

Norma Italiana

Data Pubblicazione

CEI EN 62485-3

2016-05

La seguente Norma è identica a: EN 62485-3:2014-10.

Titolo

Prescrizioni di sicurezza per batterie di accumulatori e loro installazioni Parte 3: Batterie di trazione

Title

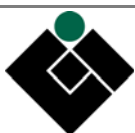
Safety requirements for secondary batteries and battery installations Part 3: Traction batteries

Sommario

La presente Norma sostituisce completamente la Norma CEI EN 50272-3:2003-04 che rimane applicabile fino al 14-08-2017.

Questa Norma viene pubblicata dal CEI nella sola lingua inglese in quanto particolarmente mirata a settori specialistici.

La presente Norma recepisce il testo originale inglese della Pubblicazione IEC.



© CEI COMITATO ELETTROTECNICO ITALIANO - Milano 2016. Riproduzione vietata

Tutti i diritti sono riservati. Nessuna parte del presente Documento può essere riprodotta, messa in rete o diffusa con un mezzo qualsiasi senza il consenso scritto del CEI. Concessione per utente singolo. Le Norme CEI sono revisionate, quando necessario, con la pubblicazione sia di nuove edizioni sia di varianti. È importante pertanto che gli utenti delle stesse si accertino di essere in possesso dell'ultima edizione o variante.

DATI IDENTIFICATIVI CEI

Norma italiana CEI EN 62485-3

Classificazione CEI 21-64

Edizione

COLLEGAMENTI/RELAZIONI TRA DOCUMENTI

Nazionali (SOC) CEI EN 50272-3:2003-04 (CEI 21-42); fasc. 6880, che rimane applicabile fino al 14-08-2017;

Europei (IDT) EN 62485-3:2014-10;

Internazionali (IDT) IEC 62485-3:2014-07;

Legislativi

Legenda (SOC) - La Norma in oggetto sostituisce completamente le Norme indicate dopo il riferimento (SOC)
(IDT) - La Norma in oggetto è identica alle Norme indicate dopo il riferimento (IDT)

INFORMAZIONI EDITORIALI

Pubblicazione Norma Tecnica

Stato Edizione In vigore

Data validità 01-06-2016

Ambito validità Internazionale

Fascicolo 14867 E

Ed. Prec. Fasc. Nessuna

Comitato Tecnico CT 21/35-Accumulatori e pile

Approvata da Presidente del CEI

In data 22-04-2016

CENELEC

In data 14-08-2014

Sottoposta a Inchiesta pubblica come Documento originale

Chiusura in data 13-06-2014

ICS I29.220.20; 29.220.30; 43.040.10;

EUROPEAN STANDARD

EN 62485-3

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2014

ICS 29.220.20; 29.220.30; 43.040.10

Supersedes EN 50272-3:2002

English Version

**Safety requirements for secondary batteries and battery
installations - Part 3: Traction batteries
(IEC 62485-3:2014)**

Exigences de sécurité pour les batteries d'accumulateurs et
les installations de batteries - Partie 3: Batteries de traction
(CEI 62485-3:2014)

Sicherheitsanforderungen an Batterien und Batterieanlagen -
Teil 3: Antriebsbatterien für Elektrofahrzeuge
(IEC 62485-3:2014)

This European Standard was approved by CENELEC on 2014-08-14. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Foreword

The text of document 21/834/FDIS, future edition 2 of IEC 62485-3, prepared by IEC/TC 21 "Secondary cells and batteries" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62485-3:2014.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2015-05-14
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2017-08-14

This document supersedes EN 50272-3:2002.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 62485-3:2014 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated :

IEC 61429

NOTE

Harmonized as EN 61429.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60204-1	-	Safety of machinery - Electrical equipment of machines - Part 1: General requirements	EN 60204-1	-
IEC 60364-4-41 (mod)	2005	Low-voltage electrical installations - Part 4-41: Protection for safety - Protection against electric shock	HD 60364-4-41	2007
-	-		+ corrigendum Jul.	2007
IEC 60900	-	Live working - Hand tools for use up to 1 000 V a.c. and 1 500 V d.c.	EN 60900	-
IEC 61140	-	Protection against electric shock - Common aspects for installation and equipment	EN 61140	-
ISO 3864	series	Graphical symbols - Safety colours and safety signs	-	-



IEC 62485-3

Edition 2.0 2014-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Safety requirements for secondary batteries and battery installations –
Part 3: Traction batteries**

**Exigences de sécurité pour les batteries d'accumulateurs et les installations
de batteries –
Partie 3: Batteries de traction**





THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2014 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

IEC Catalogue - webstore.iec.ch/catalogue

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

IEC publications search - www.iec.ch/searchpub

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing more than 30 000 terms and definitions in English and French, with equivalent terms in 14 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary

More than 55 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Catalogue IEC - webstore.iec.ch/catalogue

Application autonome pour consulter tous les renseignements bibliographiques sur les Normes internationales, Spécifications techniques, Rapports techniques et autres documents de l'IEC. Disponible pour PC, Mac OS, tablettes Android et iPad.

