

# INTERNATIONAL STANDARD



**Lead-acid starter batteries –  
Part 2: Dimensions of batteries and dimensions and marking of terminals**



## THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2021 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.

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

Tel.: +41 22 919 02 11  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://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 corrigendum or an amendment might have been published.

#### IEC publications search - [webstore.iec.ch/advsearchform](http://webstore.iec.ch/advsearchform)

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 It also gives information on projects, replaced and withdrawn publications.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](http://webstore.iec.ch/justpublished)

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

#### IEC Customer Service Centre - [webstore.iec.ch/csc](http://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: [sales@iec.ch](mailto:sales@iec.ch).

#### IEC online collection - [oc.iec.ch](http://oc.iec.ch)

Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

#### Electropedia - [www.electropedia.org](http://www.electropedia.org)

The world's leading online dictionary on electrotechnology, containing more than 22 000 terminological entries in English and French, with equivalent terms in 18 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

Preview generated by EVS

# INTERNATIONAL STANDARD



## Lead-acid starter batteries – Part 2: Dimensions of batteries and dimensions and marking of terminals

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

ICS 29.220.20; 43.040.10

ISBN 978-2-8323-0000-8

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

## CONTENTS

FOREWORD.....	5
1 Scope.....	7
2 Normative references .....	7
3 Terms and definitions .....	7
4 General requirements .....	8
4.1 General.....	8
4.2 Marking.....	8
4.2.1 Safety labelling.....	8
4.2.2 Marking of the polarity of terminals .....	8
4.3 Recycling .....	9
4.3.1 Recycling of lead .....	9
4.3.2 Recycling of plastic material .....	9
4.4 Dimensions and design .....	9
4.5 Dimensions of tapered battery terminals .....	9
5 Recommended types used in Europe (EU).....	10
5.1 General.....	10
5.2 Main dimensions of batteries.....	10
5.3 Handles .....	14
5.3.1 General .....	14
5.3.2 Mounting of handles .....	14
5.4 Mounting of batteries .....	15
5.4.1 General .....	15
5.4.2 Dimensions and arrangement of ledges and notches .....	15
5.5 Terminals.....	16
5.5.1 Position of terminals .....	16
5.5.2 Dimensions of battery terminals.....	16
5.5.3 Marking of polarity .....	16
5.6 Special features of the battery lid.....	17
5.6.1 General .....	17
5.6.2 Semi bloc lid.....	17
5.6.3 Central degassing.....	17
5.6.4 Recessed holes .....	17
5.6.5 Removable cell plugs.....	18
5.6.6 Position of sensor openings.....	18
5.7 Handling of starter batteries by robot-equipment.....	19
5.8 Bulging and reinforcement of battery side walls .....	21
6 Other battery types used in Europe (EU) .....	22
6.1 General.....	22
6.2 Main dimensions of batteries.....	23
6.3 Handles .....	28
6.4 Mounting of batteries .....	28
6.4.1 General .....	28
6.4.2 Dimensions and arrangement of ledges and notches .....	28
6.5 Terminals.....	28
6.5.1 Position of terminals .....	28
6.5.2 Dimensions of battery terminals.....	28

6.5.3	Marking of polarity .....	28
6.6	Handling of starter batteries by robot-equipment .....	28
7	Recommended types used in North America (AM) .....	31
7.1	General.....	31
7.2	Terminals and terminal configuration .....	31
7.2.1	Tapered terminals.....	31
7.2.2	Side terminals.....	31
7.2.3	Terminal configuration .....	32
7.3	Standard fastening on the bottom .....	32
7.3.1	General .....	32
7.3.2	Design of ledges.....	32
7.3.3	Design of recesses .....	33
7.4	Main dimensions of the battery group sizes AM.....	37
8	Recommended types used in East Asia (AS) .....	42
8.1	General.....	42
8.2	Terminals and terminal configuration .....	42
8.2.1	Design of terminals.....	42
8.2.2	Dimensions and classification of terminals.....	42
8.2.3	Configuration of terminals.....	42
8.3	Main dimensions of the battery group sizes AS .....	42
Figure 1	– Marking of polarity .....	8
Figure 2	– Marking of polypropylene-polyethylene copolymer battery components .....	9
Figure 3	– Dimensions of positive (on the right) and negative (on the left) terminal .....	10
Figure 4	– Main dimensions of batteries of standard series LN and LBN – Top view .....	11
Figure 5	– Details of Figure 4.....	12
Figure 6	– Main dimensions of batteries of standard series LN – Front view .....	13
Figure 7	– Main dimensions of batteries of standard series LN – Side view.....	14
Figure 8	– Details of ledges of Figure 6 and Figure 7 .....	16
Figure 9	– Detail X – Notch on ledge.....	16
Figure 10	– Degassing outlet .....	17
Figure 11	– Recessed holes "M" for optional terminal protection .....	18
Figure 12	– Removable cell plugs and sensor positions .....	19
Figure 13	– Grips for handling by robot equipment.....	20
Figure 14	– Section P-P of Figure 13 and Figure 22.....	20
Figure 15	– Detail U of Figure 13 and Figure 22.....	21
Figure 16	– Maximum allowed bulging on short sides.....	21
Figure 17	– Reinforcement by thicker walls on short sides .....	22
Figure 18	– Reinforcement by additional ribs on short sides.....	22
Figure 19	– Main dimensions of batteries of series L, LB, E, EB .....	26
Figure 20	– Main dimensions of batteries of series LS, LBS, ES, EBS .....	27
Figure 21	– Details of Figure 19 and Figure 20 .....	27
Figure 22	– Grips for handling by robot equipment for LBN series.....	29
Figure 23	– Grips for handling by robot equipment for L and LS series .....	29
Figure 24	– Detail V of Figure 23 .....	30

