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Interested committees:

Title: BS EN IEC 60623 Secondary cells and batteries containing alkaline or other non-acid electrolytes - Vented nickelcadmium prismatic rechargeable cells and batteries for use in industrial applications

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



21A/903/CD

COMMITTEE DRAFT (CD)

PROJECT NUMBER:

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2024-10-04

CLOSING DATE FOR COMMENTS:

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IEC SC 21A : SECONDARY CELLS AND BATTERIES CONTAINING ALKALINE OR OTHER NON-ACID ELECTROLYTES

SECRETARIAT:

France

SECRETARY:

Mr Jean-Marie Bodet

OF INTEREST TO THE FOLLOWING COMMITTEES:

TC 21

HORIZONTAL FUNCTION(S):

ASPECTS CONCERNED:

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TITLE:

Secondary cells and batteries containing alkaline or other non-acid electrolytes - Vented nickel-cadmium prismatic rechargeable cells and batteries for use in industrial applications.

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CONTENTS

1	CONTENTS	2
2	FOREWORD	5
3	1 Scope	7
4	2 Normative references	7
5	3 Terms and definitions	7
6	3.1 vented cell	7
7	3.2 monobloc battery	8
8	3.3 battery crate	8
9	3.4 battery tray	8
10	3.5 ageing factor	8
11	3.6 battery module	8
12	3.7 battery system battery	8
13	3.8 battery information system	8
14	3.9 end user	9
15	3.10 system integrator	9
16	3.11 manufacturer	9
17	3.13 nominal voltage	9
18	3.14 discharge voltage	9
19	3.15 rated capacity	9
20	3.16 CCCV charge	10
21	4 Parameter measurement tolerances	10
22	5 Designation and marking	10
23	5.1 Cell designation (mandatory)	10
24	5.2 Cell designation (optional)	11
25	5.3 Cell termination	11
26	5.4 Battery designation	11
27	5.4.1 Battery structure formulation	11
28	5.4.2 Definitions of components of a battery system	12
29	5.4.3 Classes of usage of battery system	14
30	5.5 Marking	15
31	5.6 Safety recommendations	15
32	6 Dimensions	16
33	7 Electrical tests	17
34	7.1 General	17
35	7.2 Charging procedure for test purposes	17
36	7.2.1 General	17
37	7.2.2 Charge procedure based on constant current	18
38	7.2.3 Charge procedure based on constant voltage at a given current	18
39	7.2.4 Rapid charge current	18
40	7.3 Discharge performances	18
41	7.3.1 General	18
42	7.3.2 Discharge performance at 20 °C	18
43	7.3.3 Discharge performance at +5 °C	19
44	7.3.4 Discharge performance at –18 °C	20
45	7.3.5 Discharge performance at low temperature	20

47	7.3.6	Discharge performance at high temperature	21
48	7.3.7	High-rate current test.....	22
49	7.3.8	Measurement of the internal DC	23
50	7.3.9	Pulse power calculation	25
51	7.3.10	Constant power measurement test.....	25
52	7.4	Charge retention	26
53	7.4.1	Test method	26
54	7.4.2	Acceptance criterion	27
55		The duration of the discharge shall be not less than 4 h.....	27
56	7.5	Endurance for cells	27
57	7.5.1	Test conditions	27
58	7.5.2	Endurance in cycles.....	27
59	7.5.3	Final test at the end of endurance in cycles	28
60	7.5.4	Permanent charge endurance.....	28
61	7.6	Charge acceptance at constant voltage.....	29
62	7.6.1	Test method	29
63	7.6.2	Acceptance criterion	29
64	7.7	Vent plug operation.....	29
65	7.8	Electrolyte retention test	30
66	7.8.1	General	30
67	7.8.2	Test method	30
68	7.8.3	Acceptance criteria	30
69	7.9	Storage.....	30
70	7.9.1	Test method	30
71	7.9.2	Acceptance criteria	30
72	7.10	Overcharge.....	30
73	8	Mechanical tests.....	30
74	9	Physical appearance	30
75	10	Requirements at battery level	31
76	10.1	General requirements	31
77	10.2	Environmental conditions	31
78	10.3	Operating voltage range of the battery system	31
79	10.4	Optional additional components to battery system.....	32
80	10.4.1	General	32
81	10.4.2	Battery information system	32
82	10.4.3	Battery heater.....	32
83	10.4.4	Thermostat or cut-off switch.....	32
84	10.4.5	Mounting racks	33
85	11	Performance requirement for the battery system.....	33
86	11.1	Design energy and power calculation methodology	33
87	11.1.1	General	33
88	11.1.2	Requirements for battery capacity sizing.....	34
89	11.1.3	Deep discharge of batteries	35
90	11.1.4	Documentation	36
91	11.2	End of life performance	36
92	12	Conditions for approval and acceptance	36
93	12.1	Type approval	36
94	12.2	Batch acceptance	37

