IEC 62620

Edition 1.0 2014-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Secondary cells and batteries containing alkaline or other non-acid electrolytes – Secondary lithium cells and batteries for use in industrial applications

Accumulateurs alcalins et autres accumulateurs à électrolyte non acide – Éléments et batteries d'accumulateurs au lithium pour utilisation dans les applications industrielles

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 62620:2014
https://standards.iteh.ai/catalog/standards/sist/0522351d-44de-4b4b-9550-
IEC 62620:2014

IEC 62620:2014-11(en-fr)

THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2014 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 Varembé
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 14 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary
More than 55 000 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.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 62620:2014
https://standards.iteh.ai/catalog/standards/sist/03225a1d-44de-4b4a-9550-1540288b8f09/iec-62620-2014

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 14 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary
Plus de 55 000 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.

IEC 62620

Edition 1.0 2014-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Secondary cells and batteries containing alkaline or other non-acid electrolytes – Secondary lithium cells and batteries for use in industrial applications

IEC 62620:2014
https://standards.iteh.ai/catalog/standards/sist/6322931d-44de-4b7a-9550-154028b8f09/iec-62620-2014

Accumulateurs alcalins et autres accumulateurs à électrolyte non acide – Éléments et batteries d'accumulateurs au lithium pour utilisation dans les applications industrielles

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX U

ICS 29.220.30

ISBN 978-2-8322-1958-4

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.

® Registered trademark of the International Electrotechnical Commission
Marque déposée de la Commission Electrotechnique Internationale

CONTENTS

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 62620:2014
https://standards.iteh.ai/catalog/standards/sist/0322531d-44de-4b4a-9550-1540288b8f09/iec-62620-2014

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 62620:2014
https://standards.iteh.ai/catalog/standards/sist/0322531d-44de-4b4a-9550-1540288b8f09/iec-62620-2014

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

SECONDARY CELLS AND BATTERIES CONTAINING ALKALINE OR OTHER NON-ACID ELECTROLYTES – SECONDARY LITHIUM CELLS AND BATTERIES FOR USE IN INDUSTRIAL APPLICATIONS

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.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 62620:2014
https://standards.iteh.ai/catalog/standards/sist/0322531d-44de-4b4a-9550-1540288b8f09/iec-62620-2014

International Standard IEC 62620 has been prepared by subcommittee 21A: Secondary cells and batteries containing alkaline or other non-acid electrolytes, of IEC technical committee 21: Secondary cells and batteries.

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

FDIS	Report on voting
21A/561/FDIS	21A/572/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 web site 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.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 62620:2014
https://standards.iteh.ai/catalog/standards/sist/0322531d-44de-4b4a-9550-1540288b8f09/iec-62620-2014

SECONDARY CELLS AND BATTERIES CONTAINING ALKALINE OR OTHER NON-ACID ELECTROLYTES – SECONDARY LITHIUM CELLS AND BATTERIES FOR USE IN INDUSTRIAL APPLICATIONS

1 Scope

This International Standard specifies marking, tests and requirements for lithium secondary cells and batteries used in industrial applications including stationary applications.

When there exists an IEC standard specifying test conditions and requirements for cells used in special applications and which is in conflict with this standard, the former takes precedence. (e.g. IEC 62660 series on road vehicles).

The following are some examples of applications that utilize the cells and batteries under the scope of this standard.

- Stationary applications: telecom, uninterruptible power supplies (UPS), electrical energy storage system, utility switching, emergency power and similar applications.
- Motive applications: fork-lift truck, golf cart, AGV, railway, and marine, excluding road vehicles.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Since this standard covers batteries for various industrial applications, it includes those requirements, which are common and minimum to the various applications.

IEC 62620:2014
https://standards.iteh.ai/catalog/standards/sist/0323531d-144b-4b4a-9550-1540288b8f05/iec-62620-2014

This standard applies to cells and batteries. If the battery is divided into smaller units, the smaller unit can be tested as the representative of the battery. The manufacturer clearly declares the tested unit. The manufacturer may add functions, which are present in the final battery, to the tested unit.

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.