Figure 25 – Grips for handling by robot equipment for LB and LBS series – Option 1 .....	30
Figure 26 – Grips for handling by robot equipment for LB and LBS series – Option 2 .....	30
Figure 27 – Detail Y of Figure 25 and Figure 26 .....	31
Figure 28 – Side terminal groove description .....	32
Figure 29 – Side terminal groove dimensions in mm and (in) .....	32
Figure 30 – Design for batteries with ledges on long sides for hold-down-devices in mm and (in) .....	33
Figure 31 – Design for batteries with recesses on long sides for hold-down-devices in mm and (in) .....	34
Figure 32 – Design for batteries with recesses on sides for hold-down-devices in mm and (in) .....	35
Figure 33 – Design for batteries with recesses on sides for hold-down-devices in mm and (in) .....	36
Figure 34 – Design for batteries with recesses on sides for hold-down-devices in mm and (in) .....	37
Figure 35 – Main dimensions of batteries of group sizes 24R, 26R, 34R, 35, 51R, 85 .....	39
Figure 36 – Main dimensions of batteries of group size 24, 25, 26, 27, 34, 51, 86 .....	39
Figure 37 – Main dimensions of batteries of group size 36R .....	40
Figure 38 – Main dimensions of batteries of group sizes 59, 65 .....	40
Figure 39 – Main dimensions of batteries of group size 75, 78, 100 with positive terminal on the right .....	41
Figure 40 – Main dimensions of batteries of group size 75, 78, 100 with positive terminal on the left .....	41
Figure 41 – Main dimensions of battery group sizes AS .....	43
Table 1 – Main dimensions of batteries of standard series LN .....	11
Table 2 – Main dimensions of batteries of other series LBN .....	23
Table 3 – Main dimensions of other series L, LS, LB and LBS .....	24
Table 4 – Main dimensions of other series E, ES, EB and EBS .....	25
Table 5 – Battery group sizes AM .....	38
Table 6 – Dimensions and classification of terminals .....	42
Table 7 – Dimensions of group sizes AS .....	43

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**LEAD-ACID STARTER BATTERIES –****Part 2: Dimensions of batteries and  
dimensions and marking of terminals****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 60095-2 has been prepared by IEC technical committee 21: Secondary cells and batteries.

This fifth edition cancels and replaces the fourth edition published in 2009. This edition constitutes a technical revision.

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

- a) update of the dimensions of batteries:
  - in Europe according to the last version of the European standard;
  - in USA with figures updated;
  - in Asia with one type of Japanese battery removed.

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

FDIS	Report on voting
21/1086/FDIS	21/1092/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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

A list of all parts in the IEC 60095 series, published under the general title *Lead-acid starter batteries*, 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](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.**



## LEAD-ACID STARTER BATTERIES –

### Part 2: Dimensions of batteries and dimensions and marking of terminals

#### 1 Scope

This part of IEC 60095 is applicable to lead-acid batteries used for starting, lighting and ignition of passenger cars and light vehicles with a nominal voltage of 12 V.

All batteries in accordance with this document can be fastened to the vehicle either by means of the ledges around the container or by means of a hold-down device engaging with the lid.

This document specifies dimensions of battery for Europe, East Asia and North America.

#### 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 60050-482, *International Electrotechnical Vocabulary – Part 482: Primary and secondary cells and batteries*

IEC 60095-1:2018, *Lead-acid starter batteries – Part 1: General requirements and methods of test*

IEC 60417:2002, *Graphical symbols for use on equipment*

ISO/IEC 10646, *Information technology – Universal coded character set (UCS)*

ISO 1043-1, *Plastics – Symbols and abbreviated terms – Part 1: Basic polymers and their special characteristics*

ISO 11469, *Plastics – Generic identification and marking of plastics products*

#### 3 Terms and definitions

For the purpose of this document, the terms and definitions given in IEC 60050-482 apply.

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

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