95	Annex A (normative) CCCV charge methodology	39
96	Annex B (normative) Ni-Cd load profile verification documentation	43
97	B.1 General.....	43
98	B.2 General methodology	43
99	B.3 Battery sizing documentation	44
100	B.4 Operational verification (load profile test).....	44
101	B.5 Test report	45
102	Annex C (informative) Battery Structure Information	46
103	C.1 General.....	46
104	Annex D (informative) Declaration of cell model range representative of the testing.....	47
105	D.1 Electrical performance declaration	47
106	Bibliography.....	48
107	Figure 1 – Definition of cell(s), monobloc battery, crate, tray, and box, example of	
108	mobile application	12
109	Figure 2 – Definition of cell(s), crate/block/module, Battery, Cabinet, example of	
110	stationary application for Telecom.....	13
111	Figure 3 – Definition of cell(s), crate/block/module, Battery, rack, example of stationary	
112	application	14
113	Figure 4: Example of a vented prismatic cell in steel container with two terminals and	
114	four lugs	16
115	Figure 5: Pulsed Discharge graph showing the voltage behaviour under a current pulse	24
116	Figure 6: Example of a Ni-Cd cell discharge curve at various constant discharge	
117	currents based on percentage of capacity	32
118	Figure A.1 – Overview of charging characteristic of Ni-Cd.....	41
119		
120	Table 1 – Dimensions for vented nickel-cadmium prismatic cells in steel containers	16
121	Table 2 – Dimensions for vented nickel-cadmium prismatic cells in plastic containers.....	17
122	Table 3 – Measurement tolerances in millimetres (valid for widths and lengths)	17
123	Table 4 – Maximum values for rapid charge current <i>R</i>	18
124	Table 5 – Discharge performance at 20 °C.....	19
125	Table 6 – Discharge performance at +5 °C.....	19
126	Table 7 – Discharge performance at –18 °C.....	20
127	Table 8 – Discharge performance at low temperature	21
128	Table 9 – Discharge performance at high temperature	22
129	Table 10 – High currents values.....	22
130	Table 12 – Endurance in cycles	27
131	Table 13 – Constant voltage charging conditions	29
132	Table 14 – Charge time.....	29
133	Table 15 – Parameters and responsibility for battery capacity sizing.....	35
134	Table 16 – Sequence of tests for type approval	37
135	Table 17 – Recommended test sequence for batch acceptance	37
136	Table A.1 – Ni-Cd batteries charging characteristics	40

137

138

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**SECONDARY CELLS AND BATTERIES CONTAINING
ALKALINE OR OTHER NON-ACID ELECTROLYTES –
VENTED NICKEL-CADMIUM PRISMATIC RECHARGEABLE CELLS AND
BATTERIES FOR USE IN INDUSTRIAL APPLICATIONS**

FOREWORD

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International Standard IEC 60623 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.

This sixth edition cancels and replaces the fifth edition published in 2017 and constitutes a technical revision.

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

– to be stated when finalized.

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

FDIS	Report on voting
XXX	XXX

191
192 Full information on the voting for the approval of this standard can be found in the report on
193 voting indicated in the above table.

194 This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

195 The committee has decided that the contents of this publication will remain unchanged until
196 the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data
197 related to the specific publication. At this date, the publication will be

- 198 • reconfirmed,
199 • withdrawn,
200 • replaced by a revised edition, or
201 • amended.