IEC 60050-482:2004, *International Electrotechnical Vocabulary (IEV) – Part 482: Primary and secondary cells and batteries*

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

3 Terms and definitions

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

3.1
charge recovery
capacity recovery
capacity that a cell or battery can deliver after the charge following the charge retention test

Note 1 to entry: Charge retention is defined in 3.2.

3.2
charge retention
capacity retention
capacity that a cell or battery can deliver after storage, at a specific temperature, for a specific time without subsequent recharge as a percentage of the rated capacity

3.3
final voltage
end-of-discharge voltage
specified closed circuit voltage at which the discharge of a cell or battery is terminated

3.4
nominal voltage
suitable approximate value of the voltage used to designate or identify a cell or a battery

Note 1 to entry: The cell or battery manufacturer may provide the nominal voltage.

Note 2 to entry: The nominal voltage of a battery of n series connected cells is equal to n times the nominal voltage of a single cell.

[SOURCE: IEC 60050-482:2004, 482-03-31, modified – Addition of Notes 1 and 2 to entry.]

3.5
rated capacity
capacity value of a cell or battery determined under specified conditions and declared by the manufacturer

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Note 1 to entry: The rated capacity is the quantity of electricity C_n Ah (ampere-hours) declared by the manufacturer which a single cell or battery can deliver during a n h period when charging, storing and discharging under the conditions specified in 6.3.1. n is 5 for an E, M and H discharge rate type cell or battery. n is 8, 10, 20 or 240 for an S discharge rate type battery.

IEC 62620:2014
https://standards.iteh.ai/catalog/standards/sist/0322531d-44de-4b4c-a550-1540288b8f09/iec-62620-2014

[SOURCE: IEC 60050-482:2004, 482-03-15, modified – Addition of Note 1 to entry.]

3.6
cell
secondary lithium cell
secondary cell where electrical energy is derived from the insertion/extraction reactions of lithium ions or 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.

3.7
cell block
group of cells connected together in parallel configuration with or without protective devices (e.g. fuse or PTC) and monitoring circuitry

Note 1 to entry: 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.

3.8
module
group of cells connected together either in a series and/or parallel configuration with or without protective devices (e.g. fuse or PTC) and monitoring circuitry

3.9
battery pack
energy storage device, which is comprised of one or more cells or modules electrically connected

Note 1 to entry: It may incorporate a protective housing and be provided with terminals or other interconnection arrangement. It may include protective devices and control and monitoring, which provides information (e.g. cell voltage) to a battery system.

3.10
battery system
battery
system which incorporates one or more cells, modules or battery packs; it has a battery management system

Note 1 to entry: It may have cooling or heating units.

3.11
battery management system
BMS
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 safety, performance and/or service life and has the functions to cut off in case of over charging, over current and over heating

Note 1 to entry: The function of the BMS can be assigned to the battery pack or to equipment that uses the battery.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Note 2 to entry: A BMS is sometimes also referred to as a BMU (battery management unit).

4 Parameters measurement tolerances

IEC 62620:2014
https://standards.iteh.ai/catalog/standards/sist/0322531d-44de-4b4a-9550-1540288b3f80/iec-62620-2014

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) ±2 °C for temperature;

d) ±0,1 % for time;

e) ±1 % for dimensions.

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

5.1 Marking

The marking items shown in Table 1 are indicated on the cell, battery system or instruction manual. When marked on the cell or battery system, each cell or battery system that is installed or maintained shall carry clear and durable markings giving the information.

The following options are allowed:

- if there are designations on a battery system, designations are not necessary on the battery pack, module or cell;

- if there are designations on a battery pack, designations are not necessary on the module and cell;
- if there are designations on a module, designations are not necessary on the cell.

However, for a transportable unit (i.e. a unit that is being shipped), it is necessary to provide the marking information on the main transportable unit or in its instruction manual. Furthermore, if there is a marking matter of arrangement between the purchaser and the manufacturer, it shall comply with the agreement.

See Table 1.

