Acoustics — Description and measurement of environmental noise — Part 1: Basic quantities and procedures

Acoustique — Caractérisation et mesurage du bruit de l'environnement — Partie 1 : Grandeurs et méthodes fondamentales

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 1996/1 was developed by Technical Committee ISO/TC 43, Acoustics, and was circulated to the member bodies in November 1980.

It has been approved by the member bodies of the following countries:

- Australia
- Austria
- Belgium
- Canada
- China
- Czechoslovakia
- Denmark
- Finland
- France
- Germany, F. R.
- Greece
- Hungary
- India
- Ireland
- Israel
- Italy
- Japan
- Netherlands
- New Zealand
- Norway
- Romania
- South Africa, Rep. of
- Spain
- Sweden
- Switzerland
- United Kingdom
- USSR

The member body of the following country expressed disapproval of the document on technical grounds:

USA

This International Standard cancels and replaces ISO Recommendation R 1996-1971, of which it constitutes a technical revision.

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0 Introduction

This International Standard is the first in a series of documents replacing ISO Recommendation R 1996, Acoustics — Assessment of noise with respect to community response. The present list of parts of ISO 1996 is as follows:

Part 1: Basic quantities and procedures;
Part 2: Acquisition of data pertinent to land use;
Part 3: Application to noise limits.

Extensive research concerning the way in which human beings are affected by noise from a single kind of source such as rail or road vehicles, aircraft or industrial plants, has led to a variety of measures for assessment of different kinds of noise, many of which are in common use. Conversion from one measure to another is often beset with serious uncertainty.

If an acoustical environment were always dominated by a single kind of noise, the confusion caused by the existence of different measures would not be so severe. But often environmental noise is a composite of the sounds from many sources, and the distribution of the different kinds of noise is likely to change from moment to moment. The methods and procedures described in this International Standard are intended to be applicable to sounds from all sources, individually and in combination, which contribute to the total noise at a site. At the present stage of technology this requirement seems to be best met by adopting the equivalent continuous A-weighted sound pressure level as a basic quantity. Results shall always be expressed in terms of this quantity even if supplemented by corrections or other descriptors that, in certain cases, may be deemed appropriate.

The aim of the ISO 1996 series is to provide authorities with material for the description of noise in community environments. Based on the principles described in this International Standard, acceptable limits of noise can be specified and compliance with these limits can be controlled.

This International Standard does not specify limits for environmental noise.

1 Scope and field of application

This part of ISO 1996 defines the basic quantities to be used for the description of noise in community environments and describes basic procedures for the determination of these quantities.

This International Standard forms the basis for further parts in the ISO 1996 series.

2 References

ISO 1999, Acoustics — Determination of occupational noise exposure and estimation of noise-induced hearing impairment.\(^1\)
ISO 3891, Acoustics — Procedure for describing aircraft noise heard on the ground.
IEC Publication 651, Sound level meters.
IEC Publication 804, Integrating-averaging sound level meters.

3 Definitions

For the purpose of this International Standard and other parts in the series the following definitions apply:

3.1 A-weighted sound pressure, in pascals: The root mean square sound pressure determined by use of frequency-weighting network “A” (see IEC Publication 651).

3.2 sound pressure level, in decibels: The sound pressure level is given by the formula

\[ L_p = 10 \log \left( \frac{p}{p_0} \right)^2 \]

where
- \( p \) is the root mean square sound pressure, in pascals;
- \( p_0 \) is the reference sound pressure (20 \( \mu \text{Pa} \)).

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\(^1\) At present at the stage of draft. (Revision of ISO 1999-1976.)