PUBLICLY **AVAILABLE SPECIFICATION**

ISO/PAS 17208-1

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Acoustics — Quantities and procedures for description and measurement of underwater sound from ships -

Part 1:

General requirements for measurements in deep water

Acoustique — Grandeurs et modes de description et de mesurage de jr narin. es génér. l'acoustique sous-marine des navires —

Partie 1: Exigences générales pour les mesurages en eau profonde

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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 2.

The main task of technical committees is to prepare International Standards. 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.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of document:

- an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;
- an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

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.

ISO/PAS 17208-1 was prepared by Technical Committee ISO/TC 43, *Acoustics*, Subcommittee SC 1, *Noise*. However, by the time of its publication, responsibility for this document, as well as for future underwater acoustics work, had been transferred to Subcommittee SC 3, *Underwater acoustics*.

ISO/PAS 17208 consists of the following parts, under the general title Acoustics — Quantities and procedures for description and measurement of underwater sound from ships:

— Part 1: General requirements for measurements in deep water [Publicly Available Specification]

Measurements in shallow water is to form the subject of a future part of ISO 17208.

Introduction

This part of ISO 17208 was developed to provide a standardized measurement method for the quantification and qualification of a ship's underwater (radiated) noise, and is aimed at promoting consistency of reported sound measurements from shipping sources. Reduction of all types of vessel emissions — most notably, ballast water and engine emissions — became an issue in the decade prior to its publication. More recently, those concerns came to include underwater noise and its the impact on marine animals.

Excessive underwater noise has the potential to interfere with a marine animal's ability to perform a variety of critical life functions, including navigation, communication and finding food. Because of this, the environmental roj swate. impact statements of underwater projects such as pile-driving, pipe-laying and oil exploration now include assessments of the impact of underwater noise.

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Acoustics — Quantities and procedures for description and measurement of underwater sound from ships —

Part 1: **General requirements for measurements in deep water**

1 Scope

This part of ISO 17208 describes the general measurement systems, procedures and methodologies to be used to measure underwater sound pressure levels from ships at a prescribed operating condition. It presents a methodology for the reporting of one-third-octave band sound pressure levels. The resulting quantities are the sound pressure levels normalized to a distance of 1 m. Since the underwater sound pressure levels are affected by the presence of the free surface (and sometimes the bottom), such quantities are sometimes called "affected source levels" (see ANSI/ASA S12.64-2009). This part of ISO 17208 refers to the result of these measurements as "radiated noise levels".

The underwater sound pressure level measurements are performed in the geometric far field and then adjusted to the 1 m normalized distance for use in comparison with appropriate underwater noise criteria. However, this part of ISO 17208 does not specify or provide guidance on underwater noise criteria or address the potential effects of noise on marine organisms.

This part of ISO 17208 is applicable to any and all underway surface vessels, either manned or unmanned. Its methods have no inherent limitation on minimum or maximum vessel size. It is not applicable to submerged vessels or to aircraft, and is limited to vessels transiting at speeds no greater than 50 knots (25,70 m/s). The measurement methods mitigate the variability caused by Lloyd's mirror surface image coherence effects, but do not exclude a possible influence of propagation effects such as bottom reflections, refraction and absorption. No specific computational adjustments for these effects are given. A specific ocean location is not required for the application of this part of ISO 17208, but requirements for an ocean test site are provided.

Among the applications of this part of ISO 17208 are the showing of compliance with contract requirements, the enabling of periodic signature assessments and in research and development. Intended users include government agencies, research vessel operators and commercial vessel owners operating in acoustically sensitive waters.

This part of ISO 17208 offers three grades of measurement — A, B and C — each with a stated applicability, test methodology, uncertainty, system repeatability and complexity. A summary of the attributes of each grade is given in Table 1. Application of the three grades of measurement to the same ship under the same conditions does not necessarily result in the same radiated noise level.

2 Normative references

The following referenced documents are indispensable for the application 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.

IEC 60565, Underwater acoustics — Hydrophones — Calibration in the frequency range 0,01 Hz to 1 MHz

IEC 61260, Electroacoustics — Octave-band and fractional-octave-band filters

ANSI S1.1, American National Standard Acoustical Terminology