202

203

SECONDARY CELLS AND BATTERIES CONTAINING ALKALINE OR OTHER NON-ACID ELECTROLYTES – VENTED NICKEL-CADMIUM PRISMATIC RECHARGEABLE CELLS AND BATTERIES FOR USE IN INDUSTRIAL APPLICATIONS

1 Scope

IEC 60623 specifies marking, designation, dimensions, tests and requirements for vented nickel-cadmium prismatic secondary single cells and battery systems made of them.

NOTE In this context, "prismatic" refers to cells having rectangular sides and base.

When there exists an IEC standard specifying test conditions and requirements for cells used in special applications and which is in conflict with this document, the former takes precedence.

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

IEC 60417-5005:2002-10, *Graphical symbols for use on equipment* (available from: <http://www.graphical-symbols.info/equipment>)

IEC 61434, Secondary cells and batteries containing alkaline or other non-acid electrolytes – Guide to the designation of current in alkaline secondary cell and battery standards

IEC 62485 2:2010 Safety requirements for secondary batteries and battery installations - Part 2: Stationary batteries

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-482 and the following 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>

3.1 vented cell

secondary cell having a cover provided with an opening through which products of electrolysis and evaporation are allowed to escape freely from the cell to the atmosphere

Note 1 to entry: The opening may be fitted with a venting system.

3.2 monobloc battery

battery with multiple separate but electrically connected cell compartments each of which is designed to house an assembly of electrodes, electrolyte, terminals or interconnections and possible separators.

Note 1 to entry: The cells in a monobloc battery can be connected in series or in parallel.

Note 2 to entry: See 5.4.2

[SOURCE: IEC 60050-482:2004, 482-02-17, modified – Note 2 to entry has been added.]

3.3 battery crate

container with frame walls for holding several cells or batteries.

Note 1 to entry: See 5.4.2.

[SOURCE: IEC 60050-482:2004/AMD1:2016, 482-05-10, modified – Note 1 to entry has been added.]

3.4 battery tray

container with a base and walls for holding several cells or batteries.

Note 1 to entry: See 5.4.2.

[SOURCE: IEC 60050-482:2004/AMD1:2016, 482-02-35, modified – Note 1 to entry has been added.]

3.5 ageing factor

quantitative factor expressing the degradation in the ability of the battery, due to usage, to deliver electrical energy under specified operating conditions such as, but not limited to, operating ambient temperature, cycling considering depth of discharge (DOD), and maintenance practices

3.6 battery module

group of cells connected together either in a series and/or parallel configuration without protective devices (e.g. fuse or temperature sensor)

3.7 battery system battery

system that also includes battery tray(s), battery crate(s), monobloc(s), battery module(s), electronic components and/or equipment and associated electromechanical connections. Any component necessary to obtain the safety and durability of the battery system is included (e.g. battery thermal management system, BTMS).

Note 1 to entry: See 8.1.3.1

Note 2 to entry: The battery system manufacturer can be the end user or the equipment manufacturer, in case they install e.g. heating/cooling systems, ventilation common to the global equipment but needed for the battery,

3.8 battery information system

electronic system collecting and analyzing battery data to provide additional information, i.e. information not necessary for battery operation

Note 1 to entry: Additional information can be information about e.g. condition-based maintenance.

3.9 end user

organization which operates the battery system

Note 1 to entry: The end user is normally an organization which operates the device equipped with the battery system, unless the responsibility is delegated to a main contractor or consultant.

3.10 system integrator

organization which has the technical responsibility of the complete battery system and charging system

Note 1 to entry: The system integrator can be the end user or the equipment manufacturer, or none of them.

3.11 manufacturer

organization which has the technical responsibility for its scope of supply

Note 1 to entry: The manufacturer can be the equipment manufacturer or the system integrator of a battery system, a cell manufacturer, etc. If necessary to explicitly distinguish, "equipment manufacturer", "battery system manufacturer" or "cell manufacturer" is expressed.

**3.12 cumulated requested service
CRS**

total amount of service requested by the buyer or the end user, expressed in duration (months or years) or delivered energy in kWh, under e.g representative ambient and operating conditions as expressed

Note 1 to entry: Refer to 8

3.13 nominal voltage

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

Note 1 to entry: The nominal voltage of a vented nickel-cadmium rechargeable single cell is 1,2 V.

