



SLOVENSKI STANDARD

SIST EN 60945:1997

01-november-1997

Maritime navigation and radiocommunication equipment and systems - General requirements - Methods of testing and required test results (IEC 945:1996)

Maritime navigation and radiocommunication equipment and systems - General requirements - Methods of testing and required test results

Navigations- und Funkkommunikationsgeräte und -systeme für die Seeschifffahrt - Allgemeine Anforderungen - Prüfverfahren und geforderte Prüfergebnisse

Matériels et systèmes de navigation et de radiocommunication maritimes - Spécifications générales - Méthodes d'essai et résultats exigibles

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Ta slovenski standard je istoveten z: EN 60945:1997

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47.020.70	Navigacijska in krmilna oprema	Navigation and control equipment

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EUROPEAN STANDARD
 NORME EUROPÉENNE
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Descriptors: Ship, navigational instruments, general requirements, methods of testing, environmental conditions, required test results

English version

**Maritime navigation and radiocommunication equipment and systems
 General requirements - Methods of testing and required test results
 (IEC 945:1996)**

Matériels et systèmes de navigation et
 de radiocommunication maritimes
 Spécifications générales - Méthodes
 d'essai et résultats exigibles
 (CEI 945:1996)

Navigationsgeräte für die Seeschifffahrt
 Allgemeine Anforderungen
 Prüfverfahren und geforderte
 Prüfergebnisse
 (IEC 945:1996)

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European Committee for Electrotechnical Standardization
 Comité Européen de Normalisation Electrotechnique
 Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

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Ref. No. EN 60945:1997 E

Foreword

The text of document 80/124/FDIS, future edition 3 of IEC 945, prepared by IEC TC 80, Maritime navigation and radiocommunication equipment and systems, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60945 on 1996-12-09.

This European Standard supersedes EN 60945:1995.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1997-09-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1997-09-01

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annexes A and ZA are normative and annexes B to G are informative. Annex ZA has been added by CENELEC.

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Endorsement notice
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The text of the International Standard IEC 945:1996 was approved by CENELEC as a European Standard without any modification.

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In the official version, for annex F Bibliography, the following notes have to be added for the standards indicated:

- | | |
|-------------|--|
| IEC 68-2-32 | NOTE: Harmonized, together with its amendment 2:1990, as EN 60068-2-32:1993 (not modified). |
| IEC 73 | NOTE: Harmonized as EN 60073:1993, which is superseded by EN 60073:1996 and its corrigendum April 1993 (not modified). |
| IEC 721-2-1 | NOTE: Harmonized, together with its amendment 1:1987, as HD 478.2.1 S1:1989 (not modified). |
| IEC 721-2-4 | NOTE: Harmonized, together with its amendment 1:1988, as HD 478.2.4 S1:1989 (not modified). |
| IEC 721-3-6 | NOTE: Harmonized, together with its amendment 1:1991, as EN 60721-3-6:1993 (not modified). |



Annex ZA (normative)

Normative references to international publications
with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE: When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 50(161)	1990	International Electrotechnical Vocabulary (IEV) Chapter 161: Electromagnetic compatibility	-	-
IEC 68-2-1	1990	Environmental testing Part 2: Tests - Tests A: Cold	EN 60068-2-1	1993
A1	1993		A1	1993
A2	1994		A2	1994
IEC 68-2-2	1974	Part 2: Tests - Test B: Dry heat	EN 60068-2-2 ¹⁾	1993
A1	1993		A1	1993
A2	1994		A2	1994
IEC 68-2-5	1975	Part 2: Tests - Test Sa: Simulated solar radiation at ground level	HD 323.2.5 S1	1988
IEC 68-2-6	1995	Part 2: Tests - Test Fc: Vibration (sinusoidal)	EN 60068-2-6 ²⁾	1995
IEC 68-2-9	1975	Part 2: Tests - Guidance for solar radiation testing	HD 323.2.9 S2 ³⁾	1987
IEC 68-2-30	1980	Part 2: Tests - Test Db and guidance: Damp heat, cyclic (12 + 12 hour cycle)		
+ A1	1985		HD 323.2.30 S3	1988
IEC 68-2-48	1982	Part 2: Tests - Guidance on the application of the tests of IEC publication 68 to simulate the effects of storage	HD 323.2.48 S1	1988
IEC 68-2-52	1984	Part 2: Tests - Test Kb: Salt mist, cyclic (sodium chloride solution)	HD 323.2.52 S1 ⁴⁾	1987

1) EN 60068-2-2 includes supplement A:1976 to IEC 68-2-2.