Each cell or battery that is installed or maintained shall carry clear and durable markings giving the following information:

- secondary (rechargeable) Li or Li-ion;
- polarity (can be deleted if there is an agreement between cell and pack manufacturer);
- date of manufacture (which may be in code);
- name or identification of manufacturer or supplier;
- rated capacity;
- nominal voltage;
- appropriate caution statement.

iTeh STANDARD PREVIEW

The model name and manufacturing traceability shall be marked on the cell and battery surface. The other items listed above can be marked on the smallest package or supplied with the cell or the battery.

(standards.iteh.ai)

IEC 62620:2014
https://standards.iteh.ai/catalog/standards/sist/0322531d-44de-4b4a-9550-1540288b8f09/iec-62620-2014

The following information shall be marked on or supplied with the cell or the battery:

- disposal instructions;
- recommended charge instructions.

The following information shall be marked on the cell or when there is no marking place on the cell, it shall be marked in the manual.

- cell designation as specified in 5.2.

Table 1 – Marking

Marking information	Cell	Cell block Module or Battery pack	Battery system
Secondary (rechargeable) Li or Li-ion	R	R	R
Polarity (see NOTE 1)	R	R	R
Date of manufacture (which may be in code)* (see NOTE 2)	R	R	R
Name or identification of manufacturer or supplier	R	R	R [a]
Rated capacity	R	R	R [b]
Calculated rated capacity* [c]	--	--	R
Method for calculating rated capacity* [c]	--	--	R
Nominal voltage	R	R	R
Watt-hour* (see NOTE 3)	V	V	V
Appropriate caution statement (Including disposal instructions)	R	R	R
Cell designation as specified in 5.2	R	--	--
Battery designation as specified in 5.4	-	R	R
Recommended charge instructions	R	R	R
"R" = required; "V" = voluntary, "--" = unnecessary or not applicable			

a It is necessary to mark designations on the main battery system.

b Tested by main battery system; shall be indicated on the main battery system.

c If evaluated by testing the split unit of a battery system; it shall be indicated as the rated capacity and shall be the amount calculated by a reasonable method.

For example:
Measured rated capacity of module: 10 Ah
Number of modules connected in parallel: 5
Calculated rated capacity (Ah) = 10 Ah × 5 = 50 Ah

NOTE 1 There is an exception, see 5.1.

NOTE 2 The date can be in the form of a code.

NOTE 3 Watt-hour (Wh) designation on cell, module, battery pack or battery system is the rated capacity (Ah) or calculated rated capacity (Ah) as defined in table footnote [c] multiplied by the nominal voltage of the cell, module, battery pack or battery system according to the following formula:

Watt-hour (Wh) = Rated capacity (Ah) or Calculated rated capacity (Ah) × Nominal voltage (V)

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 62620:2014
https://standards.iteh.ai/catalog/standards/sist/0522551d-44de-4b4a-9550-1540288b8f09/iec-62620-2014

5.2 Cell designation

Cells shall be designated with following form:

$$A_1A_2A_3/N_2/N_3/N_4/A_4/T_LT_H/N_C$$

where

A_1 designates the negative electrode basis in which:

I is carbon;

T is titanium;

X is other material.

***A*$_2$** designates the positive electrode basis in which:

C is cobalt;

F is iron;

Fp is iron phosphate;

N is nickel;

M is manganese;

Mp is manganese phosphate;

V is vanadium;

X is other material.

***A*$_3$** designates the shape of the cell in which:

R is cylindrical;

P is prismatic (including cell with laminate film case).

***A*$_4$** designates the rate capability of the cell in which:

E is low rate long-time discharge type;

M is medium rate discharge type;

H is high rate discharge type.

NOTE 1 These types of cells are typically but not exclusively used for the following discharge rates at + 25 °C:

- E up to 0,5 I_t A,
- M up to 3,5 I_t A,
- H up to and above 7,0 I_t A.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

NOTE 2 These currents are expressed as multiples of I_t A, where I_t A = C_5 Ah/1 h (IEC 61434).

