IEC 60092-354

Edition 4.0 2020-02

REDLINE VERSION

colour inside

Electrical installations in ships – Part 354: Single- and three-core power cables with extruded solid insulation for rated voltages 6 kV (U_m = 7,2 kV) up to 30 kV (U_m = 36 kV)

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 29.060.20; 47.020.60

ISBN 978-2-8322-7863-5

Warning! Make sure that you obtained this publication from an authorized distributor.

® Registered trademark of the International Electrotechnical Commission

CONTENTS

FOREWORD 4
1 Scope 6
2 Normative references 6
3 Terms and definitions 7
4 General requirements 7
4.1 Rated voltage 7
4.2 Markings 7
4.2.1 Indication of origin and voltage identification 8
4.2.2 Continuity of marking 8
4.2.3 Core identification for three-cores 8
5 Constructional requirements 8
5.1 General cable description 8
5.1.1 Overview 8
5.1.2 Armoured single-sheathed cable with outer sheath only 8
5.1.3 Armoured double-sheathed cable with inner and outer sheath 8
5.1.4 Armoured single-sheathed cable with inner sheath only 9
5.1.5 Unarmoured single-sheathed cable 9
5.2 Conductors 9
5.3 Insulation 10
5.3.1 Material 10
5.3.2 Application 10
5.3.3 Thickness of insulation 10
5.4 Screening of cores 10
5.4.1 General 10
5.4.2 Conductor screening 10
5.4.3 Insulation screening 11
5.5 Metallic screen 11
5.5.1 Construction 11
5.5.2 Requirements 11
5.6 Assembly of three-core cables, inner coverings and fillers 11
5.7 Inner covering 11
5.7.1 General 11
5.7.2 Thickness of inner covering 11
5.8 Inner sheath 12
5.8.1 Material 12
5.8.2 Application 12
5.8.3 Thickness of inner sheath 12
5.9 Braid armour 12
5.9.1 General 12
5.9.2 Braid wire armour 13
5.9.3 Braid wire diameter 13
5.10 Outer sheath 13
5.10.1 Material 13
5.10.2 Application 13
5.10.3 Thickness of outer sheath 13
5.10.4 Colour of outer sheath 14

6 Tests – Methods and requirements 14
Annex A (~~informative~~ normative) Electrical tests after installation 17
Bibliography 18

Table 1 – Insulation thickness 10
Table 2 – Thickness of extruded inner covering for calculation of fictious diameters 12
Table 3 –Tests applicable to all cables 14
Table 4 – Additional tests for halogen-free cables 16
Table 5 – Additional test for low smoke cables 16
Table 6 – Additional tests when required 16

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

ELECTRICAL INSTALLATIONS IN SHIPS –

Part 354: Single- and three-core power cables with extruded solid insulation for rated voltages 6 kV (U_m = 7,2 kV) up to 30 kV (U_m = 36 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.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
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.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

DISCLAIMER
This Redline version is not an official Standard and is intended to provide the user with an indication of what changes have been made to the previous version. Only the IEC International Standard provided in this package is to be considered the official Standard.

This Redline version provides you with a quick and easy way to compare all the changes between this standard and its previous edition. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

International Standard IEC 60092-354 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.

This fourth edition cancels and replaces the third edition published in 2014. This edition constitutes a technical revision.

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

a) Editorial adaptations have been made.

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

CDV	Report on voting
18A/419/CDV	18A/424/RVC

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

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

The 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 "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

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

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

ELECTRICAL INSTALLATIONS IN SHIPS –

Part 354: Single- and three-core power cables with extruded solid insulation for rated voltages 6 kV (U_m = 7,2 kV) up to 30 kV (U_m = 36 kV)

1 Scope

This part of IEC 60092 is applicable to shipboard and offshore power cables with extruded solid insulation, conductor and core screening, having a voltage rating of one of the following: 3,6/6 (7,2) kV,6/10 (12) kV, 8,7/15 (17,5) kV, 12/20 (24) kV, 18/30 (36) kV.

