

Marine navigational equipment – General requirements – Methods of testing and required test results

The European Standard EN 60945 : 1993 has the status of a
British Standard

Appareils de navigation maritime –
Spécifications générales – Méthodes d'essai et
résultats exigibles

Navigationsgeräte für die Seeschifffahrt –
Allgemeine Anforderungen – Prüfverfahren und
geforderte Prüfergebnisse

UDC 656.6 : 527 : 621.396.96

Amendment No. 1
published and effective from 15 November 1993
to BS 7169 : 1989

Specification for general requirements for marine navigational equipment

NOTE. The European Committee for Electrotechnical Standardization (CENELEC) has accepted IEC 945 : 1988 as a European Standard designated as EN 60945 : 1993. This amendment implements EN 60945 : 1993 as a British Standard in the BS EN series.

Implementation of European Standard

Front cover

Delete the existing cover page and substitute the attached.

AMD 8033/November 1993

National foreword

At the end of paragraph 1 insert the following new paragraph.

'In 1993 the European Committee for Electrotechnical Standardization (CENELEC) accepted IEC 945 : 1988 as European Standard EN 60945 : 1993. As a consequence of implementing the European Standard this British Standard is renumbered as BS EN 60945 and any reference to BS 7169 should be read as a reference to BS EN 60945.'

AMD 8033/November 1993

New EN title page and foreword

Immediately after the national foreword, insert the attached new EN title page and foreword page.

AMD 8033/November 1993

New annex ZA

Insert the attached new annex ZA after figure 3.

AMD 8033/November 1993

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English version

Marine navigational equipment – General requirements – Methods of testing and required test results

(IEC 945 : 1988)

Appareils de navigation maritime – Spécifications générales – Méthodes d'essai et résultats exigibles
(CEI 945 : 1988)

Navigationsgeräte für die Seeschifffahrt – Allgemeine Anforderungen – Prüfverfahren und geforderte Prüfergebnisse
(IEC 945 : 1988)

This European Standard was approved by CENELEC on 1993-07-06. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

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

Foreword

At the request of 73rd Technical Board, HD 552 S1 : 1989 (IEC 945 : 1988) was submitted to the CENELEC voting procedure for conversion into a European Standard.

The text of the International Standard was approved by CENELEC as EN 60945 on 6 July 1993.

The following dates were fixed:

- latest date of publication of
an identical national standard (dop) 1994-03-01
- date of withdrawal of
conflicting national standards (dow) –

Annexes designated 'normative' are part of the body of the standard. In this standard, annex ZA is normative.

Annex ZA (normative)

Other international publications quoted in this standard with the references of the relevant European publications

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

IEC Publication	Date	Title	EN/HD	Date
50 (902)	1973	<i>International Electrotechnical Vocabulary (IEV) Chapter 902: Radio interference</i>	–	–
417	1973	<i>Graphical symbols for use on equipment Index, survey and compilation of the single sheets</i>	HD 243 S10*	1993
529	1976	<i>Classification of degrees of protection provided by enclosures</i>	HD 365 S3*	1985
651	1979	<i>Sound level meters</i>	HD 425 S1	1983
CISPR 16	1987	<i>C.I.S.P.R. specification for radio interference measuring apparatus and measurement methods</i>	–	–

Other publication quoted:

ISO/R 694	1968	<i>Positioning of magnetic compasses in ships</i>
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*HD 243 S10 includes supplements A: 1974 to K: 1991 to IEC 417

HD 365 S3 is superseded by EN 60529 : 1991, which is based on IEC 529 : 1989 – *Degrees of protection provided by enclosures (IP Code)*.

Amendment No. 1
published and effective from 15 December 1993
to BS EN 60945 : 1993

Marine navigational equipment – General requirements –
Methods of testing and required test results

NOTE. The English language version of European Standard EN 60945 was implemented in the United Kingdom by the amendment of BS 7169 : 1989 which was renumbered as BS EN 60945 : 1993. This amendment implements amendment A1 to EN 60945.