2) EN 60068-2-6 includes the corrigendum March 1995 to IEC 68-2-6.

3) HD 323.2.9 S2 includes A1:1984 to IEC 68-2-9.

4) HD 323.2.52 S1 is superseded by EN 60068-2-52:1996, which is based on IEC 68-2-52:1996.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 71-2	1976	Insulation co-ordination Part 2: Application guide	HD 540.2 S1 ⁵⁾	1991
IEC 92-101	1994	Electrical installations in ships Part 101: Definitions and general requirements	-	-
IEC 92-504	1994	Part 504: Special features - Control and instrumentation	-	-
IEC 417	1973	Graphical symbols for use on equipment Index, survey and compilation of the single sheets	HD 243 S12 ⁶⁾	1995
IEC 529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr. May	1991 1993
IEC 533	1977	Electromagnetic compatibility of electrical and electronic installations in ships	-	-
IEC 651 A1	1979 1993	Sound level meters	EN 60651 A1	1994 1994
IEC 1000-4-2	1995	Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques Section 2: Electrostatic discharge immunity test - Basic EMC publication	EN 61000-4-2	1995
IEC 1000-4-3 (mod)	1995	Section 3: Radiated, radio-frequency, electromagnetic field immunity test	EN 61000-4-3	1996
IEC 1000-4-4	1995	Section 4: Electrical fast transient/burst immunity test - Basic EMC publication	EN 61000-4-4	1995
IEC 1000-4-5	1995	Section 5: Surge immunity test	EN 61000-4-5	1995
IEC 1000-4-6	1996	Section 6: Immunity to conducted disturbances, induced by radio-frequency fields	EN 61000-4-6	1996
IEC 1000-4-11	1994	Section 11: Voltage dips, short interruptions and voltage variations immunity tests	EN 61000-4-11	1994

5) HD 540.2 S1 is superseded by EN 60071-2:1996, which is based on IEC 71-2:1996.

6) HD 243 S12 includes supplements A:1974 to M:1994 to IEC 417.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 1097-4	1994	Global maritime distress and safety system (GMDSS) Part 4: INMARSAT-C ship earth station and INMARSAT enhanced group call (EGC) equipment - Operational and performance requirements, methods of testing and required test results	-	-
CISPR 16-1	1993	Specification for radio disturbance and immunity measuring apparatus and methods Part 1: Radio disturbance and immunity measuring apparatus	-	-
ISO/R 694	1968	Positioning of magnetic compasses in ships	-	-
ISO 3791	1976	Office machines and data processing equipment - Keyboard layouts for numeric applications	-	-
IMO	1993	IMO Convention for Safety of Life at Sea (SOLAS)	-	-
IMO	1977	IMO Convention for the Safety of Fishing Vessels (SFA)	-	-
IMO Resolution A.574	1988	Recommendation on general requirements for electronic navigational aids https://standards.iteh.ai/catalog/standards/sist/8816e9ea-b73a-45ba-9d2a-8d9924ebd1a3/sist-en-60945-1997	-	-
IMO Resolution A.694	1991	General requirements for shipborne radio equipment forming part of the global maritime distress and safety system and for electronic navigational aids	-	-
IMO Resolution A.803	1995	Performance standards for shipborne VHF radio installations capable of voice communication and digital selective calling	-	-
IMO Resolution A.813	1995	General requirements for electromagnetic compatibility (EMC) for all electrical and electronic ship's equipment	-	-
ITU-T Recommendation E.161	1993	Arrangement of digits, letters and symbols on telephones and other devices that can be used for gaining access to a telephone network	-	-

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NORME
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Troisième édition
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1996-11

**Matériels et systèmes de navigation
et de radiocommunication maritimes –**

**Spécifications générales –
Méthodes d'essai et résultats exigibles**

iTeh STANDARD PREVIEW

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**Maritime navigation and radiocommunication
equipment and systems –**