NOTE 1 Subclause 4.1 gives more details.

The cables are intended for fixed installations.

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

NOTE 2 Only radial field cables are covered.

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 60038, *IEC standard voltages*

IEC 60228, *Conductors of insulated cables*

IEC 60092-350~~:2014~~:—, *Electrical installations in ships – Part 350: General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications*[1]

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

[1] Under preparation. Stage at the time of publication: IEC/BPUB 60092-350:2019.

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 under fire conditions – Part 3-22: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category A*

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 60885-2, *Electrical test methods for electric cables. Part 2: Partial discharge tests*

IEC 61034-1, *Measurement of smoke density of cables burning under defined conditions – Part 1: Test apparatus*

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

IEC 60092-354

Edition 4.0 2020-02

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Electrical installations in ships – Part 354: Single- and three-core power cables with extruded solid insulation for rated voltages 6 kV (U_m = 7,2 kV) up to 30 kV (U_m = 36 kV)

Installations électriques à bord des navires – Partie 354: Câbles d'énergie unipolaires et tripolaires à isolement massif extrudé pour des tensions assignées allant de 6 kV (U_m = 7,2 kV) jusqu'à 30 kV (U_m = 36 kV)



IEC 60092-354:2020-02(en-fr)

CONTENTS

FOREWORD 4
1 Scope 6
2 Normative references 6
3 Terms and definitions 7
4 General requirements 7
4.1 Rated voltage 7
4.2 Markings 8
4.2.1 Indication of origin and voltage identification 8
4.2.2 Continuity of marking 8
4.2.3 Core identification for three-cores 8
5 Constructional requirements 8
5.1 General cable description 8
5.1.1 Overview 8
5.1.2 Armoured single-sheathed cable with outer sheath only 8
5.1.3 Armoured double-sheathed cable with inner and outer sheath 8
5.1.4 Armoured single-sheathed cable with inner sheath only 9
5.1.5 Unarmoured single-sheathed cable 9
5.2 Conductors 9
5.3 Insulation 9
5.3.1 Material 9
5.3.2 Application 10
5.3.3 Thickness of insulation 10
5.4 Screening of cores 10
5.4.1 General 10
5.4.2 Conductor screening 10
5.4.3 Insulation screening 10
5.5 Metallic screen 11
5.5.1 Construction 11
5.5.2 Requirements 11
5.6 Assembly of three-core cables, inner coverings and fillers 11
5.7 Inner covering 11
5.7.1 General 11
5.7.2 Thickness of inner covering 11
5.8 Inner sheath 12
5.8.1 Material 12
5.8.2 Application 12
5.8.3 Thickness of inner sheath 12
5.9 Braid armour 12
5.9.1 General 12
5.9.2 Braid wire armour 13
5.9.3 Braid wire diameter 13
5.10 Outer sheath 13
5.10.1 Material 13
5.10.2 Application 13
5.10.3 Thickness of outer sheath 13
5.10.4 Colour of outer sheath 14

6 Tests – Methods and requirements 14
Annex A (normative) Electrical tests after installation 17
Bibliography 18

Table 1 – Insulation thickness 10
Table 2 – Thickness of extruded inner covering for calculation of fictious diameters 12
Table 3 –Tests applicable to all cables 14
Table 4 – Additional tests for halogen-free cables 15
Table 5 – Additional test for low smoke cables 16
Table 6 – Additional tests when required 16

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

ELECTRICAL INSTALLATIONS IN SHIPS –

Part 354: Single- and three-core power cables with extruded solid insulation for rated voltages 6 kV (U_m = 7,2 kV) up to 30 kV (U_m = 36 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.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
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.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60092-354 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.

This fourth edition cancels and replaces the third edition published in 2014. This edition constitutes a technical revision.

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

a) Editorial adaptations have been made.

