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INTERNATIONAL STANDARD

colour inside

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

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FOREWORD

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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. The main document types developed by IEC are described in greater detail at 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 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- withdrawn,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

4 General requirements

4.1 General

The specifications of Clause 4 are common to all starter batteries according to this document.

4.2 Marking

4.2.1 Safety labelling

The batteries shall bear the six coloured safety symbols in accordance with 6.1.6 of IEC 60095-1:2018.

4.2.2 Marking of the polarity of terminals

4.2.2.1 General

The batteries shall carry the marking of polarity, at least of the positive terminal.

4.2.2.2 Marking of positive terminals

This marking shall take the form of the symbol "+" either on the upper surface of the positive terminal or on the lid adjacent to the positive terminal.

4.2.2.3 Marking of negative terminals

This marking shall take the form of the symbol "–" either on the upper surface of the negative terminal or on the lid adjacent to the negative terminal.

4.2.2.4 Design and dimensions of marking of terminals

The symbols used for marking the terminals shall be in accordance with IEC 60417-5005:2012-10 for the positive and IEC 60417-5006:2012-10 for the negative polarity.

The dimensions of the marking shall be according to Figure 1.

Dimensions in millimetres

Figure 1 – Marking of polarity

The polarity symbols may be either indented or embossed by (0,4 ± 0,1) mm.

As an alternative, the wordings "POS" and "NEG" are permitted for the North American market only.

4.3 Recycling

4.3.1 Recycling of lead

The batteries shall be marked with the symbols for recycling and separate collection according to IEC 60095-1.

4.3.2 Recycling of plastic material

Injection moulded battery components need to be marked according to ISO 11469 and ISO 1043-1. The marking shall be placed on the bottom of the battery container or on one short side near the ledge.

According to ISO 11469 and ISO 1043-1 the minimum marking for polypropylene-polyethylene copolymer is >PP< or >PP/PE<.

In addition it is possible to show the recycling symbol with number 7 (Unicode character 'RECYCLING SYMBOL FOR TYPE-7 PLASTICS' (U+2679) according to ISO/IEC 10646) and the term "Other".

The recommended thickness is (0,3 ± 0,1) mm. The height of the marking characters shall be between 3 mm and 7 mm.

An example for this marking is shown in Figure 2.

Figure 2 – Marking of polypropylene-polyethylene copolymer battery components

4.4 Dimensions and design

All dimensions given in this document correspond to a temperature of 20 °C of the polypropylene-polyethylene copolymer.

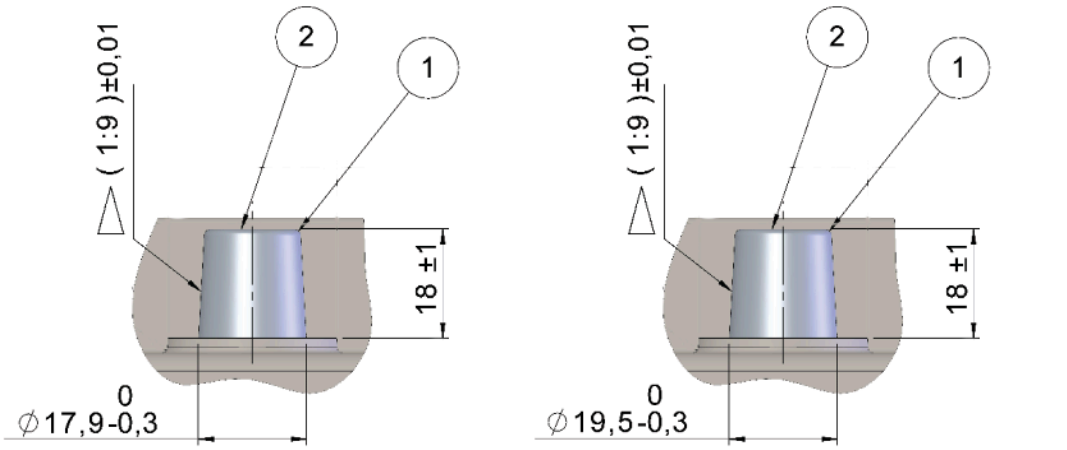
Details of the design that are not indicated in the generic drawings need to be chosen appropriately.

The generic drawings in this document are possible examples only. Especially the design of the lid, handles, ribs, ledges and vent caps are not mandatory in total.

4.5 Dimensions of tapered battery terminals

The dimensions of the tapered positive and negative terminal shall be according to Figure 3.

