

Description and measurement of environmental noise —

Part 1: Guide to quantities and procedures

ICS 13.140; 17.140.01

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by Technical Committee EH/1, Acoustics, to Subcommittee EH/1/3, Residential and industrial noise, upon which the following bodies were represented:

- Association of Noise Consultants
- Association of Professional Clay Target Shooting Grounds
- BRE – Building Research Establishment
- British Association for Shooting and Conservation
- British Measurement and Testing Association
- British Metals Federation
- British Occupational Hygiene Society
- Chartered Institute of Environmental Health
- Directorate of Airspace Policy
- Electricity Association
- HSE – Health and Safety Executive
- Institute of Acoustics
- Institute of Sound and Vibration Research
- MoD – UK Defence Standardization
- National Rifle Association
- Office of the Deputy Prime Minister (ODPM) – represented by BRE
- Open University
- Society of Environmental Engineers
- UK Steel Association
- University of Bradford
- University of Salford

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Foreword

This part of BS 7445 has been prepared by Subcommittee EH/1/3. It supersedes BS 7445-1:1991 (dual numbered ISO 1996-1:1982), which is withdrawn.

This new edition of BS 7445-1 does not reflect a full review or revision of the standard, which will be undertaken in due course.

The previous edition of BS 7445-1 (1991) was identical with ISO 1996-1:1982 published by the International Organization for Standardization (ISO). Following an extended period of international consultation Subcommittee 1, Noise, of ISO Technical Committee 43, Acoustics, prepared a revised version of ISO 1996-1. The UK and France voted against the adoption of the revised version as an ISO standard. The main reasons given for the negative votes included the fact that few, if any, of the innovations introduced in the revised standard could be supported by existing scientific or technical evidence. In addition, UK Subcommittee EH/1/3 had serious concerns over some of the definitions introduced in the revised ISO 1996-1.

UK Subcommittee EH/1/3, therefore, decided to re-issue the previous version of BS 7445-1 (dual numbered ISO 1996-1) as a new edition (BS 7445-1:2003) without making any changes to the technical content to distinguish it from the revised version of ISO 1996-1 published in 2003.

BS 7445 comprises the following parts:

- *Part 1: Guide to quantities and procedures;*
- *Part 2: Guide to the acquisition of data pertinent to land use* (identical with ISO 1996-2:1987);
- *Part 3: Guide to application to noise limits* (identical with ISO 1996-3:1987).

BS 7445-2 and -3 will be reviewed at such time that any revised versions of the identical ISO standards are published.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.

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Introduction

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 British 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 are always 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 BS 7445 series is to provide authorities with material for the description of noise in community environments. Based on the principles described in this British Standard, acceptable limits of noise can be specified and compliance with these limits can be controlled.

This British Standard does not specify limits for environmental noise.

1 Scope

This part of BS 7445 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 British Standard forms the basis for further parts in the BS 7445 series.

2 References

BS 5727 (ISO 3891), *Method for describing aircraft noise heard on the ground* [ISO 3981].

BS 7445-2 (ISO 1996-2), *Description and measurement of environmental noise — Part 2: Guide to the acquisition of data pertinent to land use*.

BS EN 61672-1, *Electroacoustics — Sound level meters — Part 1: Specifications*.

BS EN 61672-2, *Electroacoustics — Sound level meters — Part 2: Pattern evaluation tests*.

ISO 1999, *Acoustics — Determination of occupational noise exposure and estimation of noise-induced hearing impairment*.

3 Definitions

For the purpose of this British Standard and other parts in the series the following definitions apply.

3.1

A-weighted sound pressure, in pascals

root mean square sound pressure determined by use of frequency-weighting network “A” (see BS EN 61672)

3.2

sound pressure level, in decibels

sound pressure level is given by the formula

$$L_p = 10 \lg \left(\frac{p}{p_0} \right)^2$$

where

p is the root mean square sound pressure, in pascals (Pa);

p_0 is the reference sound pressure (20 μ Pa)