

Acoustics — Noise control design procedures for open plant

ICS 17.140.20

National foreword

This British Standard reproduces verbatim ISO 15664:2001 and implements it as the UK national standard.

The UK participation in its preparation was entrusted to Technical Committee EH/1, Acoustics, to Subcommittee EH/1/4, Machinery noise, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

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This British Standard, having been prepared under the direction of the Health and Environment Sector Committee, was published under the authority of the Standards Committee and comes into effect on 15 July 2001

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Acoustics — Noise control design procedures for open plant

*Acoustique — Modes opératoires de contrôle du bruit dans les installations
ouvertes*



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 15664 was prepared by Technical Committee ISO/TC 43, *Acoustics*, Subcommittee SC 1, *Noise*.

Annexes A to I of this International Standard are for information only.

Introduction

This International Standard defines procedures for the noise control design of open plants, including oil refineries, chemical plants, gas plants, unenclosed powerplants, steelworks, gravel washing plants, cement plants, concrete batch plants and other continuous, batch or intermittent operation plants located in the open, in order to achieve optimal environmental, occupational, technical and economic benefits.

This International Standard is applicable to the design of new plants and to the modification/extension of existing plants. It is based on experience in the design, construction, operation and maintenance of such facilities and identifies the major technical and procedural issues that should be addressed in a good plant noise control design.

The users of this International Standard should be familiar with the type of plant involved and have sufficient technical expertise and experience in industrial plant noise control design. This International Standard is intended to be flexible to suit the nature and location of the plant being designed, and the technical abilities of the parties involved.

Where there is any conflict between this International Standard and any local regulations, the requirements of the local regulations should be complied with.

It is specifically intended that the end-user and the contractor agree on the nature and extent of the work to be done and the reporting on the work, and which party carries out what work.

This International Standard is not intended specifically to be a contract document, but it is recognized that annex B and any additional requirements specified separately may form part of a contract between the end-user and the contractor.

This International Standard is not considered suitable for reference in procurements specifications (requisitions) of individual equipment as it addresses issues that are often beyond the scope of an individual equipment item vendor.

A list of standards related to this International Standard is given in the Bibliography.

Acoustics — Noise control design procedures for open plant

1 Scope

This International Standard defines the procedures for noise control of mainly open plants.

It is applicable to the following:

- specification of procedures for noise control during engineering of a new plant and modification/extension of existing plants (construction noise procedures are outside the scope of this International Standard but should be considered);
- definition of responsibilities of parties involved, viz. “end-user”, “engineering contractor” and “equipment supplier”;
- description of general procedures to arrive at noise requirements for individual equipment, on the basis of overall noise requirements for the plant.

A schematic flowchart, reviewing the noise control process, is presented in annex A and a summary of action items is presented in annex B.

NOTE Concerning specific engineering methods for the acoustic design and analysis of plants, use should be made of other standards and textbooks.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 1996-1, *Acoustics — Description and measurement of environmental noise — Part 1: Basic quantities and procedures*

ISO 1996-2, *Acoustics — Description and measurement of environmental noise — Part 2: Acquisition of data pertinent to land use*

ISO 3864, *Safety colours and safety signs*

3 Terms and definitions

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

3.1 General terms

3.1.1

end-user

party which initiates the project and ultimately owns or operates the plant, or pays for its design and construction

NOTE The end-user will generally specify the technical objectives and/or requirements.

3.1.2

contractor

party which carries out all or part of the design, engineering, procurement, construction and commissioning for the project

3.1.3

manufacturer

supplier

party which manufactures or supplies equipment and services to perform the duties specified by the contractor

3.1.4

work area

any position not less than 1 m from equipment surfaces accessible to personnel, and any position where a worker's ear may be exposed to noise in the normal course of his duty

NOTE The work area includes any platform, walkway or ladder.

3.1.5

project specification

document defining the scope of a project

NOTE It can contain descriptions of the process, project management, responsibilities and engineering requirements. These include safety and environmental requirements.

3.1.6

governing authorities

local, regional, national or other authorities that specify and enforce criteria for environmental and occupational health noise

3.2 Terms specific to noise

3.2.1

noise limit

noise levels not to be exceeded and given as a sound power level, sound pressure level or noise exposure level

3.2.1.1

authority noise limits

noise limits set by governing authorities

3.2.1.3

contractual noise limits

noise limits set by the end-user as part of a legal contract between the end-user and the contractor, considering authority noise limits and company requirements

3.2.1.4

equipment noise limits

noise limits set by an end-user or contractor for a manufacturer/supplier for an individual equipment item

3.2.2**tonal noise**

noise which is dominated by one or several clearly distinguishable tone(s)

NOTE See ISO 1996-2.

3.2.3**impulsive noise**

noise consisting of one or more bursts of sound energy of duration less than about 1 s

NOTE See ISO 1996-2 (environmental noise), ISO 1999 (in-plant noise) and ISO 12001 (equipment emission).

3.2.4**fluctuating noise**

noise whose level varies continuously and to an appreciable extent during the period of observation

[ISO 12001:1996, definition 3.19.1]

3.2.5**intermittent noise**

noise whose level abruptly drops to the level of the background noise several times during the period of observation

[ISO 12001:1996; definition 3.19.2]

NOTE The time during which the level remains at a constant value different from that of the ambient is of the order of 1 s or more.

3.2.6**noise emission**

airborne sound radiated by well-defined noise source, such as a machine, equipment, part of a plant or an entire plant

NOTE See ISO 12001 and ISO 11690-1.

3.2.7**noise immission**

total amount of noise from all contributing sources at a given position

NOTE See ISO 11690-1.

3.2.8**noise exposure**

all noises that arrive, over a specific time period, T , at a person's ear in the actual situation

NOTE See ISO 11690-1; for the purposes of this International Standard, this term is also used for specific positions in the environment.

4 General requirements

The control of noise in a plant is necessary for the following reasons:

- to prevent noise-induced hearing loss;
- to reduce work, speech and concentration interference;
- to provide quiet living accommodation for personnel;