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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

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Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



DRAFT International Standard

ISO/DIS 15664

Acoustics — Noise control design procedures for open plant

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

ICS: 17.140.20

ISO/TC 43/SC 1

Secretariat: **DIN**

Voting begins on:
2024-12-16

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2025-03-10

This document is circulated as received from the committee secretariat.

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 43, *Acoustics*, Subcommittee SC 1, *Noise*.

This second edition cancels and replaces the first edition (ISO 15664:2001), which has been technically revised.

The main changes are as follows:

- The scope of this document has been updated to reflect that requirements to suppliers of noise emitting equipment have been defined.
- Supplementary specification to this document as defined in S-717 by the Joint Industry Programme 33 (JIP33) of the International Association of Oil and Gas Producers (IOGP) has been added in a new normative annex ([Annex A](#)).
- The equipment noise data sheet ([Annex E](#)) has been updated.
- A recommended area noise limit has been included to be used where area noise limits are not defined elsewhere.
- [Clause 6](#) has been updated to reflect changes in acoustic engineering work practises and the use of computational noise modelling tools.
- [Annex C](#) in revision 1 has been removed from revision 2.

[Annex A](#) of this document is normative.

[Annexes B](#) to [I](#) of this document are for information only.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

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

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

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

This document is not intended specifically to be a contract document, except for [Annex A](#) which is considered suitable for procurement specifications of individual equipment.

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

Acoustics — Noise control design procedures for open plant

1 Scope

This document defines the procedures for noise control of mainly open plants and the requirements on equipment suppliers for reporting and testing of noise.

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 and commissioning noise procedures are outside the scope of this document);
- 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, based on overall noise requirements for the plant.

Input to purchase specifications is presented in [Annex A](#).

A schematic flowchart, reviewing the noise control process, is presented in [Annex B](#) and a summary of action items is presented in [Annex C](#).

An example of an equipment noise data sheet is presented in [Annex E](#).

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.

ANSI S12.12, *Method for the determination of sound power levels of noise sources using sound intensity*

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

ISO 1996-2, *Acoustics — Description, measurement and assessment of environmental noise — Part 2: Determination of sound pressure levels*

ISO/PAS 1996-3, *Acoustics — Description, measurement and assessment of environmental noise — Part 3: Objective method for the measurement of prominence of impulsive sounds and for adjustment of L_{Aeq}*

ISO 3741, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Precision methods for reverberation test rooms*

ISO 3743 (all parts), *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for small, movable sources in reverberant fields*

ISO 3744, *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*

ISO 3745, *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 3746, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane*

ISO 3747, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering/survey methods for use in situ in a reverberant environment*

ISO 3864, *Safety colours and safety signs*

ISO 8297, *Acoustics — Determination of sound power levels of multisource industrial plants for evaluation of sound pressure levels in the environment — Engineering method*

ISO 14163, *Acoustics — Guidelines for noise control by silencers*

ISO/TS 20065, *Acoustics — Objective method for assessing the audibility of tones in noise — Engineering method*

3 Terms and definitions

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

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

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

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 1 to entry: 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 duty

Note 1 to entry: The work area also includes any platform, walkway or ladder.

3.1.5

project specification

document defining the scope of a project

Note 1 to entry: It can contain descriptions of the process, project management, responsibilities and engineering requirements. These include safety and environmental requirements.

3.1.6

regulatory 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

regulatory noise limits

noise limits set by regulatory 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

area noise limits

noise limits set by the end-user or contractor for a work area given as A-weighted equivalent continuous sound pressure level

3.2.1.5

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 1 to entry: See ISO 1996-2 and ISO/TS 20065.

3.2.3

impulsive noise

sound characterized by brief bursts of sound pressure

Note 1 to entry: The duration of a single impulsive sound is usually less than 1 s. See ISO 1996-1 and ISO/PAS 1996-3.

3.2.4

fluctuating noise

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

Note 1 to entry: See ISO 12001.

3.2.5

intermittent noise

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

Note 1 to entry: See ISO 12001.

Note 2 to entry: 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 a well-defined noise source, such as a machine, equipment, part of a plant, or an entire plant

Note 1 to entry: See ISO 12001 and ISO 11690-1.

3.2.7**noise immission**

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

Note 1 to entry: 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 1 to entry: See ISO 11690-1; for the purposes of this document, this term is also used for specific positions in the environment.

3.2.9

equivalent continuous sound pressure level $L_{p,eqT}$

ten times the logarithm to the base 10 of the ratio of the time-average of the square sound pressure, p , during a stated time interval of duration T (starting at t_1 and ending at t_2), to the square of a reference value, p_0 ,¹ expressed in decibels

$$L_{p,T} = L_{p,eqT} = 10 \lg \left[\frac{\frac{1}{T} \int_{t_1}^{t_2} p^2(t) dt}{p_0^2} \right] dB$$

where the reference value, p_0 , is 20 µPa

[SOURCE: ISO/TR 25417:2007]

3.2.10**sound pressure level**

L_p

quantity given by:

$$L_p = 10 \lg \frac{p_{RMS}^2}{p_0^2} dB$$

where p_{RMS} is the root-mean-square sound pressure in the time domain and p_0 is the reference value of sound pressure

[SOURCE: ISO 80000-8:2020]

3.2.11

sound power level L_w

quantity given by:

$$L_w = 10 \lg \frac{P_m}{P_0} dB$$

where P_m is the magnitude of the time-averaged sound power and P_0 is the reference value of sound power 1 pW

[SOURCE: ISO 80000-8:2020]