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

CDV	Report on voting
18A/419/CDV	18A/424/RVC

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

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

The 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 "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

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

ELECTRICAL INSTALLATIONS IN SHIPS –

Part 354: Single- and three-core power cables with extruded solid insulation for rated voltages 6 kV (U_m = 7,2 kV) up to 30 kV (U_m = 36 kV)

1 Scope

This part of IEC 60092 is applicable to shipboard and offshore power cables with extruded solid insulation, conductor and core screening, having a voltage rating of one of the following: 3,6/6 (7,2) kV,6/10 (12) kV, 8,7/15 (17,5) kV, 12/20 (24) kV, 18/30 (36) kV.

NOTE 1 Subclause 4.1 gives more details.

The cables are intended for fixed installations.

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

NOTE 2 Only radial field cables are covered.

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 60038, *IEC standard voltages*

IEC 60228, *Conductors of insulated cables*

IEC 60092-350:—, *Electrical installations in ships – Part 350: General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications*[1]

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

[1] Under preparation. Stage at the time of publication: IEC/BPUB 60092-350:2019.

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 under fire conditions – Part 3-22: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category A*

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 60885-2, *Electrical test methods for electric cables. Part 2: Partial discharge tests*

IEC 61034-1, *Measurement of smoke density of cables burning under defined conditions – Part 1: Test apparatus*

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

SOMMAIRE

AVANT-PROPOS 22
1 Domaine d'application 24
2 Références normatives 24
3 Termes et définitions 25
4 Exigences générales 25
4.1 Tension assignée 25
4.2 Marquages 26
4.2.1 Indication de l'origine et de la tension 26
4.2.2 Continuité du marquage 26
4.2.3 Identification des conducteurs pour les câbles tripolaires 26
5 Exigences de construction 26
5.1 Description générale des câbles 26
5.1.1 Vue d'ensemble 26
5.1.2 Câble armé à une seule gaine, externe uniquement 26
5.1.3 Câble armé à deux gaines, interne et externe 27
5.1.4 Câble armé à une seule gaine, interne uniquement 27
5.1.5 Câble non armé à une seule gaine 27
5.2 Ames 27
5.3 Enveloppe isolante 28
5.3.1 Matériau 28
5.3.2 Application 28
5.3.3 Epaisseur de l'enveloppe isolante 28
5.4 Blindage des conducteurs 28
5.4.1 Généralités 28
5.4.2 Ecran sur âme 29
5.5 Ecran métallique 29
5.5.1 Construction 29
5.5.2 Exigences 29
5.6 Assemblage des câbles tripolaires, revêtements d'assemblage et bourrages 29
5.7 Revêtement d'assemblage 29
5.7.1 Généralités 29
5.7.2 Epaisseur du revêtement d'assemblage 30
5.8 Gaine interne 30
5.8.1 Matériau 30
5.8.2 Application 30
5.8.3 Epaisseur de la gaine interne 30
5.9 Armure tressée 30
5.9.1 Généralités 30
5.9.2 Armure du fil tressé 31
5.9.3 Diamètre du fil tressé 31
5.10 Gaine externe 31
5.10.1 Matériau 31
5.10.2 Application 31
5.10.3 Epaisseur de la gaine externe 31
5.10.4 Couleur de la gaine externe 32
6 Essais – Méthodes et exigences 32

Annexe A (normative) Essais électriques après installation 35
Bibliographie 36

Tableau 1 – Epaisseur de l'enveloppe isolante 28
Tableau 2 – Epaisseur du revêtement d'assemblage extrudé pour le calcul des diamètres fictifs 30
Tableau 3 – Essais applicables à tous les câbles 32
Tableau 4 – Essais supplémentaires pour les câbles sans halogène 34
Tableau 5 – Essai supplémentaire pour les câbles à faibles émissions de fumées 34
Tableau 6 – Essais supplémentaires lorsqu'ils sont exigés 34

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

_____

INSTALLATIONS ÉLECTRIQUES À BORD DES NAVIRES –

Partie 354: Câbles d'énergie unipolaires et tripolaires à isolement massif extrudé pour des tensions assignées allant de 6 kV (U_m = 7,2 kV) jusqu'à 30 kV (U_m = 36 kV)

