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INTERNATIONAL STANDARD

Electrical installations in ships –
Part 379: Symmetrical category cables with transmission characteristics up to 1 000 MHz

IEC 60092-379:2024-07(en)

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ELECTRICAL INSTALLATIONS IN SHIPS –

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FOREWORD

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IEC 60092-379 has been prepared by subcommittee 18A: Electric cables for ships and mobile and fixed offshore units, of IEC technical committee 18: Electrical installations of ships and of mobile and fixed offshore units. It is an International Standard.

The text of this International Standard is based on the following documents:

Draft	Report on voting
18A/487/FDIS	18A/489/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 60092 series, published under the general title *Electrical installations in ships*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

ELECTRICAL INSTALLATIONS IN SHIPS –

Part 379: Symmetrical category cables with transmission characteristics up to 1 000 MHz

1 Scope

This part of IEC 60092 is applicable to shipboard and offshore units Ethernet (category) cables with extruded solid or foamed insulation, intended for fixed installations. Cables designed to maintain functional integrity during fire as specified in 6.1 and to be installed in explosive atmospheres as specified in 6.2 are included.

The various types of Ethernet (category) cables are given in Clause 4. The constructional requirements and test methods are aligned with those indicated in IEC 60092-350, unless otherwise specified in this document.

The object of this document is:

– to standardize cables whose safety and reliability is ensured when they are installed in accordance with the requirements of IEC 60092-352 or IEC 60092-401;

– to allow solid conductor category cables against the recommendations of IEC 60092-352;

– to lay down standard manufacturing requirements and characteristics of such cables directly or indirectly bearing on safety;

– to specify test methods for checking conformity with those requirements; and

– to add requirements and recommendations for the cable installation in accordance with Annex A.

All cables described in this document are halogen-free.

Cables within this document can be installed in many different environments that would call for extra protection where steel wire or tape armouring is required. Examples of areas, such as outdoor, on the ship, where other moveable objects are within the same space, will require extra protection. These areas of concern are found in extreme conditions, like offshore drilling and oil platforms.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60079-14:2013, *Explosive atmospheres – Part 14: Electrical installations design, selection and erection*

IEC 60092-350:2020, *Electrical installations in ships – Part 350: General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications*

IEC 60092-352, *Electrical installations in ships – Part 352: Choice and installation of electrical cables*

IEC 60092-360, *Electrical installations in ships – Part 360: Insulating and sheathing materials for shipboard and offshore units, power, control, instrumentation and telecommunication cables*

IEC 60092-401, *Electrical installations in ships – Part 401: Installation and test of completed installation*

IEC 60331-1, *Tests for electric cables under fire conditions – Circuit integrity – Part 1: Test method for fire with shock at a temperature of at least 830 °C for cables of rated voltage up to and including 0,6/1,0 kV and with an overall diameter exceeding 20 mm*

IEC 60331-2, *Tests for electric cables under fire conditions – Circuit integrity – Part 2: Test method for fire with shock at a temperature of at least 830 °C for cables of rated voltage up to and including 0,6/1,0 kV and with an overall diameter not exceeding 20 mm*

IEC 60331-23, *Tests for electric cables under fire conditions – Circuit integrity – Part 23: Procedures and requirements – Electric data cables*

IEC 60332-3-24, *Tests on electric and optical fibre cables under fire conditions – Part 3-24: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category C*

IEC 60332-3-25, *Tests on electric and optical fibre cables under fire conditions – Part 3-25: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category D*

IEC 60332-1-2, *Tests on electric and optical fibre cables under fire conditions – Part 1-2: Test for vertical flame propagation for a single insulated wire or cable – Procedure for 1 kW pre-mixed flame*

IEC 60684-2, *Flexible insulating sleeving – Part 2: Methods of test*

IEC 60754-1, *Test on gases evolved during combustion of materials from cables – Part 1: Determination of the halogen acid gas content*

IEC 60754-2, *Test on gases evolved during combustion of materials from cables – Part 2: Determination of acidity (by pH measurement) and conductivity*

IEC 60811-506, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 506: Mechanical tests – Impact test at low temperature for insulations and sheaths*

IEC 61034-2*, Measurement of smoke density of cables burning under defined conditions – Part 2: Test procedure and requirements*

IEC 61156-1:2023, *Multicore and symmetrical pair/quad cables for digital communications – Part 1: Generic specification*

IEC 61156-5:2020, *Multicore and symmetrical pair/quad cables for digital communications – Part 5: Symmetrical pair/quad cables with transmission characteristics up to 1 000 MHz – Horizontal floor wiring – Sectional specification*

IEC 61156-6:2020, *Multicore and symmetrical pair/quad cables for digital communications – Part 6: Symmetrical pair/quad cables with transmission characteristics up to 1 000 MHz – Work area wiring – Sectional specification*

ISO/IEC TS 29125, *Information technology – Telecommunications cabling requirements for remote powering of terminal equipment*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60092-350 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

4 General requirements

4.1 Temperature range of the cables

The category cables, specified in this document, are decided for an operating temperature range from −25 °C up to +80 °C.

NOTE The specified temperature range is extended compared to the range specified in the IEC 61156 series.

Another temperature range can be agreed between manufacturer and customer. In this case ensure that the temperature coefficient of the attenuation should be specified in order to provide this information for network-planning purposes.

4.2 Rated voltage

The rated voltages for category cables are

- 30 V AC for cables with Ethernet data transmission only;
- 57 V AC for cables with Ethernet data transmission and additional Power over Ethernet (PoE) characteristics.

All voltages are given as RMS values.

If cables are used including Power over Ethernet the production and installation shall be in accordance with ISO/IEC TS 29125.

NOTE 1 For Power over Ethernet characteristics and application see the following standards:

- 2-pair PoE (ISO/IEC/IEEE 802.3cq-2020)
- 2-pair PoE+ (ISO/IEC/IEEE 802.3cv-2021)
- 4-pair PoE++ (ISO/IEC/IEEE 802-3:2021/AMD2:2021)

NOTE 2 PoE+ and PoE++ are not official terms.

NOTE 3 The detailed voltage range of a PoE cable is:

- PoE Type1: 44 V - 57 V, DC
- PoE Type2: 50 V- 57 V, DC
- PoE Type3&4: 52 V- 57 V, DC

4.3 Transmission (category) parameters

4.3.1 General

The transmission (category) class shall be defined in accordance with IEC 61156-5 (horizontal wiring) or IEC 61156-6 (work area wiring).