

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Primary batteries –
Part 2: Physical and electrical specifications**

**Piles électriques –
Partie 2: Spécifications physiques et électriques**



THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2015 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 It also gives information on projects, replaced and withdrawn publications.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 15 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary

More than 60 000 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 15 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary

Plus de 60 000 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.

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Primary batteries –
Part 2: Physical and electrical specifications**

**Piles électriques –
Partie 2: Spécifications physiques et électriques**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 29.220.10

ISBN 978-2-8322-2974-3

**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.....	5
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references	8
3 Terms, definitions, symbols and abbreviations.....	8
3.1 Terms and definitions.....	8
3.2 Symbols and abbreviations	9
4 Battery dimensions, symbols	10
5 Constitution of the battery specification tables.....	10
6 Physical and electrical specifications.....	12
6.1 Category 1 batteries	12
6.1.1 General	12
6.1.2 Category 1 – Specifications: LR20, R20P, R20S.....	13
6.1.3 Category 1 – Specifications: LR14, R14P, R14S.....	14
6.1.4 Category 1 – Specifications: LR6, FR14505, R6P, R6S.....	15
6.1.5 Category 1 – Specifications: LR03, FR10G445, R03.....	16
6.1.6 Category 1 – Specifications: LR1, R1, LR8D425.....	17
6.2 Category 2 batteries – Specifications: CR14250, CR15H270, CR17345, CR17450, BR17335.....	18
6.3 Category 3 batteries – Specifications: LR9, CR11108.....	19
6.4 Category 4 batteries.....	20
6.4.1 General.....	20
6.4.2 Category 4 – Specifications: PR70, PR41, PR48, PR44.....	20
6.4.3 Fit acceptance gauge for PR batteries.....	22
6.4.4 Category 4 – Specifications: LR41, LR55, LR54, LR43, LR44.....	23
6.4.5 Category 4 – Specifications: SR62, SR63, SR65, SR64, SR60, SR67, SR66, SR58, SR68, SR59, SR69, SR41, SR57, SR55, SR48, SR54, SR42, SR43, SR44.....	25
6.4.6 Category 4 – Specifications: CR1025, CR1216, CR1220, CR1616, CR2012, CR1620, CR2016, CR2025, CR2320, CR2032, CR2330, CR2430, CR2354, CR3032, CR2450, BR1225, BR2016, BR2320, BR2325, BR3032.....	27
6.5 Category 5 batteries	29
6.5.1 Category 5 – Specifications: 4LR44, 2CR13252, 4SR44.....	29
6.5.2 Category 5 – Specifications: 5AR40.....	30
6.6 Category 6 batteries	31
6.6.1 Category 6 – Specifications: 3R12P, 3R12S, 3LR12.....	31
6.6.2 Category 6 – Specifications: 4LR61.....	32
6.6.3 Category 6 – Specifications: CR-P2.....	33
6.6.4 Category 6 – Specifications: 2CR5.....	34
6.6.5 Category 6 – Specifications: 4R25X, 4LR25X.....	35
6.6.6 Category 6 – Specifications: 4R25Y.....	36
6.6.7 Category 6 – Specifications: 4R25-2, 4LR25-2.....	37
6.6.8 Category 6 – Specifications: 6F22, 6LR61, 6LP3146.....	38
6.6.9 Category 6 – Configurations: Stud for 6F22, 6LR61 6LP3146.....	39
6.6.10 Category 6 – Specifications: 6AS4.....	40
6.6.11 Category 6 – Specifications: 6AS6.....	41

