
**Ships and marine technology —
Guidelines on vibration isolation
design methods for shipboard
auxiliary machinery**

*Navires et technologie maritime — Lignes directrices pour la
conception de l'isolation antivibratoire des machines auxiliaires de bord*

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Foreword

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This document was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 8, *Ship design*.

Introduction

This document has been developed in response to the demand, noted by the International Maritime Organization (IMO) and its Marine Environment Protection Committee (MEPC), for an International Standard on reduction of vibration and noise from machinery onboard ships, considering the negative effects of ship vibration and noise on the health of seafarers and the negative effects of underwater noise radiated from ships on marine life.

The reduction of ship vibration and noise may necessitate machinery vibration isolation measures. Although marine machinery vibration isolation design can be done by professional groups, such as consultant companies, with the development of modern shipbuilding technology, the integration of various technical fields for ship design is becoming a necessity.

The ship designers themselves should also understand the procedures, requirements and basic methodology of vibration isolation for shipboard machinery. The purpose of developing a basic methodology in this document is not limited to better vibration isolation measures, but to help ship designers take into account the need of machinery vibration isolation, planning for the space and weight for machinery vibration isolation in advance at the design stage and to consequently promote the application of vibration isolation design technology onboard.

Vibration isolation concerns the use of comparatively resilient elements called vibration isolators. Practical vibration isolators usually consist of springs, of elastomeric elements with damping or of a combination of these. The primary purpose of isolators is to attenuate the transmission of vibrations, whereas the main purpose of dampers is the dissipation of mechanical energy. Simple models based on systems with a single degree of freedom are useful for establishing some fundamental relations, such as single-stage isolation. Extensions of these models can account for the non-rigidity of supports and isolated items, as well as for reaction effects on vibration sources. More complex models apply to two-stage isolation that can provide greater attenuation than single-stage isolation systems. As common measures onboard a ship, single-stage and double-stage vibration isolation design methods are suggested in this document.