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## INTERNATIONAL STANDARD



Electrical installations in ships – Part 353: Power cables for rated voltages 1 kV and 3 kV

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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## CONTENTS

FOREWORL	)	4
1 Scope	and object	6
2 Normat	ve references	6
3 Terms a	and definitions	7
4 Genera	l requirements	7
4.1 R	ated voltage	7
	arkings	
4.2.1	Indication of origin and voltage identification	
4.2.2	Continuity of marking	
4.2.3	Core identification	8
5 Constru	ctional requirements	8
5.1 G	eneral description	8
5.1.1	Overview	8
5.1.2	Unarmoured cables (excluding 1,8/3 kV)	9
5.1.3	Armoured cables	9
5.2 C	onductors	10
5.3 In	sulation	10
5.3.1	Material	10
5.3.2	Application	10
5.3.3	Thickness of insulation	10
5.4 Ca	abling (including fillers and binders)	11
5.5 In	ner covering	
5.5.1	General	
5.5.2	Thickness of inner covering	
5.6 Sc	creen	
5.6.1	Construction	
5.6.2	Application	
	ner sheath	
5.7.1	Material	
5.7.2	Application	
5.7.3	Thickness of inner sheath	
	aid armour	
5.8.1	General	_
5.8.2	Braid wire diameter	
5.8.3	Coverage density	
5.8.4	Application of the armour	
5.9 O 5.9.1	uter sheath	
5.9.1 5.9.2		
5.9.2	Application Thickness of outer sheath	
5.9.3 5.9.4	Colour of outer sheath	
	onstruction for special applications	
5.10.1	Cables for installation in areas with explosive atmospheres	
5.10.1	Cables for installation between areas with and without explosive	13
0.10.2	atmospheres	15
6 Tests -	Methods and requirements	
	ormative) Alternative enhanced insulation thickness for 0.6/1 kV	

Annex BA (informative) Identification of cores of multicore cables	20
BA.1 Inscription	20
BA.2 Arrangement of the marks	20
BA.3 Spacing and dimensions of the marks	20
BA.4 Appearance of inscription	21
Bibliography	22
Figure BA.1 – Arrangement of the marks	20
Table 1 – Insulation thickness	11
Table 2 – Thickness of extruded inner covering and fictitious diameters	12
Table 3 – Requirements of drain wire	12
Table 4 – Tests applicable to all cables	15
Table 5 – Additional tests required for halogen-free cables	17
Table 6 – Additional test required for low smoke cables	17
Table 7 – Additional test required for fire resistant cables	17
Table 8 – Additional tests required for specific performances	17
Table 9 – Additional test for cables for installation between areas with and without explosive atmospheres	18
Table BA.1 – Dimensions of the marks	21

### INTERNATIONAL ELECTROTECHNICAL COMMISSION

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### **ELECTRICAL INSTALLATIONS IN SHIPS -**

### Part 353: Power cables for rated voltages 1 kV and 3 kV

#### **FOREWORD**

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
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- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 60092-353:2016. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

IEC 60092-353 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.

This fifth edition cancels and replaces the fourth edition published in 2016. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) Updated references to IEC 60092-350 for general construction and test methods and IEC 60092-360 for insulating and sheathing materials.
- b) Added subclause 5.10: Construction for special applications.
- c) Added Table 9: Additional test for cables for installation between areas with and without explosive atmospheres.
- d) Deleted the test requirement IEC 60331-21 from Table 7.
- e) Deleted the former Annex A (Alternative enhanced insulation thickness for 0,6/1 kV).

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

Draft	Report on voting
18A/476/CDV	18A/482/RVC

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 <a href="https://www.iec.ch/members\_experts/refdocs">www.iec.ch/members\_experts/refdocs</a>. The main document types developed by IEC are described in greater detail at <a href="https://www.iec.ch/publications">www.iec.ch/publications</a>.