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General requirements –

Methods of testing and required test results

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CONTENTS

	Page
FOREWORD.....	9
INTRODUCTION.....	11
Clause	
1 Scope.....	13
2 Normative references.....	13
3 Definitions and abbreviations.....	19
4 Minimum performance requirements.....	21
4.1 General.....	21
4.2 Operation.....	21
4.3 Power supply.....	27
4.4 Durability and resistance to environmental conditions.....	27
4.5 Interference – Electromagnetic compatibility.....	27
4.6 Interference – Acoustic noise.....	29
4.7 Interference – Compass safe distance.....	29
4.8 Safety precautions.....	29
4.9 Maintenance.....	31
4.10 Equipment manuals.....	31
4.11 Marking and identification.....	31
5 Methods of testing and required test results.....	33
5.1 General.....	33
5.2 Test conditions.....	35
5.3 Test results.....	37
6 Operational checks (all equipment categories).....	37
6.1 General.....	37
6.2 Design of control facilities.....	39
6.3 Use of controls.....	39
6.4 Identification.....	41
6.5 Illumination.....	41
6.6 Damage and safety.....	43
6.7 Inter-unit connection.....	43
6.8 Digital panels.....	43
6.9 Indicator.....	43
6.10 Software.....	45
7 Power supply – Methods of testing and required test results.....	45
7.1 Extreme power supply.....	45
7.2 Excessive conditions.....	45
7.3 Power supply short-term variation.....	45
7.4 Power supply failure.....	45

Clause	Page
8 Durability and resistance to environmental conditions – Methods of testing and required test results	45
8.1 General	45
8.2 Dry heat	49
8.3 Damp heat	51
8.4 Low temperature	51
8.5 Thermal shock (portable equipment)	53
8.6 Drop (portable equipment)	55
8.7 Vibration (all equipment categories)	55
8.8 Rain (exposed equipment)	57
8.9 Immersion	59
8.10 Solar radiation (portable equipment)	61
8.11 Oil resistance (portable equipment)	63
8.12 Corrosion (salt mist) (all equipment categories)	63
9 Unwanted electromagnetic emission – Methods of testing and required test results ...	65
9.1 General	65
9.2 Conducted emissions (all equipment categories except portable)	65
9.3 Radiated emissions from enclosure port (all equipment categories except submerged)	67
10 Immunity to electromagnetic environment – Methods of testing and required test results	69
10.1 General	69
10.2 Immunity to conducted low-frequency interference (all equipment categories except portable)	73
10.3 Immunity to conducted radiofrequency interference (all equipment categories except portable)	73
10.4 Immunity to radiated radiofrequencies (all equipment categories except submerged)	75
10.5 Immunity to fast transients on a.c. power, signal and control lines (all equipment categories except portable)	77
10.6 Immunity to surges on a.c. power lines (all equipment categories except portable)	77
10.7 Immunity to power supply short-term variation (all equipment categories except portable)	79
10.8 Immunity to power supply failure (all equipment categories except portable)	79
10.9 Immunity to electrostatic discharge (all equipment categories except submerged)	79
11 Special purpose tests – Methods of testing and required test results	81
11.1 Acoustic noise and signals (all equipment intended for installation in wheelhouses and bridge wings)	81
11.2 Compass safe distance (all equipment categories except submerged)	83
12 Safety precautions – Methods of testing and required test results (all equipment categories)	83
12.1 Protection against accidental access to dangerous voltages	83
12.2 Electromagnetic radiofrequency radiation	85

Clause	Page
12.3 Emission from visual display unit (VDU).....	85
12.4 X-radiation	87
13 Maintenance (all equipment categories).....	87
14 Equipment manuals (all equipment categories)	87
15 Marking and identification (all equipment categories)	87
Figures	
1 Examples of ports referred to in electromagnetic emission and immunity tests	88
2 Radiofrequency terminal voltage limits for conducted emissions.....	89
3 Artificial mains network for tests for conducted emissions	90
4 Limiting values for radiated emissions from enclosure ports	91
5 Arrangement for testing immunity to conducted low-frequency interference	92
6 Test voltage for immunity to conducted low-frequency interference	93
7 Schematic setup for immunity test to conducted radiofrequency interference.....	94
8 Example of a simplified diagram for CDN used with unscreened supply (mains) lines, in tests for conducted radiofrequency interference	95
9 Example of suitable test facility for immunity to radiated radiofrequencies	96
10 General test setup for immunity to fast transient/burst	97
11 Test setup for immunity to surges on power lines.....	98
12 Power supply variations for tests of immunity to power supply short-term transients ..	99
13 Example of test setup for floor-standing equipment, for tests of immunity to electrostatic discharge (ESD) showing typical positions of the ESD generator	100
14 Example of test setup for table-top equipment, for tests of immunity to electrostatic discharge (ESD) showing typical positions of the ESD generator	101
Annexes	
A IMO Resolution A.694(17).....	103
B Environmental conditions for ships.....	113
C EMC requirements for ships	119
D Examples of equipment by environmental class	129
E Glossary of subjective phrases used by IMO and copied in this standard.....	131
F Bibliography	135
G Cross-references between the requirements of IMO Resolution A.694 and the tests/checks in this standard	139

INTERNATIONAL ELECTROTECHNICAL COMMISSION

MARITIME NAVIGATION AND RADIOCOMMUNICATION
EQUIPMENT AND SYSTEMS –

General requirements – Methods of testing and required test results

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 945 has been prepared by IEC technical committee 80: Maritime navigation and radiocommunication equipment and systems.