AVANT-PROPOS

1) La Commission Electrotechnique Internationale (IEC) est une organisation mondiale de normalisation composée de l'ensemble des comités électrotechniques nationaux (Comités nationaux de l'IEC). L'IEC a pour objet de favoriser la coopération internationale pour toutes les questions de normalisation dans les domaines de l'électricité et de l'électronique. A cet effet, l'IEC - entre autres activités - publie des Normes internationales, des Spécifications techniques, des Rapports techniques, des Spécifications accessibles au public (PAS) et des Guides (ci-après dénommés "Publication(s) de l'IEC"). Leur élaboration est confiée à des comités d'études, aux travaux desquels tout Comité national de l'IEC intéressé par le sujet traité peut participer. Les organisations internationales, gouvernementales et non gouvernementales, en liaison avec l'IEC, participent également aux travaux. L'IEC collabore étroitement avec l'Organisation Internationale de Normalisation (ISO), selon des conditions fixées par accord entre les deux organisations.
2) Les décisions ou accords officiels de l'IEC concernant les questions techniques représentent, dans la mesure du possible, un accord international sur les sujets étudiés, étant donné que les Comités nationaux de l'IEC intéressés sont représentés dans chaque comité d'études.
3) Les Publications de l'IEC se présentent sous la forme de recommandations internationales et sont agréées comme telles par les Comités nationaux de l'IEC. Tous les efforts raisonnables sont entrepris afin que l'IEC s'assure de l'exactitude du contenu technique de ses publications; l'IEC ne peut pas être tenue responsable de l'éventuelle mauvaise utilisation ou interprétation qui en est faite par un quelconque utilisateur final.
4) Dans le but d'encourager l'uniformité internationale, les Comités nationaux de l'IEC s'engagent, dans toute la mesure possible, à appliquer de façon transparente les Publications de l'IEC dans leurs publications nationales et régionales. Toutes divergences entre toutes Publications de l'IEC et toutes publications nationales ou régionales correspondantes doivent être indiquées en termes clairs dans ces dernières.
5) L'IEC elle-même ne fournit aucune attestation de conformité. Des organismes de certification indépendants fournissent des services d'évaluation de conformité et, dans certains secteurs, accèdent aux marques de conformité de l'IEC. L'IEC n'est responsable d'aucun des services effectués par les organismes de certification indépendants.
6) Tous les utilisateurs doivent s'assurer qu'ils sont en possession de la dernière édition de cette publication.
7) Aucune responsabilité ne doit être imputée à l'IEC, à ses administrateurs, employés, auxiliaires ou mandataires, y compris ses experts particuliers et les membres de ses comités d'études et des Comités nationaux de l'IEC, pour tout préjudice causé en cas de dommages corporels et matériels, ou de tout autre dommage de quelque nature que ce soit, directe ou indirecte, ou pour supporter les coûts (y compris les frais de justice) et les dépenses découlant de la publication ou de l'utilisation de cette Publication de l'IEC ou de toute autre Publication de l'IEC, ou au crédit qui lui est accordé.
8) L'attention est attirée sur les références normatives citées dans cette publication. L'utilisation de publications référencées est obligatoire pour une application correcte de la présente publication.
9) L'attention est attirée sur le fait que certains des éléments de la présente Publication de l'IEC peuvent faire l'objet de droits de brevet. L'IEC ne saurait être tenue pour responsable de ne pas avoir identifié de tels droits de brevets et de ne pas avoir signalé leur existence.

La Norme internationale IEC 60092-354 a été établie par le sous-comité 18A: Câbles électriques pour navires et unités mobiles et fixes en mer, du comité d'études 18 de l'IEC: Installations électriques des navires et des unités mobiles et fixes en mer.

Cette quatrième édition annule et remplace la troisième édition parue en 2014. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

a) des adaptations rédactionnelles ont été effectuées.

Le texte de cette Norme internationale est issu des documents suivants:

CDV	Rapport de vote
18A/419/CDV	18A/424/RVC

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation du présent document.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2.

