminals of the transducer

Note 1 to entry: See Figure 1 and Figure 2.



Key

1 level

2 time

Figure 1 – Basic specification of an electrical reference click

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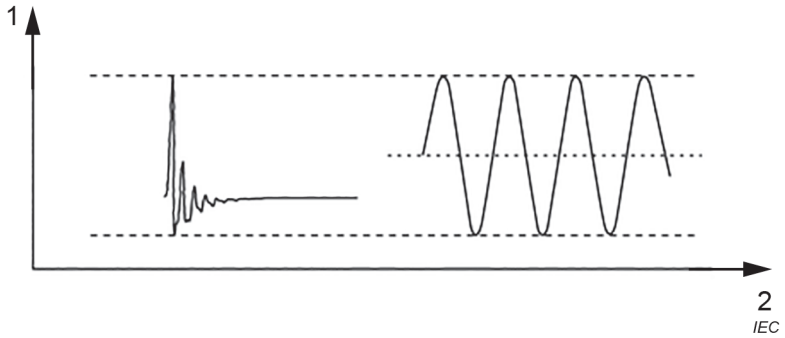


Key

1 level

2 time

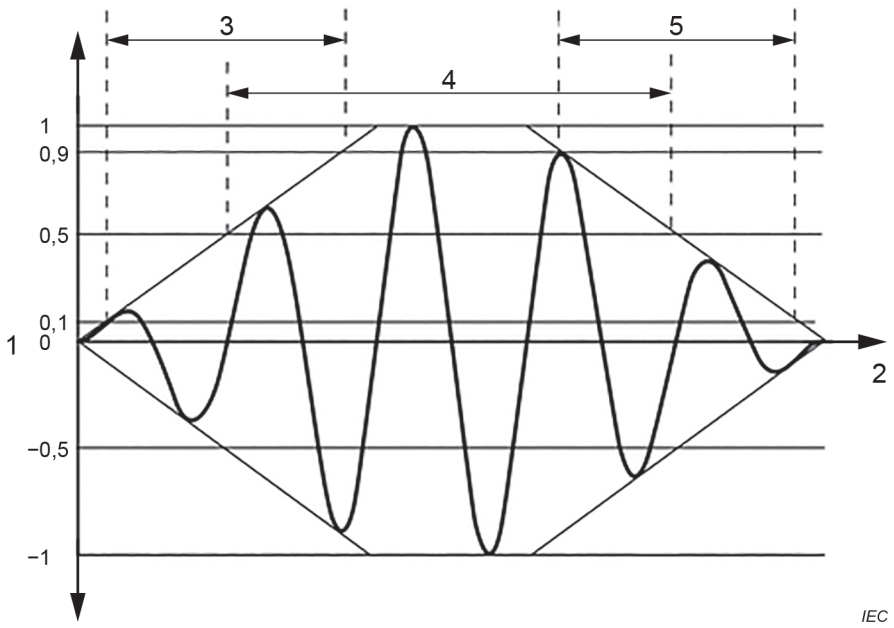
NOTE The left part of the figure shows an example of the acoustic click signal generated by an electrical rectangular pulse applied to a transducer (100 µs electrical pulse fed to a TDH-39 earphone with MX-41/AR cushion and measured on an IEC 60318-1 ear simulator) and the right part presents the long duration sinusoidal signal.

Figure 2 – Illustration of the method of measurement of peak-to-peak equivalent signal levels

3.3
tone-burst
gated sinusoidal signal having a duration of less than 200 ms

Note 1 to entry: Figure 3 shows a reference tone-burst (see 4.3).

Note 2 to entry: A tone-burst is sometimes called a "brief tone" or a "tone pip".



Key

1 level

2 time

3 rise time

4 duration

5 fall time

Figure 3 – Temporal characteristics of an electrical reference tone-burst

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