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Ships and marine technology — Manoeuvring of ships —

Part 1: General concepts, quantities and test conditions

Navires et technologie maritime — Manoeuvres des navires —

Partie 1: Notions générales, grandeurs et conditions d'essais

Reference number
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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).

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For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 8, *Ships and marine technology*, Subcommittee SC 6, *Navigation and ship operations*.

This second edition cancels and replaces the first edition (ISO 13643-1:2013), of which it constitutes a minor revision with the following changes:

— Table 8, CC-Code VK symbol "*N*" to "ν";

— Table 8, CC-Code RHOWA symbol "*P*" to "ρ";

— Table 8, CC-Code OMN symbol "Ω" was changed to "ω";

— 7.9.2, Equations (1) and (2) in the last term Symbol "φ" was changed to "ϕ";

— 7.9.3, third sentence of the subclause "where as $q = \dot{\theta}$ and $\dot{q} = \ddot{\theta}$ well as $w = \dot{z}$ and $\dot{w} = \ddot{z}$ " was changed to "where $q = \dot{\theta}$ and $\dot{q} = \ddot{\theta}$ as well as $w = \dot{z}$ and $\dot{w} = \ddot{z}$";

— 8.2 "a) stopping test" has been inserted.

A list of all parts in the ISO 13643 series can be found on the ISO website.

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Ships and marine technology — Manoeuvring of ships —

Part 1:
General concepts, quantities and test conditions

1 Scope

This document applies to manoeuvring tests with surface ships, submarines and models.

This document defines concepts, symbols and test conditions constituting general fundamentals which are to be applied for the description and determination of certain ship manoeuvring characteristics together with the respective test-specific physical quantities contained in ISO 13643-2 to ISO 13643-6.

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 19019, *Sea-going vessels and marine technology — Instructions for planning, carrying out and reporting sea trials*

3 Terms and definitions

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

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

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp/

3.1
manoeuvring
all *manoeuvres* (3.2), *manoeuvring tests* (3.3) and tests or other methods, such as computations, simulations, etc. to establish manoeuvring characteristics

Note 1 to entry: Manoeuvring includes measures to maintain cruising conditions under external disturbances.

3.2
manoeuvre
ship operation measures to change course and/or speed, and in case of submarines, depth

Note 1 to entry: Special actions taken, e.g. for casting-off, turning aside or rescuing (person over board), are included.

3.3
manoeuvring test
test conducted with a full-scale ship, submarine or a model to determine and evaluate the manoeuvring characteristics under standardized conditions

Note 1 to entry: Manoeuvring tests are often similar to manoeuvres, but organized in such a manner that, as far as possible, specific manoeuvring characteristics can be measured individually.

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3.4
CC-Code
computer compatible symbols introduced by the 14th International Towing Tank Conference

3.5
manoeuvring device
rudder, azimuthing thruster, hydroplane, cycloidal propeller or equivalent system used to *manoeuvre* (3.2) a vessel

4 Axis systems

4.1 General

Axis systems are three-dimensional, orthogonal, right-handed systems. Earth-fixed and ship-fixed axis systems are defined in Tables 1 and 2.

4.2 Earth-fixed axis system

Table 1 — Symbols and their definitions for the earth-fixed axis system

Symbol	CC-Code	SI-Unit	Term	Position	Positive sense
O_0	ORIG0	—	Origin, earth-fixed	Arbitrary, but preferably in the water surface	—
O	ORIG	—	Origin, ship-fixed (moving with the ship)	Preferably according to Table 2	—
x_0	X0	m	—	In the horizontal plane[a]	Arbitrary
y_0	Y0	m	Transverse axis	In the horizontal plane[a]	Right-handed system with x_0, z_0
z_0	Z0	m	Vertical axis	In the direction of gravity	Down
[a] Assuming earth or water surfaces to be plane.					

4.3 Ship-fixed axis system

Table 2 — Symbols and their definitions for the ship-fixed axis system

Symbol	CC-Code	SI-Unit	Term	Position	Positive sense
O	ORIG	—	Origin, ship fixed	For surface ships in CL at the height of DWL at MP For submarines on MA in the lateral plane of B_∇	—
x	X	m	Longitudinal axis	In CL or MA	Forward
y	Y	m	Lateral axis	Perpendicular to CL	Starboard
z	Z	m	Normal axis	In CL	Right-handed system with x and y (under normal cruising conditions down)

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