IEC 62620:2014
https://standards.iteh.ai/catalog/standards/sist/b122531d-44de-4b4a-8550-1540288b8f09/iec-62620-2014

***T*$_L$** is the low temperature grade defined in 6.3.2. The information shall be indicated by the sign + or – followed by the temperature value in °C (e.g. -30, 0, +10);

***T*$_H$** is the high temperature grade defined in 6.6.2. The information shall be indicated by the sign + or – followed by the temperature value in °C (e.g. +40, +50). If a cell is designed only for cycle application, ***T*$_H$** should be mentioned as “NA”;

***N*$_C$** is the percentage (rounded down to every 5 % step) obtained by the ratio of capacity at 500 cycles by the rated capacity. Refer to 6.6.1 and 6.3.1. If a cell is designed only for stand-by application, ***N*$_C$** should be mentioned as “NA”;

***N*$_2$** is the maximum diameter (if R) or the maximum thickness (if P) in mm rounded up to the next whole number;

N*$_3$** is the maximum width (if P) in mm rounded up to the next whole number (N*$_3$** not shown if R);

***N*$_4$** is the maximum overall height in mm rounded up to the next whole number.

NOTE 3 If any dimension is less than 1 mm, the units used are tenths of millimetres and the single number is written tN such as ”t1” for 0,1 mm.

EXAMPLE 1 ----**INR54/222/H/-20+50/70** would designate a cylindrical Li-ion secondary cell, with a nickel-based positive electrode. Its maximum diameter is between 53 mm and 54 mm, and its overall height is between 221 mm and 222 mm. It is designed for high discharge rate. Its low temperature grade is -20 °C. Its high temperature grade is 50 °C. It applies for both cycle and stand-by application. Its capacity retention after 500 cycles to rated capacity is between 70 % and 74 %.

EXAMPLE 2 ---**ICP25/150/150/E/0+60/60** would designate a prismatic Li-ion secondary cell, with a cobalt-based positive electrode. Its maximum thickness is between 24 mm and 25 mm, its maximum width is between 149 mm and 150 mm, and its overall height is between 149 mm and 150 mm. It is designed for low discharge rate over a long period. Its low temperature grade is 0 °C. Its high temperature grade is 60 °C. It applies for both cycle and stand-by application. Its capacity after 500 cycles to rated capacity is between 60 % and 64 %.

EXAMPLE 3 ---**INR50/150/M/-30NA/75** would designate a cylindrical Li-ion secondary cell, with a nickel-based positive electrode. Its maximum diameter is between 49 mm and 50 mm, and its overall height is between 149 mm and 150 mm. It is designed for medium discharge rate. Its low temperature grade is -30 °C. Its high temperature grade is NA. It applies for cycle application only. Its capacity retention after 500 cycles to rated capacity is between 75 % and 79 %.

EXAMPLE 4 ---**IMP50/240/150/M/-30+10/NA** would designate a prismatic Li-ion secondary cell, with a manganese-based positive electrode. Its maximum thickness is between 49 mm and 50 mm, its maximum width is between 239 mm and 240 mm, and its overall height is between 149 mm and 150 mm. It is designed for a medium discharge rate. Its low temperature grade is -30 °C. Its high temperature grade is 10 °C. It applies for stand-by application only.

5.3 Battery designation

5.3.1 General

Batteries shall be designated with following form:

$$A_1A_2A_3/N_2/N_3/N_4/[S_1]A_4/T_LT_H/N_C$$

where

A_1 designates the negative electrode basis in which:

- I is carbon;
- T is titanium;
- X is other materials.

A_2 designates the positive electrode basis in which:

- C is cobalt;
- F is iron;
- Fp is iron phosphate
- N is nickel;
- M is manganese;
- Mp is manganese phosphate;
- V is vanadium;
- X is other materials.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 62620:2014
https://standards.iteh.ai/catalog/standards/sist/0322531d-44de-4b4a-9550-1540288b8f09/iec-62620-2014

A_3 designates the shape of the cell in which:

- R is cylindrical;
- P is prismatic (including cell with laminate film case).

A_4 designates the rate capability of the battery in which

- S is very low rate long-time discharge type;
- E is low rate long-time discharge type;
- M is medium rate discharge type;
- H is high rate discharge type.