A list of all the parts of the IEC 60092 series, 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

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### **ELECTRICAL INSTALLATIONS IN SHIPS -**

### Part 353: Power cables for rated voltages 1 kV and 3 kV

### 1 Scope and object

This part of IEC 60092 is applicable to shipboard and offshore non radial field power cables with extruded solid insulation, having a voltage rating of 0,6/1 (1,2) kV or 1,8/3 (3,6) kV intended for fixed installations.

Cables designed to maintain circuit integrity during a fire are included.

The various types of power cables are given in 5.1. 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 61892-4,
- to lay down standard manufacturing requirements and characteristics of such cables directly or indirectly bearing on safety, and
- to specify test methods for checking conformity with those requirements.

### 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 60050-461, International Electrotechnical Vocabulary – Part 461: Electric cables

IEC 60079-14:2013 Explosive atmospheres – Part 14: Electrical installations design, selection and erection

IEC 60092-350:<del>2014</del>2020, Electrical installations in ships – Part 350: General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications

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

IEC 60228, Conductors of insulated cables

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 60331-21, Tests for electric cables under fire conditions – Circuit integrity – Part 21: Procedures and requirements – Cables of rated voltage up to and including 0,6/1,0 kV

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 60332-3-22, Tests on electric cables and optical fibre cables under fire conditions – Part 3-22: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category A

IEC 60445, Basic and safety principles for man-machine interface, marking and identification – Identification of equipment terminals, conductor terminations and conductors

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



Edition 5.0 2024-06

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Electrical installations in ships –

Part 353: Power cables for rated voltages 1 kV and 3 kV



## CONTENTS

Г			
1	Scope		6
2	Normativ	e references	6
3	Terms an	d definitions	7
4	General r	equirements	7
		ed voltage	
		kings	
	4.2.1	Indication of origin and voltage identification	
	4.2.2	Continuity of marking	
	4.2.3	Core identification	
5	Construc	tional requirements	8
	5.1 Ger	neral description	8
	5.1.1	Overview	
	5.1.2	Unarmoured cables (excluding 1,8/3 kV)	9
	5.1.3	Armoured cables	
	5.2 Cor	iductors	10
	5.3 Insu	ulation	10
	5.3.1	Material	10
	5.3.2	Application	10
	5.3.3	Thickness of insulation	10
	5.4 Cab	oling (including fillers and binders)	11
	5.5 Inne	er covering	11
	5.5.1	General	11
	5.5.2	Thickness of inner covering	11
	5.6 Scr	een	12
	5.6.1	Construction	
	5.6.2	Application	
		er sheath	
	5.7.1	Material	
	5.7.2	Application	
	5.7.3		13
		id armour	
	5.8.1	General	
	5.8.2	Braid wire diameter	
	5.8.3	Coverage density	
	5.8.4	Application of the armour	
		er sheath	
	5.9.1	Material	
	5.9.2	Application	
	5.9.3	Thickness of outer sheath	
	5.9.4	Colour of outer sheath	
	5.10 Cor 5.10.1	estruction for special applications	
	5.10.1 5.10.2	Cables for installation in areas with explosive atmospheres  Cables for installation between areas with and without explosive	15
	5.10.∠	atmospheres	15
6	Tests – M	lethods and requirements	
Ar		mative) Identification of cores of multicore cables	
	,	,	-

A.1 Inscription		19
A.2 Arrangement	of the marks	19
A.3 Spacing and	dimensions of the marks	19
A.4 Appearance	of inscription	20
Bibliography		21
Figure A.1 – Arrangeme	ent of the marks	19
Table 1 – Insulation thi	ckness	11
Table 2 – Thickness of	extruded inner covering and fictitious diameters	12
Table 3 – Requirements	s of drain wire	12
Table 4 – Tests applica	ble to all cables	15
Table 5 – Additional tes	ts required for halogen-free cables	17
Table 6 – Additional tes	t required for low smoke cables	17
Table 7 – Additional tes	t required for fire resistant cables	17
Table 8 – Additional tes	ts required for specific performances	17
	t for cables for installation between areas with and witho	
Table A.1 – Dimensions	s of the marks	20

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IEC 60228, Conductors of insulated cables

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

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