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ISO/TC 43/SC 1

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Acoustics — Test methods for the qualification of the acoustic environment —

Part 2:
Determination of the environmental correction

Acoustique — Méthodes d'essai pour la qualification de l'environnement acoustique —

Partie 2: Détermination de la correction d'environnement

FDIS stage

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A list of all parts in the ISO 26101 series can be found on the ISO website.

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Introduction

This document is one of the series ISO 26101, which specify various methods for qualifying the acoustic environment. The methods specified in this document permit the qualification of an acoustic environment that approximates to an acoustic free field near one or more reflecting planes. In other words, an acoustic environment in which the effect of reflected sound on sound pressure level measurements is sufficiently small, so that it can be corrected for with the so-called environmental correction ~~K_2~~ ~~K_2~~ K_2. K_2 can be needed to determine the sound power level, see e.g. ISO 3744 or ISO 3746,~~[2]~~[2], or the emission sound pressure level, see e.g. ISO 11201,~~[5]~~[5], ISO 11202~~[6]~~[6] and ISO 11204~~[7]~~[7].

It is expected that the qualification procedures outlined in this document will be referred to by other International Standards and industry test codes. In such cases, these documents making reference to this document can specify qualification criteria based on the environmental correction ~~K_2~~ K_2 determined according to this document.

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Acoustics — Test methods for the qualification of the acoustic environment —

Part 2: Determination of the environmental correction

1 Scope

This document specifies methods for qualifying an environment that approximates to an acoustic free field near one or more reflecting planes. The goal of the qualification is to determine the environmental correction K_2, which is used to correct for reflected sound when determining the sound power level or sound energy level of a noise source from sound pressure levels measured on a surface enveloping the noise source (machinery or equipment) in such an environment.

In practice, the K_2 value determined will be a function of both the reflected sound from the test environment and the shape and size of the measurement surface used for the K_2 determination. For the purposes of this document and the documents that refer to it, the differences between K_2 values determined with different measurement surfaces are assumed to be included in the stated measurement uncertainty for the test method.

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 3744:—[2], Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane

ISO 3745:2012, Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Precision methods for anechoic rooms and hemi-anechoic rooms

ISO 6926, Acoustics — Requirements for the performance and calibration of reference sound sources used for the determination of sound power levels

ISO 26101-1, Acoustics — Test methods for the qualification of the acoustic environment — Part 1: Qualification of free-field environments

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 3744 and the following apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

[1] Under preparation. Stage at the time of the ballot: ISO/FDIS 3744:2024

[2] Under preparation. Stage at the time of the ballot: ISO/FDIS 3744:2024.

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— ——IEC Electropedia: available at ~~https://www.electropedia.org/~~https://www.electropedia.org/

3.1
reverberation time
~~*T*~~
T
(room acoustic parameters) duration required for the space-averaged sound energy density in an enclosure to decrease by 60 dB after the source emission has stopped

Note 1 to entry: The reverberation time is expressed in seconds.

Note 2 to entry: ~~*T* can~~ *T* can be evaluated based on a smaller dynamic range than 60 dB and extrapolated to a decay time of 60 dB. It is then labelled accordingly. Thus, if ~~*T* is~~*T* is derived from the time at which the decay curve first reaches 5 dB and 25 dB below the initial level, it is labelled ~~T_{20}~~ T_{20}. If decay values of 5 dB to 35 dB below the initial level are used, it is labelled ~~T_{30}~~ T_{30}.

[SOURCE: ISO 3382-2:2008~~,[1]~~[1], 3.5]

3.2
measurement surface
hypothetical surface of area, ~~*S*~~ S, on which the microphone positions are located at which the sound pressure levels are measured, enveloping the noise source under test and terminating on the reflecting plane(s) on which the source is located

[SOURCE: ISO 3744~~:2024~~:—, 3.13]

3.3
environmental correction
~~K_2~~
K_2
correction applied to the mean (energy average) sound pressure levels over all the microphone positions on the *measurement surface* ~~(3.2)~~,(3.2), to account for the influence of reflected or absorbed sound

Note 1 to entry: Environmental correction is expressed in decibels.

Note 2 to entry: The environmental correction is frequency dependent; the correction in the case of a frequency band is denoted ~~K_{2f}~~ K_{2f}, where ~~*f*~~ f denotes the relevant mid-band frequency, and that in the case of overall A-weighting is denoted ~~K_{2A}~~ K_{2A}, which is determined from A-weighted sound pressure level measurements.

Note 3 to entry: In general, the environmental correction depends on the area of the measurement surface and usually ~~K_2~~ K_2 increases with ~~S~~ S.

[SOURCE: ISO 3744~~:2024~~:—, 3.16, modified "determined as described in ~~Annex A~~Annex A or in ISO 26101-2:—" and "Note 4 to entry" have been omitted.]

3.4
sound absorption coefficient
~~α~~
α
at a given frequency and for specified conditions, the relative fraction of sound power incident upon a surface which is not reflected

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ISO 3744:2010, Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane
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