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Mechanical vibration — Measurement of vibration on ships —

Part 4:

Measurement and evaluation of vibration of the ship propulsion machinery

Vibrations mécaniques — Mesurage des vibrations à bord des navires —

*Partie 4: Mesurage et évaluation des vibrations des machines de
propulsion des navires*



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Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Vibration tests	3
4.1 Instrumentation	3
4.2 Test conditions	3
4.3 Test procedure	4
4.4 Data processing	5
4.5 Measurements	5
5 Evaluation criteria	14
6 Test report	15
Annex A (informative) Manoeuvring, transient measurements	16
Annex B (informative) Evaluation of vibration at mechanical azimuth drives (e.g. Schottel rudder propellers) and shaft lines by measurements on non-rotating parts	17
Annex C (informative) Evaluation of the vibration of a Voith–Schneider propeller by measurements on non-rotating parts	18
Bibliography	20

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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.

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 20283-4 was prepared by Technical Committee ISO/TC 108, *Mechanical vibration, shock and condition monitoring*, Subcommittee SC 2, *Measurement and evaluation of mechanical vibration and shock as applied to machines, vehicles and structures*.

ISO 20283 consists of the following parts, under the general title *Mechanical vibration — Measurement of vibration on ships*:

- *Part 2: Measurement of structural vibration*
- *Part 3: Pre-installation vibration measurement of shipboard equipment*
- *Part 4: Measurement and evaluation of vibration of the ship propulsion machinery*

The following part is planned:

- Part 1: General guidelines

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Introduction

In general, classification societies ask for a numerical study on the torsional vibration behaviour of the propulsion system for seagoing vessels at the design stage as a base for the design approval. Depending on the results of this study and the kind of plant to be considered, further torsional vibration investigations for verification on a case-by-case study may be required. Explicit criteria for the evaluation of the torsional loadings are given within the rules of the international classification societies as well as in the form of unified requirements (UR) of the International Association of Classification Societies, specifically IACS UR M68,^[10] with focus on the torque transmitting parts, such as shafts, gears, couplings, and connections. Studies of the bending vibration behaviour of the shaft as well as axial vibration of the propulsion system or crankshaft may be required by the classification societies in the exceptional case that the special design of the system makes such additional investigations necessary.

Propulsion systems may be exposed to vibration of high magnitude in general excited by the engine and/or propeller. In addition to the numerical criteria for evaluation of torsional vibration, some further special requirements may be raised, such as avoiding load reversal in the transmission train. In general, mechanical components may be perfectly designed for load reversal operation; however, some specific requirements in this direction are also based on smooth operation of the plant, and the owners or managers of special vessels such as navy ships or yachts consequently raise them.

The user of this part of ISO 20283 should bear in mind that for the evaluation of measured data on propulsion plants of ships the rules of the responsible classification society for the vessel in their latest edition or the valid IACS UR should be considered.

Should any issues regarding this part of ISO 20283 be directly or indirectly addressed by the contracted classification society's rules or other international binding regulations, such as those of the International Maritime Organization (IMO), the International Convention for the Safety of Life at Sea, and UK Maritime and Coastguard Agency, the choice of the measuring method applied should fulfil the sense of these rules or regulations, independently of whether the special measuring method is specified within this part of ISO 20283.