SLOVENSKI STANDARD
SIST EN 61427-2:2016

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Sekundarni členi in baterije za shranjevanje obnovljive energije - Splošne zahteve in preskusne metode - 2. del: Omrežne izvedbe

Secondary cells and batteries for renewable energy storage - General requirements and methods of test - Part 2: on-grid applications

Accumulateurs pour le stockage de l'énergie renouvelable - Exigences générales et méthodes d'essais - Partie 2: Applications en réseaux

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English Version

Secondary cells and batteries for renewable energy storage - General requirements and methods of test - Part 2: On-grid applications (IEC 61427-2:2015)

Accumulateurs pour le stockage de l'énergie renouvelable - Exigences générales et méthodes d'essais - Partie 2: Applications en réseaux (IEC 61427-2:2015)

Wiederaufladbare Zellen und Batterien für die Speicherung erneuerbarer Energien - Allgemeine Anforderungen und Prüfverfahren - Teil 2: Netzgekoppelte Anwendungen (IEC 61427-2:2015)

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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

European foreword

The text of document 21/862/FDIS, future edition 1 of IEC 61427-2, prepared by IEC/TC 21 "Secondary cells and batteries" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61427-2:2015.

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) 2016-07-02
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2018-10-02

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60623	NOTE	Harmonized as EN 60623.
IEC 60730-1	NOTE	Harmonized as EN 60730-1.
IEC 60812	NOTE	Harmonized as EN 60812.
IEC 60896-11	NOTE	Harmonized as EN 60896-11.
IEC 60896-21	NOTE	Harmonized as EN 60896-21.
IEC 60896-22	NOTE	Harmonized as EN 60896-22.
IEC 61025	NOTE	Harmonized as EN 61025.
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Secondary cells and batteries for renewable energy storage – General requirements and methods of test – Part 2: On-grid applications

Accumulateurs pour le stockage de l'énergie renouvelable – Exigences générales et méthodes d'essais – Partie 2: Applications en réseau

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SECONDARY CELLS AND BATTERIES FOR RENEWABLE ENERGY STORAGE – GENERAL REQUIREMENTS AND METHODS OF TEST –

Part 2: On-grid applications

FOREWORD

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International Standard IEC 61427-2 has been prepared by IEC technical committee 21: Secondary cells and batteries.

A list of all parts in the IEC 61427 series, published under the general title *Secondary cells and batteries for renewable energy storage – General requirements and methods of test*, can be found on the IEC website.

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

FDIS	Report on voting
21/862/FDIS	21/863/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.

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.

SECONDARY CELLS AND BATTERIES FOR RENEWABLE ENERGY STORAGE – GENERAL REQUIREMENTS AND METHODS OF TEST

Part 2: On-grid applications

1 Scope

This part of IEC 61427 relates to secondary batteries used in on-grid Electrical Energy Storage (EES) applications and provides the associated methods of test for the verification of their endurance, properties and electrical performance in such applications. The test methods are essentially battery chemistry neutral, i.e. applicable to all secondary battery types.

On-grid applications are characterized by the fact that batteries are connected, via power conversion devices, to a regional or nation- or continent-wide electricity grid and act as instantaneous energy sources and sinks to stabilize the grid's performance when randomly major amounts of electrical energy from renewable energy sources are fed into it.

Related power conversion and interface equipment is not covered by this part of IEC 61427.

2 Normative references

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.

None.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
accuracy
<of a measuring instrument>

quality which characterizes the ability of a measuring instrument to provide an indicated value close to a true value of the quantity to be measured

Note 1 to entry: This term is used in the "true" value approach.

Note 2 to entry: Accuracy is better when the indicated value is closer to the corresponding true value.

[SOURCE: IEC 60050-311:2001, 311-06-08]

3.2
accuracy class
category of measuring instruments, all of which are intended to comply with a set of specifications regarding uncertainty

[SOURCE: IEC 60050-311:2001, 311-06-09]

3.3
ambient temperature
average temperature of the air or another medium in the vicinity of the equipment

Note 1 to entry - During the measurement of the ambient temperature the measuring instrument/probe should be shielded from draughts and radiant heating.

[SOURCE: IEC 60050-826:2004, 826-10-03]

3.4
maximum ambient temperature
<for battery operation> highest ambient temperature at which the battery is operable and should perform according to specified requirements

[SOURCE: IEC 60050-426:2008, 426-20-17, modified — In the definition, “trace heating” has been replaced with “battery”.]

3.5
minimum ambient temperature
<for battery operation> lowest ambient temperature at which the battery is operable and should perform according to specified requirements

[SOURCE: IEC 60050-426:2008, 426-20-20, modified — In the definition, “trace heating” has been replaced with “battery”.]

