

INTERNATIONAL STANDARD

**Maritime navigation and radiocommunication equipment and systems –
Electronic chart display and information system (ECDIS) – Operational and
performance requirements, methods of testing and required test results**

IEC 61174:2008

<https://standards.iteh.ai/en/standards/iec/61174/1b-d6ec-44c1-81b2-af2714f66cf0/iec-61174-2008>



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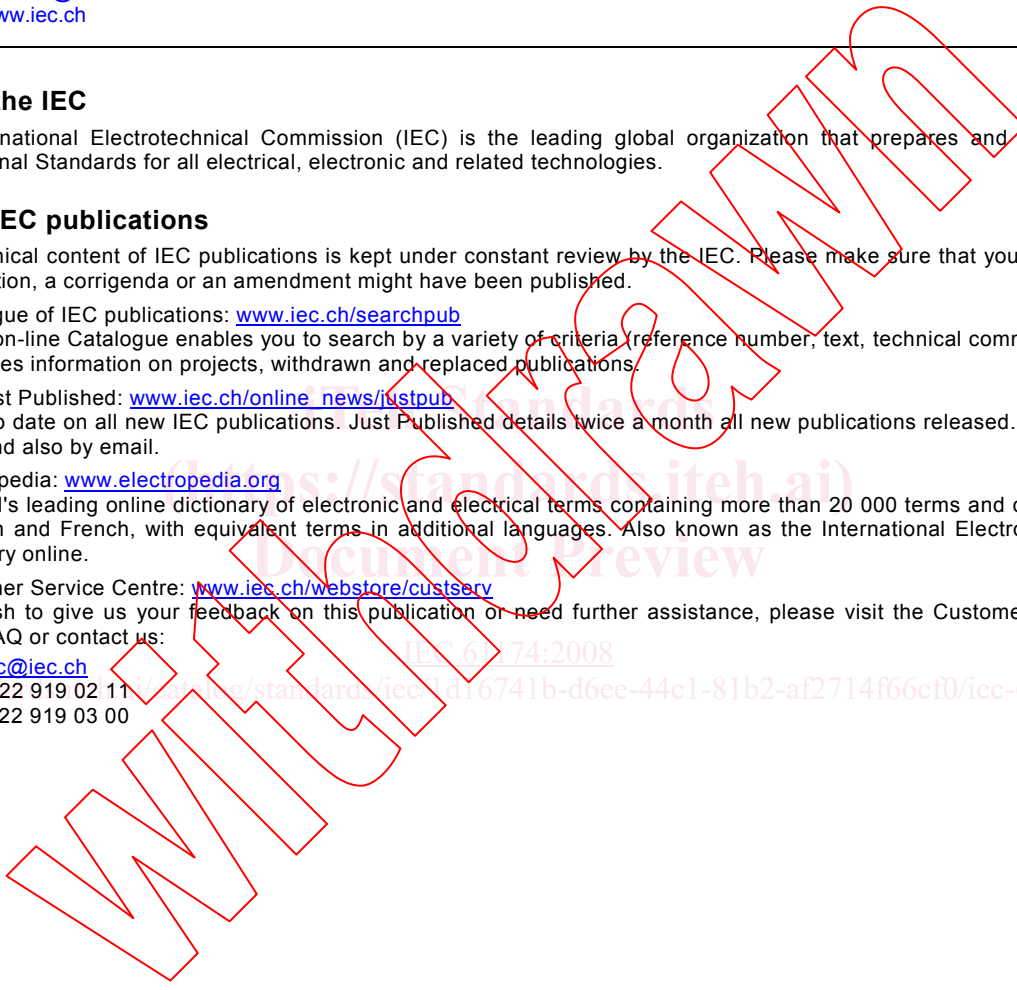
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS –

Electronic chart display and information system (ECDIS) – Operational and performance requirements, methods of testing and required test results

FOREWORD

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International Standard IEC 61174 has been prepared by IEC technical committee 80: Maritime navigation and radiocommunication equipment and systems.

This third edition of IEC 61174 cancels and replaces the second edition published in 2001, of which it constitutes a technical revision.

The main changes with respect to the previous edition are listed below:

- this edition incorporates revised performance standards for ECDIS adopted by the IMO as resolution MSC.232(82) in December 2006;
- the test methods have been updated accordingly and new tests added for encrypted ENC data;

- the revised IMO performance standards refer to performance standards for displays adopted by the IMO as resolution MSC.191(79) and these have been incorporated by reference to IEC 62288;
- Annex E of the previous edition which defined navigation symbols has been deleted as this information is now in IEC 62288.
- five new annexes have been added.