This amendment together with the European Standard EN 60945 : 1993 has the status of a British Standard.

Revised text

National foreword (as amended by Amendment No. 1 to BS 7169)

In paragraph 1, line 3, after 'results,' insert 'as amended by Amendment No. 1 : 1993'.

At the end of paragraph 2, insert the following new paragraph.

'Annex A is technically equivalent to BS 7027 : 1990. Specification for limits and methods of measurement of the immunity of marine electrical and electronic equipment to conducted and radiated electromagnetic interference.'

AMD 8061/December 1993

EN amendment title page and foreword

Insert the attached EN amendment title page (foreword on reverse).

AMD 8061/December 1993

Text of EN 60945

Amend the text of European Standard EN 60945 in accordance with the details given on the attached pages.

AMD 8061/December 1993

UDC 656.6 : 527 : 621.396.96

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

Amendment A1 to the English version of EN 60945

**Marine navigational equipment
General requirements
Methods of testing and required test results**

(IEC 945 : 1988/A1 : 1992)

Appareils de navigation maritime
Spécifications générales
Méthodes d'essai et résultats exigibles
(CEI 945 : 1988/A1 : 1992)

Navigationsgeräte für die
Seeschifffahrt – Allgemeine
Anforderungen – Prüfverfahren und geforderte
Prüfergebnisse
(IEC 945 : 1988/A1 : 1992)

This amendment A1 modifies the European Standard EN 60945 : 1993. It was approved by CENELEC on 1993-07-06. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

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

Foreword

The CENELEC questionnaire procedure, performed for finding out whether or not amendment 1 : 1992 to the international standard IEC 945 : 1988 could be accepted without textual changes, has shown that no common modifications were necessary for the acceptance as European Standard.

The reference document was submitted to the CENELEC members for formal vote and was approved by CENELEC as amendment A1 to EN 60945 on 6 July 1993.

The following dates were fixed:

- latest date of publication of
an identical national
standard (dop) 1994-03-01
- latest date of withdrawal of
conflicting national
standards (dow) 1994-03-01

CONTENTS

Add, after "FIGURES", the following new annex:

**Annex A (normative) – Immunity to electromagnetic environment – Methods of testing
and required test results**

17 Interference

Replace the existing subclause 17.5, by the following new subclause:

17.5 Immunity to electromagnetic environment

Equipment shall be so designed as to operate according to the relevant performance specification in the electromagnetic environment normally found on board ships.

The environmental levels are specified, together with the methods of testing in annex A (normative).

Add, after figure 3, the following new annex A:

Annex A
(normative)

**Immunity to electromagnetic environment –
Methods of testing and required test results**

A.1 Scope

This annex specifies limits and describes methods of measurement of the immunity of equipment to conducted and radiated interference. It also specifies tests for determining the compliance of the equipment with the manufacturer's specification, the equipment being tested in a laboratory or similar facility under defined conditions.

Equipment is classified into two categories:

- a) that which is installed above deck or in areas of potentially high electromagnetic interference;
- b) that which is installed in metal compartments or within a ship which affords natural screening.

Differing limits are specified in each case where relevant.

A.2 Measurements

A.2.1 Screened room

The tests shall be carried out within a screened room to eliminate the effects of extraneous interference and to prevent the RF power from interfering with other users of the spectrum.

The dimensions of the room shall be not less than 2,5 m high x 3 m wide x 5 m long. Power supplies to the room shall be adequately filtered.

A.2.2 Ground plane

A ground plane having an area of not less than 1,5 m² shall be provided within the screened room and bonded to the walls at points not more than 1 m apart.

A.2.3 Artificial mains network

An artificial mains network complying with subclause 8.2.1 or 8.2.2d) of section 2 of CISPR 16, depending on the test frequency, shall be inserted in each line of the power supply to the equipment under test or test sample (EUT). When not in use, the radio frequency terminal of each artificial mains network shall be terminated with a 50 Ω non-reactive resistor. The network shall be mounted either on the ground plane or on the enclosure, and bonded to it.