Recherche de publications IEC - www.iec.ch/searchpub

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

Electropedia - www.electropedia.org

Le premier dictionnaire en ligne de termes électroniques et électriques. Il contient plus de 30 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans 14 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary

Plus de 55 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: csc@iec.ch.



IEC 62485-3

Edition 2.0 2014-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Safety requirements for secondary batteries and battery installations –
Part 3: Traction batteries**

**Exigences de sécurité pour les batteries d'accumulateurs et les installations
de batteries –
Partie 3: Batteries de traction**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX

S

ICS 29.220.20; 29.220.30; 43.040.10

ISBN 978-2-8322-1690-3

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD.....	4
1 Scope.....	6
2 Normative references.....	6
3 Terms and definitions.....	6
4 Protection against electric shock by the battery and charger.....	8
4.1 General.....	8
4.2 Protection against both direct and indirect contact.....	9
4.3 Protection against direct and indirect contact when discharging the traction battery on the vehicle (battery disconnected from charger/mains).....	9
4.4 Protection against direct and indirect contact when charging the traction battery.....	10
5 Prevention of short circuits and protection from other effects of electric current.....	10
5.1 Cables and cell connectors.....	10
5.2 Protective measures during maintenance.....	10
5.3 Battery insulation.....	11
6 Provisions against explosion hazards by ventilation.....	11
6.1 Gas generation.....	11
6.2 Ventilation requirements.....	12
6.2.1 General.....	12
6.2.2 Calculation of the minimum ventilation air flow.....	12
6.2.3 Recommended charging practice.....	13
6.2.4 Special chargers.....	14
6.2.5 Multiple charging.....	14
6.3 Natural ventilation.....	14
6.4 Forced ventilation.....	15
6.5 Close vicinity to the battery.....	15
6.6 Ventilation of battery compartment.....	15
7 Provisions against electrolyte hazard.....	15
7.1 Electrolyte and water.....	15
7.2 Protective clothing.....	15
7.3 Accidental contact, "first aid".....	16
7.3.1 General.....	16
7.3.2 Eye contact.....	16
7.3.3 Skin contact.....	16
7.4 Battery accessories and maintenance tools.....	16
8 Battery containers and enclosures.....	16
9 Accommodation for charging/maintenance.....	16
10 Battery peripheral equipment/accessories.....	17
10.1 Battery monitoring system.....	17
10.2 Central water filling system.....	18
10.2.1 General.....	18
10.2.2 Safety aspects.....	18
10.3 Central degassing systems.....	18
10.4 Thermal management systems.....	19
10.5 Electrolyte agitation system.....	19
10.6 Catalyst vent plugs.....	19

10.7	Connectors (plugs/sockets)	19
11	Identification labels, warning notices and instructions for use, installation and maintenance	19
11.1	Warning labels	19
11.2	Identification label	20
11.3	Instructions	20
11.4	Other labels	20
12	Transportation, storage, disposal and environmental aspects	20
12.1	Packing and transport	20
12.2	Disassembly, disposal, and recycling of batteries.....	21
13	Inspection and monitoring	21
	Bibliography	22
Table 1 – Guideline: Maximum final charging current in A per 100 Ah during normal conditions of use		14

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**SAFETY REQUIREMENTS FOR SECONDARY BATTERIES
AND BATTERY INSTALLATIONS –****Part 3: Traction batteries**

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 62485-3 has been prepared by IEC technical committee 21: Secondary cells and batteries.

This second edition cancels and replaces the first edition published in 2010. This edition constitutes a technical revision.

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

- a) a comprehensive revision of Clause 6, presenting a unified and changed formula for the calculation of the required ventilation air flow during battery charging;
- b) addition of requirements for properties of floor material and battery changing equipment in Clause 9.

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

FDIS	Report on voting
21/834/FDIS	21/843/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.

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

A list of all parts of the IEC 62485 series can be found, under the general title *Safety requirements for secondary batteries and battery installations*, on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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

SAFETY REQUIREMENTS FOR SECONDARY BATTERIES AND BATTERY INSTALLATIONS –

Part 3: Traction batteries

1 Scope

This part of the IEC 62485 applies to secondary batteries and battery installations used for electric vehicles, e.g. in electric industrial trucks (including lift trucks, tow trucks, cleaning machines, automatic guided vehicles), in battery powered locomotives, in electric vehicles (e.g. goods vehicles, golf carts, bicycles, wheelchairs), and does not cover the design of such vehicles.

This International Standard covers lead dioxide-lead (lead-acid), nickel oxide-cadmium, nickel-oxide-metal hydride and other alkaline secondary batteries. Safety aspects of secondary lithium batteries in such applications will be covered in their own appropriate standards.

The nominal voltages are limited to 1 000 V a.c. and 1 500 V d.c. respectively and the principal measures for protection against hazards generally from electricity, gas emission and electrolyte are described.

It provides requirements on safety aspects associated with the installation, use, inspection, maintenance and disposal of batteries.