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 – Replacement of the words "a battery or an electrochemical system" by "or a battery" and addition of Notes 1 and 2 to entry.]

3.14 discharge voltage

<cell or battery> voltage between the terminals of a cell or battery when being discharged

[SOURCE: IEC 60050-482:2004, 482-03-28]

3.15 rated capacity

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

Note 1 to entry: The rated capacity is the quantity of electricity C_5 Ah (ampere-hours) declared by the manufacturer which a single cell can deliver during a 5 h period when charging, storing and discharging under the conditions specified in 7.3.2.

[SOURCE: IEC 60050-482:2004, 482-03-15, modified – Addition of the words "a cell or" in the definition, and of Note 1 to entry.]

3.16 CCCV charge

method of charge consisting in a charge at constant current followed by a charge at constant voltage

4 Parameter measurement tolerances

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

- a) ± 1 % for voltage;
- b) ± 1 % for current;
- c) ± 2 °C for temperature;
- d) $\pm 0,1$ % for time;
- e) ± 1 % for capacity.

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 Designation and marking

5.1 Cell designation (mandatory)

Vented nickel-cadmium prismatic secondary single cells shall be designated by the letter "K" followed by a letter L, M, H or X which signifies:

- low rate of discharge (L);
- medium rate of discharge (M);
- high rate of discharge (H);
- very high rate of discharge (X).

NOTE 1 These types of cells are typically but not exclusively used for the following discharge rates:

- L up to $0,5 I_t$ A;
- M up to $3,5 I_t$ A;
- H up to $7,0 I_t$ A;
- X up to and above $7,0 I_t$ A.

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

NOTE 3 In case the cells have internal separations but a common electrolyte, they are still considered as a single cell

This group of two letters shall be followed by a group of figures indicative of the rated capacity of the cell in ampere-hours. Cells that have been tested at 20 °C and 5 °C but not at –18 °C shall carry an additional marking of T5: for example: KH 185 or KH 185 T5.

As an option, cells in cases of plastic material shall be designated by the letter "P" after the figures (for example: KH 185 P), or in case of steel cells with a letter "S".

358

359 **5.2 Cell designation (optional)**

360 The additional marking shall be added to the mandatory marking. When the marking would
361 exceed the available space on the cell, this information may be omitted on the cell but shall
362 be provided in the documentation corresponding to the cell and in the type test report, or in a
363 shared IT system accessible to the end-user based on information on the cell label (e.g. data
364 matrix).

365 If there is no mention concerning the marking for temperature, the cells shall have been
366 tested at: -18°C , 5°C and 20°C . Cells tested at other temperatures shall carry an additional
367 marking of T followed by tested temperatures. In case the cell is characterized with both low
368 and high temperature, they shall be indicated in increasing order with a solidus separating
369 them: for example: KH 185 P T-35/+45.

370 Cells tested with CCCV charges shall carry the marking of CCCV: for example,
371 KH 185 P CCCV.

372 Cells tested at rapid charge shall carry the marking R and the value of the tested rapid charge
373 current, expressed in multiple of I_t A: for example, KH 185 P R1.

374 High grade cycling cells shall carry an additional marking C followed by the number of cycles:
375 for example, KH 185 P C1500.

376 Cells having been tested with multiple types of tests shall carry the marking for the various
377 tests performed: for example, KH 185 P T-35/+45 CCCV R1 C1500.

378 **5.3 Cell termination**

379 This document does not specify cell termination.

380 **5.4 Battery designation**

381 **5.4.1 Battery structure formulation**

382 Modules, battery packs and battery systems are preferably designated as described below.

383 In case of batteries where there are cells in series with crates or modules with different
384 number of same capacity cells, the detailed information is not necessary in the designation, it
385 is a constructive information already provided in the drawing.

386 Cells Designation as per 5.1 or 5.2 followed by the battery structure formulation:

387 a) it describes the number of cells in the minimum constitutive(s) entity(ies) and on the
388 right side of the number, it describes their connection mode in series (S) or in parallel (P).

389 See Annex C (informative) including some examples
390

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

394 See Annex C (informative) including some examples.

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:

EXAMPLE 1 "KM130(80S)" would designate a prismatic vented nickel-cadmium battery. Its rated capacity is 130 Ah with 80 cells. It is designed for a medium discharge rate.