Annex A (informative) Tabulation of batteries by application	42
Annex B (informative) Cross-reference index	48
Annex C (informative) Index.....	51
Annex D (informative) Common designation.....	52
Bibliography.....	53
Figure 1 – Dimensional drawing: Category 1	12
Figure 2 – Dimensional drawing: LR20, R20P, R20S.....	13
Figure 3 – Dimensional drawing: LR14, R14P, R14S.....	14
Figure 4 – Dimensional drawing: LR6, FR14505, R6P, R6S	15
Figure 5 – Dimensional drawing: LR03, FR10G445, R03.....	16
Figure 6 – Dimensional drawing: LR1, R1, LR8D425.....	17
Figure 7 – Dimensional drawing: CR14250, CR15H270, CR17345, CR17450, BR17335	18
Figure 8 – Dimensional drawing: LR9, CR11108	19
Figure 9 – Dimensional drawing: Category 4	20
Figure 10 – Dimensional drawing: PR70, PR41, PR48, PR44.....	20
Figure 11 – Gauge opening for P system batteries.....	22
Figure 12 – Suggested gauge layout.....	22
Figure 13 – Air hole placement diagram for P system batteries	23
Figure 14 – Dimensional drawing: LR41, LR55, LR54, LR43, LR44	23
Figure 15 – Dimensional drawing: SR62, SR63, SR65, SR64, SR60, SR67, SR66, SR58, SR68, SR59, SR69, SR41, SR57, SR55, SR48, SR54, SR42, SR43, SR44	25
Figure 16 – Dimensional drawing: CR1025, CR1216, CR1220, CR1616, CR2012, CR1620, CR2016, CR2025, CR2320, CR2032, CR2330, CR2430, CR2354, CR3032, CR2450, BR1225, BR2016, BR2320, BR2325, BR3032	27
Figure 17 – Dimensional drawing: 4LR44, 2CR13252, 4SR44	29
Figure 18 – Dimensional drawing: 5AR40.....	30
Figure 19 – Dimensional drawing: 3R12P, 3R12S, 3LR12	31
Figure 20 – Dimensional drawing: 4LR61	32
Figure 21 – Dimensional drawing: CR-P2.....	33
Figure 22 – Dimensional drawing: 2CR5	34
Figure 23 – Dimensional drawing: 4R25X, 4LR25X	35
Figure 24 – Dimensional drawing: 4R25Y.....	36
Figure 25 – Dimensional drawing: 4R25-2, 4LR25-2	37
Figure 26 – Dimensional drawing: 6F22, 6LR61, 6LP3146	38
Figure 27 – Dimensional drawing: Stud	39
Figure 28 – Dimensional drawing: 6AS4.....	40
Figure 29 – Dimensional drawing: 6AS6.....	41
Table 1 – Gauge opening dimension (mm).....	22
Table A.1 – Automatic camera	42
Table A.2 – CD, digital audio, wireless gaming and accessories	42
Table A.3 – Digital audio.....	42
Table A.4 – Digital still camera	42

Table A.5 – Electric equipment	42
Table A.6 – Electric fence controller	43
Table A.7 – Electronic key	43
Table A.8 – Hearing aid	43
Table A.9 – Hearing aid high drain	43
Table A.10 – Hearing aid standard	43
Table A.11 – High intensity lighting	43
Table A.12 – Laser pointer	44
Table A.13 – Pager	44
Table A.14 – Photo	44
Table A.15 – Portable lighting (LED)	44
Table A.16 – Portable stereo	45
Table A.17 – Radio	45
Table A.18 – Radio / Clock	45
Table A.19 – Radio / Clock / Remote control	45
Table A.20 – Remote control	45
Table A.21 – Road warning lamp	46
Table A.22 – Smoke detector	46
Table A.23 – Toy (motor)	46
Table A.24 – Toy (non-motorized)	46
Table A.25 – Wireless streaming	47
Table B.1 – Category 1 batteries	48
Table B.2 – Category 2 batteries	48
Table B.3 – Category 3 batteries	48
Table B.4 – Category 4 batteries	49
Table B.5 – Category 5 batteries	50
Table B.6 – Category 6 batteries	50
Table C.1 – Index	51
Table D.1 – Index	52

INTERNATIONAL ELECTROTECHNICAL COMMISSION

PRIMARY BATTERIES –

Part 2: Physical and electrical specifications

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 60086-2 has been prepared by IEC technical committee 35: Primary cells and batteries.

This thirteenth edition cancels and replaces the twelfth edition (2011) and constitutes a technical revision.

Significant changes from the previous edition are test changes to battery types R03, LR03, R6, LR6, PR70, PR41, PR48, 6F22, 6LR61, 6LP3146 4LR25-2, R14, LR14, R20, LR20, CR2025, and CR2032, adding the 5AR40 back into the standard, addition of common designations, addition of two new battery types FR14505 and FR10G445, deletion of battery types LR53, R40, 2EP3863, 6F100, and general editorial changes.

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

FDIS	Report on voting
35/1350/FDIS	35/1352/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 in the IEC 60086 series, under the general title *Primary batteries*, can be found 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 website 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.

Withdrawn

INTRODUCTION

The technical content of this part of IEC 60086 provides physical dimensions, discharge test conditions and discharge performance requirements. IEC 60086-2 complements the general information and requirements of IEC 60086-1.

This part was prepared to benefit primary battery users, device designers and battery manufacturers by furnishing the specifics of form, fit and function for individual standardized primary cells and batteries. Over the years, this part has been changed to improve its contents and may again be revised in due course in the light of comments made by national committees and experts on the basis of practical experience and changing technology.

This current revision is the result of a reformatting initiative, as well as some content changes, aimed at making this part more user-friendly, less ambiguous, and, from a cross reference basis, fully harmonized with other parts of IEC 60086.

NOTE Safety information is available in IEC 60086-4, IEC 60086-5 and IEC 62281.

Withdrawal