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**Ships and marine technology — Heading  
control systems for high-speed craft**

*Navires et technologie maritime — Systèmes de pilotage automatique  
pour les navires à grande vitesse*

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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 16329 was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 6, *Navigation*.

# Ships and marine technology — Heading control systems for high-speed craft

## 1 Scope

This International Standard specifies the structure, performance, inspection and testing of heading control systems to be installed on board craft operating under the following conditions:

- a) *speed exceeding 30 kn and up to 70 kn;*
- b) *maximum rate of turn 20°/s;*
- c) *normal range of operation between 70°N and 70°S should, as required by chapter 13 of the HSC Code, comply with the minimum performance requirements specified in these standards.*

This International Standard applies to the heading control systems which enable a craft to *keep a preset heading with minimum operation of the craft's steering gear, within limits related to the craft's manoeuvrability in conjunction with their sources of heading information.*

This International Standard assumes the use of a conventional arrangement. Where other arrangements are provided, the requirements of this standard should apply insofar as they are applicable, and appropriate justification provided where deviation from the requirements is necessary.

The heading control systems *should, within a speed range of up to 30 knots, comply with resolution A.342(IX), and within a speed range of 30 knots to 70 knots should comply with the requirements of this resolution.*

NOTE 1 All requirements that are extracted from the recommendations of IMO Resolutions [Resolution A.822(19) on performance standards for automatic steering aids for high-speed craft, A.694(17) and A.342(IX)] are printed in italics.

NOTE 2 The heading control system was previously called "automatic steering aids (automatic pilot)".

NOTE 3 Resolution A.342(IX) represents Resolution A.342(IX) as amended by MSC.64(67), Annex 3.

## 2 Normative references

The following referenced documents are indispensable for the application 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 694, *Ships and marine technology — Positioning of magnetic compasses in ships*

ISO 16328, *Ships and marine technology — Gyro-compasses for high-speed craft*

IEC 60945, *Maritime navigation and radiocommunication equipment and systems — General requirements — Methods of testing and required test results*

IEC 61162 (all parts), *Maritime navigation and radiocommunication equipment and systems — Digital interfaces*

IMO Resolution A.694(17), *General requirements for shipborne radio equipment forming part of the global maritime distress and safety system (GMDSS) and for electronic navigational aids*

IMO Resolution A.822(19), *Performance standards for automatic steering aids (automatic pilots) for high-speed craft*

IMO Resolution MSC.64(67), Annex 3:1997, Amendment to resolution A.342(IX), *Performance standards for heading control systems*

### 3 Terms and definitions

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

**3.1 heading**  
horizontal direction in which a craft actually points or heads at any instant, expressed in degrees from a reference direction, usually from 000° at the reference direction clockwise through 360°, where 360° becomes identical with 000°

**3.2 preset heading**  
horizontal direction in which a craft is steered or intended to be steered, expressed as the angular direction with respect to north (true/magnetic), from 000° clockwise through 360°, where 360° becomes identical with 000°

**3.3 manual steering**  
method of controlling the steering gear manually

EXAMPLE Using a steering wheel.

**3.4 automatic steering**  
method of controlling the steering gear automatically to enable a craft to keep, or change to, a preset heading by processing the heading information obtained from a heading source, such as a gyro-compass or transmitting magnetic compass, etc.

**3.5 change-over device**  
device for changing-over from automatic to manual steering and vice versa

**3.6 automatic-steering device**  
device which controls automatic steering

**3.7 proportional rudder adjustment**  
adjustment of a component of the total rudder command in proportion to an instantaneous value of the difference between the preset heading and actual heading

**3.8 derivative rudder adjustment**  
counter rudder adjustment  
adjustment of a component of the total rudder command which acts to control the rate of turn of the craft