IMO changed the order of the performance standards in MSC.232(82) compared with the previous standards in resolution A.817(19). Annex N gives a cross-referencing of clause numbering.

The text of this standard is based on the following documents:

FDIS	Report on voting
80/535/FDIS	80/542/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS –

Electronic chart display and information system (ECDIS) – Operational and performance requirements, methods of testing and required test results

1 Scope

This International Standard specifies the performance requirements, methods of testing and required test results of equipment conforming to performance standards not inferior to those adopted by the IMO in resolution MSC.232(82).

This standard is based upon the performance standards of IMO resolution MSC.232(82), and is also associated with IMO resolution A.694(17) and IEC 60945. Reference is made, where appropriate, to IMO resolution MSC.232(82), and all subclauses whose wording is identical to that in the resolution are printed in italics.

In association with the above IMO resolution MSC.232(82), are the International Hydrographic Organization (IHO) special publications S-32, S-52, S-57, S-61, S-63 and S-64. This standard has included extracts from the above publications where they are applicable to this equipment. Where reference is made, all subclauses whose wording is identical to that in the publications, are printed in italics.

(232/A2.1) These performance standards should apply to all ECDIS equipment carried on all ships as follows:

– *dedicated standalone workstation.*

– *a multifunction workstation as part of an INS.*

(232/A2.2) These performance standards apply to ECDIS mode of operation, ECDIS in RCDS mode of operation as specified in Annex G and ECDIS backup arrangements as specified in Annex F.

(232/A2.3) Requirements for structure and format of the chart data, encryption of chart data as well as the presentation of chart data are within the scope of relevant IHO standards, including those listed in the normative references.

The requirements of this standard are not intended to prevent the use of new techniques in equipment and systems, provided the facilities offered are not inferior to those stated.

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.

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*

IEC 62288, *Maritime navigation and radiocommunication equipment and systems – Presentation of navigation-related information on shipborne navigational displays – General requirements – Methods of testing and required test results*

IEC 62388, *Maritime navigation and radiocommunication equipment and systems – Shipborne Radar – Performance requirements – Methods of testing and required test results*

IMO *International Convention for the safety of life at sea (SOLAS) 1974 (as amended)*

IMO A.424(XI):1979, *Performance standards for gyro-compasses*

IMO A.694(17):1991, *General requirements for shipborne radio equipment forming part of the global maritime distress and safety system (GMDSS) and for electronic navigational aids*

IMO A.821(19):1995, *Performance standards for gyro-compasses for high-speed craft*

IMO A.823(19):1995, *Performance standards for automatic radar plotting aids*

IMO A.824(19):1995, *Performance standards for devices to indicate speed and distance*

IMO A.830(19):1995, *Code on Alarms and Indicators*

IMO MSC.191(79), *Performance standards for the presentation of navigation-related information on shipborne navigational displays*

IMO MSC.192(79), *Revised performance standards for radar equipment*

IMO MSC.232(82):2006, *Revised Performance standards for electronic chart display and information systems (ECDIS)*

IMO MSC/Circ.982 (2000), *Guidelines on ergonomic criteria for bridge equipment and layout*

IMO SN/Circ.243 (2004), *Guidelines for the Presentation of Navigation-related Symbols, Terms and Abbreviations*

IMO SN.1/Circ.266 (2007), *Maintenance of electronic chart display and information system (ECDIS) software*

IHO M-3:2007, *Resolutions of the IHO, Chapter A, Section 3, Technical Resolution 3.11*

IHO S-32, appendix 1, *Hydrographic dictionary – Glossary of ECDIS related terms*

IHO S-52:1996, *Specifications for chart content and display aspects of ECDIS*

IHO S-52, appendix 1:1996, *Guidance on updating the electronic navigational chart*

IHO S-52, appendix 2:2004 *Colour and symbol specifications for ECDIS*

IHO S-57, appendix B.1: 2000, *ENC product specification*

IHO S-61:1999, *Product specification for raster navigational charts (RNC)*

IHO S-63:2008, *IHO data protection scheme*

IHO S-64, *Test data sets for ECDIS*

3 Terms, definitions and abbreviations

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

3.1 Definitions

3.1.1

appropriate portfolio of up to date paper charts (APC)

(232/App.7 3.7) *a suite of paper charts of a scale to show sufficient detail of topography, depths, navigational hazards, aids to navigation, charted routes, and routing measures to provide the mariner with information on the overall navigational environment. The APC should provide adequate look-ahead capability. Coastal States will provide details of the charts which meet the requirement of this portfolio, and these details are included in a worldwide database maintained by the IHO. Consideration should be given to the details contained in this database when determining the content of the APC*

3.1.2

CIE colour calibration

procedure to confirm that the colour specified in S-52, appendix 2 is correctly reproduced on the ECDIS display