Dimensions in millimetres



Key

1 Edge with radius

2 Convex or concave surface design permitted within height dimensions of (18 $^{+1}_{-2}$) mm related to the center of the terminal

Figure 3 – Dimensions of positive (on the right) and negative (on the left) terminal

5 Recommended types used in Europe (EU)

5.1 General

For new battery developments, only the recommended series shall be used.

Clause 5 specifies:

– the main dimensions of starter batteries of the preferred LN series;
– the location of the positive and negative terminals with respect to the fastening system;
– the dimensions of tapered terminals of starter batteries.

5.2 Main dimensions of batteries

The main dimensions of the batteries of the LN series are shown in Table 1 and Figure 4, Figure 5, Figure 6 and Figure 7.

NOTE The schematic drawings do not show every design detail of the battery.

The following symbols are used:

a_1 Overall length at the battery base with ledges

a_2 Length at the battery base without ledges

a_3 Length at battery lid

a_4 Distance of the inside notches

a_5 Distance between terminal and the edges of the lid at the short side (see Figure 4 and Figure 6)

a_6 Distance of the grip-segments for handling by robot equipment (see Figure 14)

A Position of optional sensors (see Figure 13)

B Position of optional sensors (see Figure 13)

H Overall height including lid and plugs

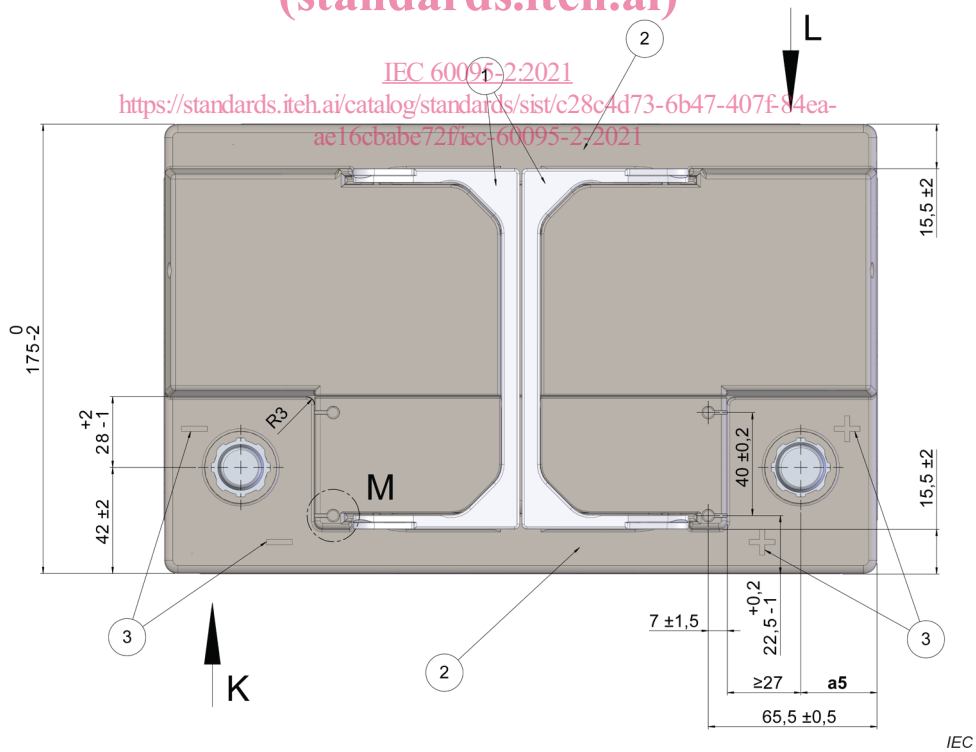
h Height of the top clamping area supporting the hold-down device

Table 1 – Main dimensions of batteries of standard series LN

Dimensions in millimetres

Type	a_1	a_2	a_3	a_4	a_5	a_6	*A*	*B*	*H*	*h*
	+0 / −2	± 1	+0 / −3	+0 / −1	± 2	± 2	± 2	± 2	+0 / −3	+0 / −4
LN 0	175	161	175	40	19	79	13	40		
LN 1	207	193	207	40	24	95	18	48		
LN 2	242	228	242	40	26	113	19	57		
LN 3	278	264	277	40	29	130	27	65	190	168
LN 4	315	301	314	40	31	150	27	74		
LN 5	353	339	352	60	27	168	28	84		
LN 6	394	379	393	60	30	187	31	94		

Dimensions in millimetres



Key

1 Handles shown as example only

2 Top clamping area for fastening

3 Polarity markings

Figure 4 – Main dimensions of batteries of standard series LN and LBN – Top view