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

*Navires et technologie maritime — Compas gyroscopiques pour
navires à grande vitesse*

Sample Document

get full document from standards.iteh.ai



Reference number
ISO 16328:2014(E)

© ISO 2014

Sample Document

get full document from standards.iteh.ai



COPYRIGHT PROTECTED DOCUMENT

© ISO 2014

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Construction	3
4.1 Gyro-compass equipment	3
4.2 Continuous operation	3
4.3 Bearing repeater compass ¹⁾	3
4.4 Graduation and digital display	3
4.5 Illumination	3
4.6 Lubber line	3
4.7 Fore and aft mark	3
4.8 Installation	4
4.9 Speed error correction	4
4.10 Heading information	4
4.11 Status signal	4
4.12 Alert signal	4
4.13 Power supply	4
4.14 Interface	5
5 Performance requirements	5
5.1 Accuracy in latitudes up to 70°	5
5.2 Other requirements	6
6 Type tests	6
6.1 General	6
6.2 Settling time test	6
6.3 Settle-point-error test	6
6.4 Settle-point-heading repeatability test	7
6.5 Settling time on a Scorsby table	7
6.6 Scorsby test	7
6.7 Intercardinal motion test	8
6.8 Repeater accuracy test	8
6.9 Speed error correction test	8
6.10 General requirement test	8
6.11 Interface test	11
7 Marking and identification	11
8 Information	11
Annex A (normative) Advice to ship surveyors for installation of gyro-compasses and repeater compasses on board crafts	12
Annex B (informative) Vehicle test	13
Annex C (informative) Equivalent requirements in this International Standard and IMO Resolutions	14
Bibliography	16

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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

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 16328:2001), of which has been technically revised.

[Annex A](#) forms a normative part of this International Standard. [Annexes B](#) and [C](#) are for information only.

Ships and marine technology — Gyro-compasses for high-speed craft

1 Scope

This International Standard specifies the construction, performance, and type testing for gyro-compass for high-speed craft required by chapter X, SOLAS 1974 (as amended).

NOTE All requirements that are extracted from the recommendations of IMO Resolutions [Resolution A.821(19) on performance standards for gyro-compasses for high-speed craft and A.694(17)] are printed in italics.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 25862, *Ships and marine technology — Marine magnetic compasses, binnacles and azimuth reading devices*

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

IEC 61162-1, *Marine navigation and radiocommunication equipment and systems — Digital interfaces — Part 1: Single talker and multiple listeners*

IEC 61162-2, *Maritime navigation and radiocommunication equipment and systems — Digital interfaces — Part 2: Single talker and multiple listeners, high-speed transmission*

IEC 61924-2, *Maritime navigation and radiocommunication equipment and systems — Integrated Navigation Systems (INS) — Part 2: Modular structure for INS-Operational and performance requirements, methods of testing and required test results*

IMO Resolution A.424 (XI), *Performance standards for gyro-compasses*

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 MSC.252(83), *Adoption of the revised performance standards for alert communications with an Integrated Navigation System*

IMO Resolution MSC.302(87), *Adoption of performance standards for bridge alert management*

IMO Resolution A.821(19), *Performance standards for gyro-compasses for high-speed craft*

3 Terms and definitions

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

3.1

gyro-compass

complete equipment including all essential elements of the complete design, including *both the gyro-compass as heading sensor and the associated heading transmission system*

3.2

true heading

horizontal angle between the vertical plane passing through the true meridian and the vertical plane passing through the craft's fore and aft datum line

Note 1 to entry: *It is measured from true north (000°) clockwise through 360°.*

Note 2 to entry: When the gyro-compass equipment is tested on the test stand, this "true heading" is regarded as the true heading of the lubber line. Where a gyro-compass has the facility of introducing a correction by moving the lubber line, the correction is set for the local latitude.

3.3

settled

stable situation when any three readings taken at intervals of 30 min are within a band of 0,7°, with the compass level and stationary

Note 1 to entry: The settling time is the elapsed time between the time of switch-on at the initial heading error and the third recording of the settle.

3.4

settle point heading

mean value of ten readings taken at 20 min intervals after the compass has settled ([3.3](#))

3.5

settle point error

difference between the settle point heading ([3.4](#)) and the true heading

3.6

error

difference between the observed value and the settle point heading ([3.4](#))

3.7

repeater compass

device that reproduces the master compass card at a remote location

3.8

bearing repeater compass

device that reproduces the master compass card for the purpose of taking bearings

3.9

compass card

graduated dial of the compass which indicates the measured direction of the meridian

3.10

latitude error

error to which some gyro-compasses are subject, the magnitude and sign of which depend upon the local latitude

3.11

speed error

error to which gyro-compasses are subject, the magnitude and sign of which depend upon the speed, course, and latitude of the craft

3.12

lubber line

index line situated on the body of gyro-compass or repeater compass against which the compass card is read

3.13

master compass

main compass unit which supplies the heading information to the repeaters and other navigational aids

3.14**scorsby table**

test machine which independently oscillates a platform about three axes, and is used to simulate the motion of a craft

4 Construction

Requirements for gyro-compass units.

4.1 Gyro-compass equipment¹⁾

Gyro-compass equipment shall include the provision of a compass card or analogue repeater for steering purposes and equipment for the purpose of taking a bearing.

4.2 Continuous operation

The equipment shall be capable of continuous operation under conditions of vibration, humidity, change of temperature, and variations of the power supply, as specified in [6.10](#).

4.3 Bearing repeater compass¹⁾

For those crafts which are required to carry a bearing repeater compass, the construction of these shall be as follows.

- a) The bearing repeater compass shall be designed to be fitted with an azimuth-reading device.
- b) A gimbal mechanism shall be provided to enable the bearing repeater compass card to be held horizontally against the craft's motion.

4.4 Graduation and digital display

The compass card shall *be graduated at equal intervals of 1° or a fraction thereof*. The graduation error shall be less than $\pm 0,2^\circ$. *A numerical indication shall be provided at least at every 10°, starting from 000° clockwise through 360°.*

A digital display may be provided. When a digital display is provided, the course shall be displayed as three digits plus, optionally, a fourth digit indicating tenths of a degree. When a gyro-compass with digital display is used, it shall incorporate a turning direction indicator.

4.5 Illumination

Adequate illumination shall be provided to enable the reading of all compass cards at all times. Facilities for dimming shall be provided.

4.6 Lubber line

Devices using a compass card shall be provided with a lubber line to indicate the craft's heading.

4.7 Fore and aft mark

If technically necessary, the compass shall be marked in a way to facilitate installation so that the lubber line lies in a vertical fore and aft plane of the craft or parallel. Where a gyro-compass has the facility of introducing a correction by moving the lubber line, the correction during installation shall be set to zero.

1) Advice to ship surveyors for installation on board craft is given in normative annex A.