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INTERNATIONAL STANDARD

NORME INTERNATIONALE

12 V lithium-ion secondary batteries for automotive starting, lighting, ignition (SLI) applications and auxiliary purposes – Part 1: General requirements and methods of test

Accumulateur ion-lithium 12 V pour les applications de démarrage, d'éclairage, d'allumage (SLI) et les utilisations auxiliaires des véhicules automobiles – Partie 1 : Exigences et méthodes d'essai générales



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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12 V LITHIUM-ION SECONDARY BATTERIES FOR AUTOMOTIVE STARTING, LIGHTING, IGNITION (SLI) APPLICATIONS AND AUXILIARY PURPOSES –

Part 1: General requirements and methods of test

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IEC 63118-1 has been prepared by IEC technical committee 21: Secondary cells and batteries. It is an International Standard.

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

Draft	Report on voting
21/1177/FDIS	21/1185/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/publications.

A list of all parts in the IEC 63118 series, published under the general title *12 V lithium-ion secondary batteries for automotive starting, lighting, ignition (SLI) applications and auxiliary purposes*, 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- withdrawn, or
- revised.

12 V LITHIUM-ION SECONDARY BATTERIES FOR AUTOMOTIVE STARTING, LIGHTING, IGNITION (SLI) APPLICATIONS AND AUXILIARY PURPOSES –

Part 1: General requirements and methods of test

1 Scope

This part of IEC 63118 specifies the general tests and requirements for the performance of lithium secondary batteries with a nominal voltage of 12 V permanently installed in road vehicles not for propulsion. The replacement of secondary batteries permanently installed in road vehicles not for propulsion is covered by this document.

The following are typical applications that utilize the batteries under the scope of this document: power source for the starting of internal combustion engines, lighting, stop and start function, on-board auxiliary equipment and energy absorption for regeneration from braking.

The batteries primarily used for propulsion of electric vehicles (EV) including battery electric vehicles (BEV), hybrid electric vehicles (HEV), and plug-in hybrid electric vehicles (PHEV) are not covered by this document.

This document includes:

- electrical characteristics tests methods and requirements;
- a life duration tests method.

This document does not include:

- dimensions;
- the system communication protocol;
- safety aspects.

NOTE The safety aspects of the batteries are covered by IEC 63057.

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 (IEV) – Part 482: Primary and secondary cells and batteries,* available at http://www.electropedia.org

IEC 62902, *Secondary cells and batteries – Marking symbols for identification of their chemistry*

ISO/IEC Guide 51, *Safety aspects – Guidelines for their inclusion in standards*

3 Terms, definitions and symbols

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-482 and ISO/IEC Guide 51, and the following apply.

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

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

3.1.1
battery
unit comprising one or more cells, modules and a battery management system

3.1.2
battery management system
BMS
set of protection functions associated with a battery to prevent overcharge, overcurrent, over temperature, under temperature and if applicable overdischarge

Note 1 to entry: The function of the BMS can be assigned to the battery or to the vehicle that uses the battery. See IEC 63057:2020, Figure 1.

Note 2 to entry: The BMS can be divided, and it can be found partially in the battery and partially on the equipment that uses the battery. See IEC 63057:2020, Figure 1.

Note 3 to entry: The BMS is sometimes also referred to as a battery management unit (BMU).

Note 4 to entry: The electrical tests specified in Clause 6 can be verified without a BMS by setting the upper and lower limit range set by the manufacturer.

3.1.3
cell
secondary cell
basic functional unit where the electrical energy is derived from the insertion or extraction reactions of lithium ions or the oxidation-reduction reaction of lithium between the negative electrode and the positive electrode

Note 1 to entry: The cell typically has an electrolyte that consists of a lithium salt and organic solvent compound in liquid, gel or solid form and has a metal or a laminate film casing. It is not ready for use in an application because it is not yet fitted with its final housing, terminal arrangement and electronic control device.

3.1.4
final voltage
specified closed circuit voltage at which the discharge of a battery is terminated

Note 1 to entry: The final voltage should be declared by the battery manufacturer.

3.1.5
module
group of cells connected together in a series or parallel configuration, or both, with or without protective device (e.g. fuse or positive temperature coefficient device) and monitoring circuitry

3.1.6
nominal charge current
charge current used to designate or identify the charge performance of a battery

Note 1 to entry: The nominal charge current is declared by the battery manufacturer.

3.1.7
nominal cranking current
discharge current used to designate or identify the cranking performance of a battery

Note 1 to entry: The nominal cranking current is declared by the battery manufacturer.

Note 2 to entry: The nominal cranking current shall not exceed the operating range specified by the battery manufacturer.

3.1.8
nominal voltage
suitable approximate value of the voltage used to designate or identify a battery

Note 1 to entry: The scope of this document is applicable to a battery with a nominal voltage of 12 V.

3.1.9
rated capacity
capacity value of a battery determined under specified conditions and declared by the battery manufacturer

Note 1 to entry: The rated capacity is the quantity of electricity declared by the battery manufacturer which a battery can deliver during an n h period when charging, storing and discharging under the conditions specified in 6.3.

3.2 Symbols

The following symbols are used to denote various numerical values associated with the corresponding quantities:

I_{ca} numerical value of the charge current, expressed in amperes (A);

I_{cc} numerical value of the cranking current, expressed in amperes (A);

C_n numerical value of the rated capacity, expressed in ampere-hours (Ah).

4 Parameter measurement tolerances

The overall accuracy of controlled or measured values, relative to the specified or actual values, shall be within the following tolerances:

a) ±0,5 % for voltage;

b) ±1 % for current;

c) ±5 °C for temperature;

d) ±0,1 % for time.

These tolerances comprise the combined accuracy of the measuring instruments, the measurement techniques used, and all other sources of error in the test procedure.

The details of the instrumentation used shall be provided in any report of results.

5 Marking and designation

Each battery that is installed or maintained shall carry clear and durable markings giving the following information. Details are defined by national regulations:

- "secondary (rechargeable) Li" or "Li-ion";
- polarity;
- name or identification of battery manufacturer or battery supplier;
- rated capacity in 1 h;