Une liste de toutes les parties de la série IEC 60092, publiées sous le titre général *Installations électriques à bord des navires*, peut être consultée sur le site web de l'IEC.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "http://webstore.iec.ch" dans les données relatives au document recherché. A cette date, le document sera

- reconduit,
- supprimé,
- remplacé par une édition révisée, ou
- amendé.

INSTALLATIONS ÉLECTRIQUES À BORD DES NAVIRES –

Partie 354: Câbles d'énergie unipolaires et tripolaires à isolement massif extrudé pour des tensions assignées allant de 6 kV (U_m = 7,2 kV) jusqu'à 30 kV (U_m = 36 kV)

1 Domaine d'application

La présente partie de l'IEC 60092 est applicable aux câbles d'énergie installés à bord des navires et des unités en mer à isolement massif extrudé, avec écran sur âme et blindage des conducteurs, et ayant l'une des tensions assignées suivantes: 3,6/6 (7,2) kV,6/10 (12) kV, 8,7/15 (17,5) kV, 12/20 (24) kV, 18/30 (36) kV.

NOTE 1 Le 4.1 fournit davantage d'informations à ce sujet.

Les câbles sont destinés à des installations fixes.

Les différents types de câbles d'énergie sont présentés en 5.1. Les exigences de fabrication et les méthodes d'essai sont alignées sur celles qui sont indiquées dans l'IEC 60092-350, sauf spécification contraire dans le présent document.

L'objet du présent document est:

– de normaliser les câbles dont la sécurité et la fiabilité sont assurées lorsqu'ils sont installés conformément aux exigences de l'IEC 60092-352 ou de l'IEC 61892-4;
– d'établir des exigences et caractéristiques de fabrication normalisées pour ces câbles se référant directement ou indirectement à la sécurité;
– de spécifier les méthodes d'essai visant à vérifier la conformité à ces exigences.

NOTE 2 Seuls les câbles à champ radial sont couverts.

2 Références normatives

Les documents suivants sont cités dans le texte de sorte qu'ils constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60038, *Tensions normales de la CEI*

IEC 60228, *Ames des câbles isolés*

IEC 60092-350:—, *Electrical installations in ships – Part 350: General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications* (disponible en anglais seulement) [1]

IEC 60092-360, *Installations électriques à bord des navires – Partie 360: Matériaux d'isolation et de gainage des câbles d'alimentation, de commande, d'instrumentation et de télécommunication installés à bord des navires et des unités en mer*

[1] En cours de préparation. Stade au moment de la publication: IEC/BPUB 60092-350:2019.

IEC 60332-1-2, *Essais des câbles électriques et à fibres optiques soumis au feu – Partie 1-2: Essai de propagation verticale de la flamme sur conducteur ou câble isolé – Procédure pour flamme à prémélange de 1 kW*

IEC 60332-3-22, *Essais des câbles électriques soumis au feu – Partie 3-22: Essai de propagation verticale de la flamme des fils ou câbles montés en nappes en position verticale – Catégorie A*

IEC 60684-2, *Gaines isolantes souples – Partie 2: Méthodes d'essai*

IEC 60754-1, *Essai sur les gaz émis lors de la combustion des matériaux des câbles – Partie 1: Détermination de la quantité de gaz acide halogéné*

IEC 60754-2, *Essai sur les gaz émis lors de la combustion des matériaux prélevés sur câbles – Partie 2: Détermination de la conductivité et de l'acidité (par mesure du pH)*

IEC 60885-2, *Méthodes d'essais électriques pour les câbles électriques. Deuxième partie: Essais de décharges partielles*

IEC 61034-1, *Mesure de la densité de fumées dégagées par des câbles brûlant dans des conditions définies – Partie 1: Appareillage d'essai*

IEC 61034-2, *Mesure de la densité de fumées dégagées par des câbles brûlant dans des conditions définies – Partie 2: Procédure d'essai et exigences*