3.1.3

common reference system

sensor input data, providing identical and obligatory reference pertaining to position, course, heading, bearing, speed, velocity, etc. and horizontal datum to different subsystems within an integrated navigation system

3.1.4

compilation scale

scale with which the chart information meets the IHO requirements for chart accuracy. It is established by the producing hydrographic office and encoded in the ENC

3.1.5

corrupted data

ENC data produced according to the S-57 ENC product specification, but altered or modified during production, transmission, or retrieval

3.1.6

dead-reckoned position

DR

position extrapolated from the last accepted position update, based on present course and speed, and updated on a time interval selected by the operator

3.1.7

degrade

reduce the quantity or quality of information content

3.1.8

display base

(232/A3.5) *the chart content as listed in Annex A and which cannot be removed from the display. It is not intended to be sufficient for safe navigation*

3.1.9

display redraw time

interval from when the display starts to change until the new display is complete

3.1.10

display regeneration time

interval from operator action until the consequent redraw is complete

3.1.11**display scale**

ratio between a distance on the display and a distance on the ground, normalized and expressed as, for example 1:10 000

3.1.12**electronic chart display and information system (ECDIS)**

(232/A3.1) *a navigation information system which with adequate backup arrangements can be accepted as complying with the up-to-date chart required by regulation V/19 and V/27 of the 1974 SOLAS Convention, as amended, by displaying selected information from a system electronic navigational chart (SENC) with positional information from navigation sensors to assist the mariner in route planning and route monitoring, and if required display additional navigation-related information*

3.1.13**electronic navigation chart (ENC)**

(232/A3.2) *the database, standardized as to content, structure and format, issued for use with ECDIS by or on the authority of a Government authorized Hydrographic Office or other relevant government institution, and conform to IHO standards. The ENC contains all the chart information necessary for safe navigation and may contain supplementary information in addition to that contained in the paper chart (for example sailing directions) which may be considered necessary for safe navigation*

3.1.14**ENC cell**

geographic division of ENC data for distributing purposes. For further information, refer to the ENC product specification in S-57

3.1.15**ENC data**

data conforming to 3.1.13

3.1.16**ENC test data set**

standardized data set supplied on behalf of the IHO that is necessary to accomplish IEC testing requirements for ECDIS. This data set is encoded according to the S-57 ENC product specification and contains update information based on S-52, appendix 1. The specific requirements are listed in Annex E

3.1.17**estimated position (EP)**

position of own ship determined by the common intersection of two LOPs

3.1.18**fix**

position of own ship determined, without reference to any former position, by the common intersection of three or more LOPs

3.1.19**line of position (LOP)**

plotted line on which own ship is located determined by observation or measurement of the range or bearing to an aid to navigation or other charted element

3.1.20

non-ENC data

data not conforming to 3.1.13

3.1.21

overscale

display of the chart information at a display scale larger than the compilation scale. Overscaling may arise from deliberate overscaling by the mariner, or from automatic overscaling by ECDIS in compiling a display when the data included is at various scales

3.1.22

presentation library

implementation of the display specifications in S-52, appendix 2 “Colour and Symbol Specifications for ECDIS”, by de-coding and symbolizing the SENC. It contains:

- a) the ECDIS symbol library for chart features;
- b) the ECDIS colour tables for day, dusk, and night viewing;
- c) look-up tables, linking ENC objects to the appropriate colour and symbology;
- d) conditional symbology procedures for
 - cases where symbolizing depends on circumstances, such as the mariner’s choice of safety contour, date or time;
 - cases where symbolizing is too complex to be defined in a direct look-up table;
- e) description of symbology instructions;
- f) supplementary features, for example ECDIS chart 1 colour differentiation test diagrams and colour calibration software

3.1.23

raster chart display system (RCDS)

(232/App.7 3.1) *a navigation information system displaying RNCs with positional information from navigation sensors to assist the mariner in route planning and route monitoring and, if required, display additional navigation-related information*

3.1.24

raster navigational chart (RNC)

(232/App.7 3.2) *a facsimile of a paper chart originated by, or distributed on the authority of, a government-authorized hydrographic office. RNC is used in these standards to mean either a single chart or a collection of charts*

3.1.25

RNC data

data conforming to 3.1.24

3.1.26

RNC test data set

standardized data set supplied on behalf of the IHO that is necessary to accomplish IEC testing requirements for RCDS mode of operation. This data set is encoded according to the S-61 RNC product specification. Test RNCs are specified by the HO providing the RNC service or on whose behalf the RNC service is provided

3.1.27

single operator action

single operation shall be achieved by activating a hardkey or softkey, including any necessary cursor movement