This third edition cancels and replaces the second edition published in 1994 and constitutes a technical revision.

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

FDIS	Report on voting
80/124/FDIS	80/137/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.

Annex A forms an integral part of this standard.

Annexes B, C, D, E, F and G are for information only.

INTRODUCTION

IEC 945 was originally produced to give test methods and, where appropriate, limit values to the IMO Resolution A.574(14) which was a recommendation on general requirements for electronic navigational aids. (It has subsequently been replaced, see below.) The tests dealing with electromagnetic immunity could not be produced in time for the publication of the original standard, and these were added later in 1992 as Amendment 1.

In 1991 the IMO, when discussing the changes that would arise with the introduction of the global maritime distress and safety system (GMDSS), noted that in future, radio equipment would be installed on the bridge of a vessel alongside the navigation equipment instead of in a special radio room as hitherto. The IMO consequently withdrew Resolution A.574(14), and a corresponding Resolution A.569(14) dealing with the general requirements of radio equipment, and replaced them with IMO Resolution A.694(17). A second edition of IEC 945 was rapidly prepared to reflect this change.

This third edition of IEC 945 is a complete revision of the second edition. The scope has been extended to make the standard applicable additionally to other equipment installed on and around the bridge of a ship with regard to EMC.

Operational tests which involve subjective judgements have been better defined, and guidance given on the qualifications required of personnel to make subjective tests. General test methods have been added, together with summaries of test conditions.

A new class of equipment – "portable" – has been added to the existing "protected", "exposed" and "submerged" classes to better define the requirements particularly of the life saving appliances of Chapter III of SOLAS. The old class nomenclature of "B", "X" and "S" has, however, been dropped, together with the class labelling requirement which was considered to be no longer useful. The environmental tests have been revised to align with any appropriate section of IEC 68-2, but the test for mould growth has been deleted, as it was considered to be no longer relevant to modern materials.

Noting the universal reliance on software of modern equipments, clauses describing operational and durability aspects of software have been added.

EMC tests have been aligned with the latest test methods of CISPR 16-1 and IEC 1000-4, and summary tables have been added, together with an explanatory annex on EMC requirements.

This standard has been aligned, wherever possible, with the requirements of classification societies.

MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS –

General requirements – Methods of testing and required test results

1 Scope

This International Standard assists in meeting a requirement of the International Convention for Safety of Life at Sea (SOLAS), adopted by the International Maritime Organization (IMO), that the radio equipment defined in chapters III and IV, and the navigation equipment defined in chapter V of the Convention, be type-approved by administrations to conform with performance standards not inferior to those adopted by the IMO. (Administrations are defined by the IMO as governments of the states whose flags the ships are entitled to fly.)

The performance standard for general requirements for shipborne radio equipment and electronic navigation aids that has been adopted by the IMO is given in IMO Resolution A.694 and is reproduced in this standard as annex A, which forms the basis for this standard. Reference is made, where appropriate, to IMO Resolution A.694, and all subclauses whose wording is identical to that in the resolution are printed in italics.

This standard specifies minimum performance requirements, methods of testing and required test results for general requirements which can be applied to those characteristics common to all equipment described hereunder:

- a) shipborne radio equipment forming part of the global maritime distress and safety system required by the International Convention for Safety of Life at Sea (SOLAS) as amended, and by the 1993 Protocol to the 1977 Safety of Fishing Vessels Convention;
- b) shipborne navigational equipment required by the International Convention for Safety of Life at Sea (SOLAS), as amended, and by the 1993 Protocol to the 1977 Safety of Fishing Vessels Convention, and to other navigational aids, where appropriate; and
- c) for EMC only, all other bridge-mounted equipment, equipment in close proximity to receiving antennas, and equipment capable of interfering with safe navigation of the ship and with radio-communications (see IMO Resolution A.813).

NOTE – For EMC, this standard is in the IEC category product family.

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 normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.