NOTE 1 These types of cells are typically but not exclusively used for the following discharge rates at +25 °C.

- S up to 0,125 I_t A,
- E up to 0,5 I_t A,
- M up to 3,5 I_t A,
- H up to and above 7,0 I_t A.

T_L is the low temperature grade defined in 6.3.2. The information shall be indicated by the sign + or – followed by the temperature value in °C (e.g. -30, 0, +10);

T_H is the high temperature grade defined in 6.6.2. The information shall be indicated by the sign + or – followed by the temperature value in °C (e.g. +40, +50). If a battery is designed only for cycle application, T_H should be mentioned as “NA”.

N_C is the percentage (rounded down to every 5 % step) obtained by the ratio of capacity at 500 cycles by the rated capacity. Refer to 6.6.1 and 6.3.1. If a battery is designed only for stand-by application, N_C should be mentioned as “NA”.

***N*₂** is the maximum diameter (if R) or the maximum thickness (if P) in mm rounded up to the next whole number;

$\boldsymbol{N_3}$ is the maximum width (if P) in mm rounded up to the next whole number ($\boldsymbol{N_3}$ not shown if R);

$\boldsymbol{N_4}$ is the maximum overall height in mm rounded up to the next whole number;

NOTE 2 If any dimension is less than 1 mm, the units used are tenths of millimetres and the single number is written tN such as "t1" for 0,1 mm.

$\boldsymbol{S_1}$ is the battery structure formulation shown in 5.3.2.

EXAMPLE 1 ---**ICP200/150/150/[7S]E/0+50/75** would designate a battery composed of 7S connected prismatic Li-ion secondary cells, with a cobalt-based positive electrode. Its cell maximum thickness is between 199 mm and 200 mm, its cell maximum width is between 149 mm and 150 mm, and its cell overall height is between 149 mm and 150 mm. It is designed for low discharge rate over long period. Its low temperature grade is 0 °C. Its high temperature grade is +50 °C. Its capacity after 500 cycles to rated capacity is between 75 % and 79 %.

EXAMPLE 2 ----**INR54/222[4P3S]H/-20+50/80** would designate a battery composed of 4P-3S connected cylindrical Li-ion secondary cells, with a nickel-based positive electrode. Its cell maximum diameter is between 53 mm and 54 mm, and its cell overall height is between 221 mm and 222 mm. It is designed for high discharge rate. Its low temperature grade is -20 °C. Its high temperature grade is +50 °C. Its capacity after 500 cycles to rated capacity is between 80 % and 84 %.

5.3.2 Battery structure formulation

The battery designation should include the breakdown structure of the battery. The descriptive path followed to formulate the battery is from the smallest entity to the largest one.

a) It describes the number of cells in the minimum constitutive entity and on the right side of the number describes their connection mode in series (S) or in parallel (P).

iTeh STANDARD PREVIEW
(standards.iteh.ai)

See Figures A.1 and A.2.

b) In case that the minimum constitutive entities are connected in series or in parallel, it describes the number of the minimum constitutive entities, and on the right side of the number describes their connection mode in series (S) or in parallel (P).

IEC 62620:2014
https://standards.iteh.ai/catalog/standards/sist/0322521d-44de-4b4a-9550-
1540288b8f00/iec-62620-2014

See Figures A.3 and A.4.

c) In case of the larger constitutive entities, it describes the symbols on the right side in the same way as mentioned above.

When some constitutive entities can be divided for ease of handling or transportation, these entities can be distinguished from other entities by bracketing.

Some examples are shown in Figure A.5 through Figure A.9.

5.4 Cell or battery termination

This standard does not specify cell or battery termination.

6 Electrical tests

6.1 General

Electrical tests are applied to cells and/or batteries. If the battery is divided in smaller units, the unit can be tested as the representative of the battery. The manufacturer shall clearly declare the tested unit. The manufacturer may add, to the tested unit, functions which are present in the final battery.

The manufacturer can use "cell block(s)" instead of "cell(s)" at any test that specifies "cell(s)" as the test unit in this document. The cell manufacturer shall clearly declare the test unit for each test.