FINAL DRAFT
International Standard

ISO/FDIS 17208-3

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

Part 3: Requirements for measurements in shallow water

Grandeurs et modes de description et de mesurage de l'acoustique sous-marine des navires —
Partie 3: Exigences pour les mesurages en eau peu profonde

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Foreword

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This document was prepared by Technical Committee ISO/TC 43, *Acoustics*, Subcommittee SC 3, *Underwater acoustics*.

A list of all parts in the ISO 17208 series can be found on the ISO website.

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

ISO 17208 series describe procedures for the measurement and analysis of underwater sound from ships. The methodology and measurement configuration are sufficient to provide reliable acoustic data, but also suitable for end-users to conduct the measurements without access to large, fixed sound measurement facilities. ISO17208-1 covers measurements of radiated noise level in deep water, and ISO 17208-2 the calculation of source level from the deep-water data. This document has been developed to address the need to cover source level measurements in shallow water, one reason being that deep water maritime areas are sometimes far away from the zone of operation of the ships considered.

The development of this document was supported by the EU-funded Horizon 2020 research programme SATURN (Developing solutions to underwater radiated noise)[1)] and by the MMP2 project[2)], sponsored by Transport Canada's Innovation Centre.

1) https://doi.org/10.3030/101006443

2) https://doi.org/10.1121/10.0017433

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

Part 3: Requirements for measurements in shallow water

1 Scope

ISO 17208 series describe procedures for the measurement of underwater sound radiated by the ship under test, and for calculating sound source quantities such as source level and radiated noise level from the measurement results.

In ISO 17208-1 to ISO 17208-3 it is presumed that the ship under test cooperates in the measurements, sailing multiple runs over a specified track past the measurement system at a specified speed with pre-determined machinery configurations. Opportunistic measurements of the radiated sound of passing ships are outside the scope of these three standards.

Part 1 of the ISO 17208 standards[1] provides the procedure to quantify the underwater sound from the ship in terms of its radiated noise level, which is calculated from the sound pressure level (SPL) measured in the far field of the ship, in beam aspect, scaled by the distance to CPA and reported in decidecade bands. The intended use of radiated noise level is to show compliance with contract requirements or criteria, for comparison of one ship to another ship, to enable periodic signature assessments, and for research and development.

ISO 17208-2[1] specifies methods for calculating the source level of an equivalent monopole source at a specified nominal source depth from the radiated noise level values obtained according to ISO 17208-1. The intended use of source level, with associated nominal source depth, is to perform far field sound predictions such as needed for environmental impact studies or for creating underwater sound contour maps.

ISO 17208-1 and ISO 17208-2[1] are applicable for measurements in deep water, defined as water depth greater than the larger of 150 m and 1,5 times overall ship length. The allowable water depths and environmental conditions for part 3 measurements are described in 4.5.

This document specifies procedures for the measurement of underwater sound radiated by the ship under test in shallow water. It also specifies procedures for the calculation of source level, with associated nominal source depth, from the sound pressure measurements, accounting for the relevant phenomena that govern the propagation of sound in shallow water. These calculations are described in Clause 7. once the source level has been calculated, other metrics may be calculated from the source level and the source depth. 7.3 provides a procedure for calculating the radiated noise level that would have been measured in deep water according to ISO 17208-1 for the same ship with the same operating condition.

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.

ISO 18405, *Underwater acoustics — Terminology*