3.6
ampere hour
quantity of electrical charge obtained by integrating the current in amperes with respect to time in hours

Note 1 to entry: The SI unit for electric charge is the coulomb (1 C = 1 As) but in practice it is usually expressed in ampere hours (Ah).

3.7
battery
two or more cells fitted with devices necessary for use, for example case, terminals, marking and protective devices

[SOURCE: IEC 60050-482:2004, 482-01-04, modified — In the definition, “one” has been replaced with “two”.]

3.8
battery management system
BMS
battery management unit
BMU
electronic system associated with a battery which monitors and/or manages its state, calculates secondary data, reports that data and/or controls its environment to influence the battery’s performance and/or service life

Note 1 to entry: The function of the battery management system can be fully or partially assigned to the battery pack and/or to equipment that uses this battery.

Note 2 to entry: A battery management system is also called a "battery management unit" (BMU).

Note 3 to entry: This note applies to the French language only.

Note 4 to entry: This note applies to the French language only.

3.9
idle state
<of a battery system> state of a battery which is fully functional but not actively delivering or absorbing energy

Note 1 to entry: Such a system can deliver and absorb energy on demand with a reaction time as required by the application.

Note 2 to entry: The reaction time can vary from a few milliseconds to a few seconds.

3.10
battery support system
BSS
group of interconnected and interactive parts that perform an essential task as a component of a battery system

Note 1 to entry: Such systems are for example electrolyte storage tanks and circulation pumps, cooling and heating devices, exhaust gas abatement systems, fire extinguishers, spill catchment systems, safety barriers, racks and similar facilities.

Note 2 to entry: This note applies to the French language only.

3.11
capacity
<of cells and batteries> quantity of electric charge which a cell or battery can deliver under specified discharge conditions

Note 1 to entry: The SI unit for electric charge, or quantity of electricity, is the coulomb (1 C = 1 As) but in practice, capacity is usually expressed in ampere hours (Ah).

[SOURCE: IEC 60050-482:2004, 482-03-14, modified — In the definition, “quantity of” has been added.]

3.12
charging
<of a battery> operation during which a secondary battery is supplied with electric energy from an external circuit which results in chemical changes within the cell and thus the storage of energy as chemical energy

Note 1 to entry: A charge operation is defined by its maximum voltage, current, duration and other conditions as specified by the manufacturer.

[SOURCE: IEC 60050-482:2004, 482-05-27, modified — Note 1 to entry has been added.]

3.13
constant power charge
<of a battery> operation in which the charge power input, i.e. the product of charge current and charge voltage, is held constant and where the current and voltage freely adjust according to polarization effects of the battery

3.14
discharge
operation by which a battery delivers, to an external electric circuit and under specified conditions, electric energy produced in the cells

[SOURCE: IEC 60050-482:2004, 482-03-23]

3.15
constant power discharge
<of a battery> operation in which the discharge power output, i.e. the product of discharge current and discharge voltage, is held constant and where the current and voltage freely adjust according to polarization effects of the battery

3.16
electrolyte
substance containing mobile ions that render it ionically conductive

Note 1 to entry: The electrolyte may be a liquid, solid or a gel.

[SOURCE: IEC 60050-482:2004, 482-02-29]

3.17
endurance
<of a battery> numerically defined performance during a given test simulating specified conditions of service

[SOURCE: IEC 60050-482:2004, 482-03-44]

3.18
endurance test
<of a battery> test carried out over a time interval to investigate how the properties are affected by the application of stated stresses and by their time duration or repeated application

[SOURCE: IEC 60050-151:2001, 151-16-22, modified — "<of a battery>" has been added before the definition and "of an item" has been deleted from the definition.]

3.19
energy
<of a battery> energy which a battery delivers under specified conditions

Note 1 to entry: The SI unit for energy is the joule (1 J = 1 Ws) but in practice, energy of a battery is usually expressed in watt hours (Wh) (1 Wh = 3 600 J).

Note 2 to entry: Such energy content is generally determined with a constant power (W) discharge.

Note 3 to entry: k or M are unit prefixes in the metric system denoting multiplication of the unit by one thousand (k) or one million (M).

[SOURCE: IEC 60050-482:2004, 482-03-21, modified —Notes 2 and 3 to entry have been added.]

3.20
actual energy
<of a battery> energy content value, determined experimentally at a defined instant of time with a constant power discharge at a specified rate to a specified final voltage and at a specified temperature

Note 1 to entry: This value is expressed in watt hours (Wh) and varies over the operational cycle or life of the battery.

3.21
final voltage
end-of-discharge voltage
cut-off voltage
end-point-voltage
U_{final}
<of a battery> specified voltage of a battery at which the battery discharge is terminated

[SOURCE: IEC 60050-482:2004, 482-03-30]