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Ships and marine technology — Manoeuvring of ships —

Part 4: Stopping, acceleration, traversing

Navires et technologie maritime — Manoeuvres des navires —

Partie 4: Arrêt, accélération, déplacement

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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 13643-4:2013), of which it constitutes a minor revision with the following changes:

— the numbering has changed;

— in Clause 4, Table 1, in the second line of the table (CC-Code DECFAC), the Definition was changed;

— in Clause 4, Table 1, in line 9 of the table (CC-Code TIACC), the SI-Unit was changed from "m" to "s".

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 4: Stopping, acceleration, traversing

1 Scope

This document defines symbols and terms and provides guidelines for the conduct of tests to give evidence about the stopping, acceleration, and traversing of surface ships, submarines, and models. It is intended to be read in conjunction with ISO 13643-1.

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 13643-1, *Ships and marine technology — Manoeuvring of ships — Part 1: General concepts, quantities and test conditions*

ISO 13643-5:2017, *Ships and marine technology — Manoeuvring of ships — Part 5: Submarine specials*

ISO 80000-1, *Quantities and units — Part 1: General*

ISO 80000-3, *Quantities and units — Part 3: Space and time*

IMO MSC Circular 1053, *Explanatory Notes to the Standard for Ship Manoeuvrability*

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
acceleration test
manoeuvring test to determine the ship's performance under positive acceleration or negative acceleration (deceleration)

3.2
coasting stop test
manoeuvring test to determine the ship's behaviour after the propulsion plant has been disengaged and/or shut down

3.3
manoeuvring device
rudder, azimuthing thruster, hydroplane, cycloidal propeller, or equivalent system used to manoeuvre a vessel

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3.4
stopping test
manoeuvring test to determine the ship's behaviour after active reversal of the thrust direction of the propulsion plant

3.5
traversing test
manoeuvring test to determine the ship's capability to execute a lateral movement, if possible without turning and moving in the longitudinal direction

4 Test-related physical quantities

Test-related physical quantities are listed in Table 1. The more general quantities and concepts concerning the manoeuvring of ships are set out in ISO 13643-1.

For quantities and their units, ISO 80000-1 and ISO 80000-3 shall be used.

Table 1 — Test-related physical quantities

Symbol	CC-Code	SI-Unit	Concept	
			Term	Definition or explanation
s_F	SPF	m	Track reach	Distance travelled from $t = 0$ up to the time the ship is "practically dead in the water" measured along the ship's track
$\frac{s_F}{V_0}$	DECFAC	s[a]	Track reach deceleration factor	Average time to decelerate by one knot
s_S	SPS	m	Track reach to propulsor stop	If the propulsion is shut down, distance travelled along the ship's track before the propulsion has come to a complete stop
s_a	SPACC	m	Acceleration distance	Distance travelled along the ship's track before the target speed is achieved
$s_{(t)\min}$	SP(t)	m	Track reach after (t) minutes	(t) stands for elapsed time after $t = 0$, example: track reach after 3 minutes: $s_{3\min}$ or SP3
t_F	TIF	s	Stopping time	For stopping test: From $t = 0$ to the time when the ship is "dead in the water"
			Coasting time	For coasting stop test: From $t = 0$ to the time when the ship is "practically dead in the water" ($V \leq 2$ kn)
t_S	TIS	s	Time to propulsor stop	If the propulsion is shut down, the time until the propulsion has come to a complete stop
t_U	TIU	s	Reversal time	Until full astern power is achieved
t_a	TIACC	s	Acceleration time	Time elapsed to achieve the target speed (within a margin of 1 kn)
V_L	VL	m s $^{-1}$ [b]	Steerage way	Speed down to which the ship still follows the manoeuvring devices
V_i	VI	m s $^{-1}$ [b]	Target speed	Speed to which the ship is accelerated or decelerated
V_{x0}	VX0	m s $^{-1}$ [b]	Advance speed	Component in x_0-direction, relative to the initial heading of the ship

[a] The unit m/kn may be used.

[b] The unit kn, common in navigation, may be used.

[c] For angles, the unit ° (degree), may be used.

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