EXAMPLE 2 "KH100((2P)84S)" would designate a prismatic vented nickel-cadmium battery system. Its rated capacity is 100 Ah. It is designed for a high discharge rate.

5.4.2 Definitions of components of a battery system

In order to clarify the definitions, this chapter presents practical examples

See Figure 1 (images are examples) for the case of mobile applications.

Monobloc battery

Single cells / no LRU

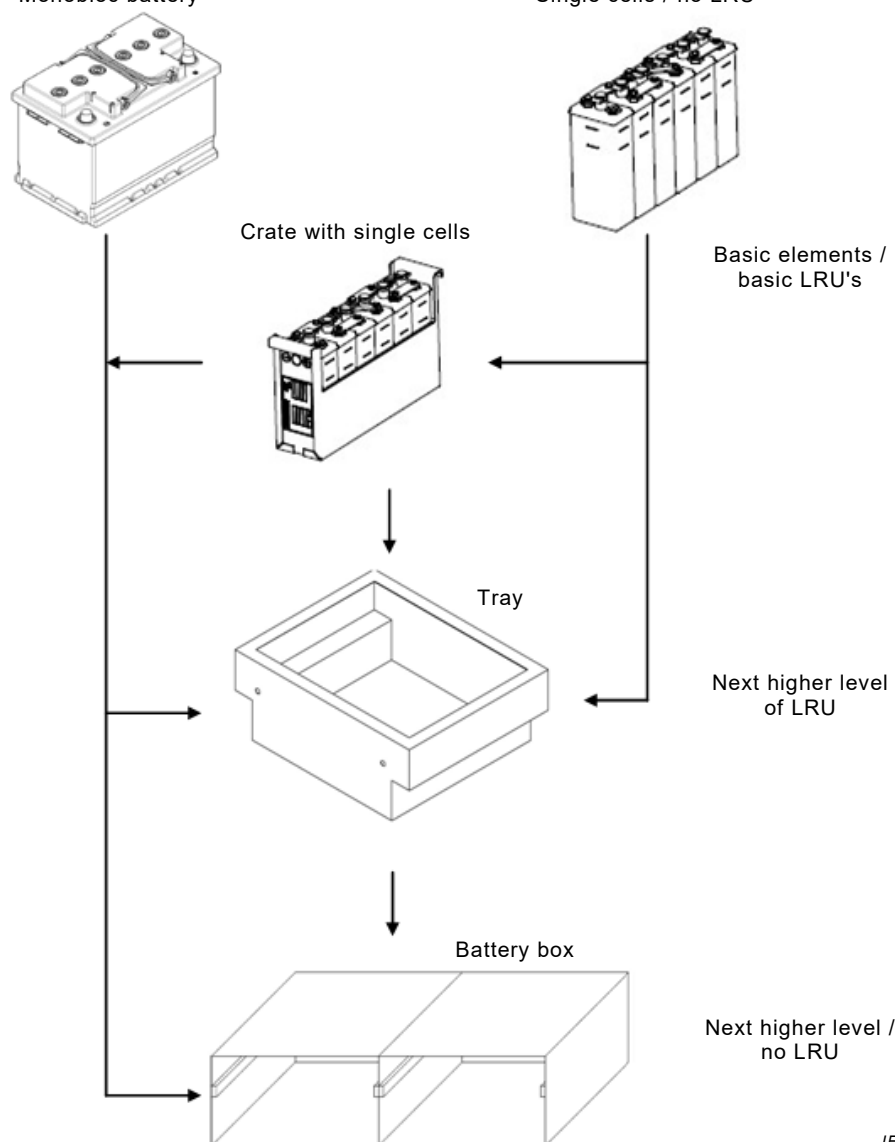


Figure 1 – Definition of cell(s), monobloc battery, crate, tray, and box, example of mobile application

Some batteries may not include all the above components, e.g. single cells may be installed in a tray without crates. Some battery technologies may include further components (e.g. module) in the parts of this standard series if necessary.

411 For the case of stationary applications, see Figure 2 and Figure 3 - schematics as examples,
412 with reference to Annex C provided.

413

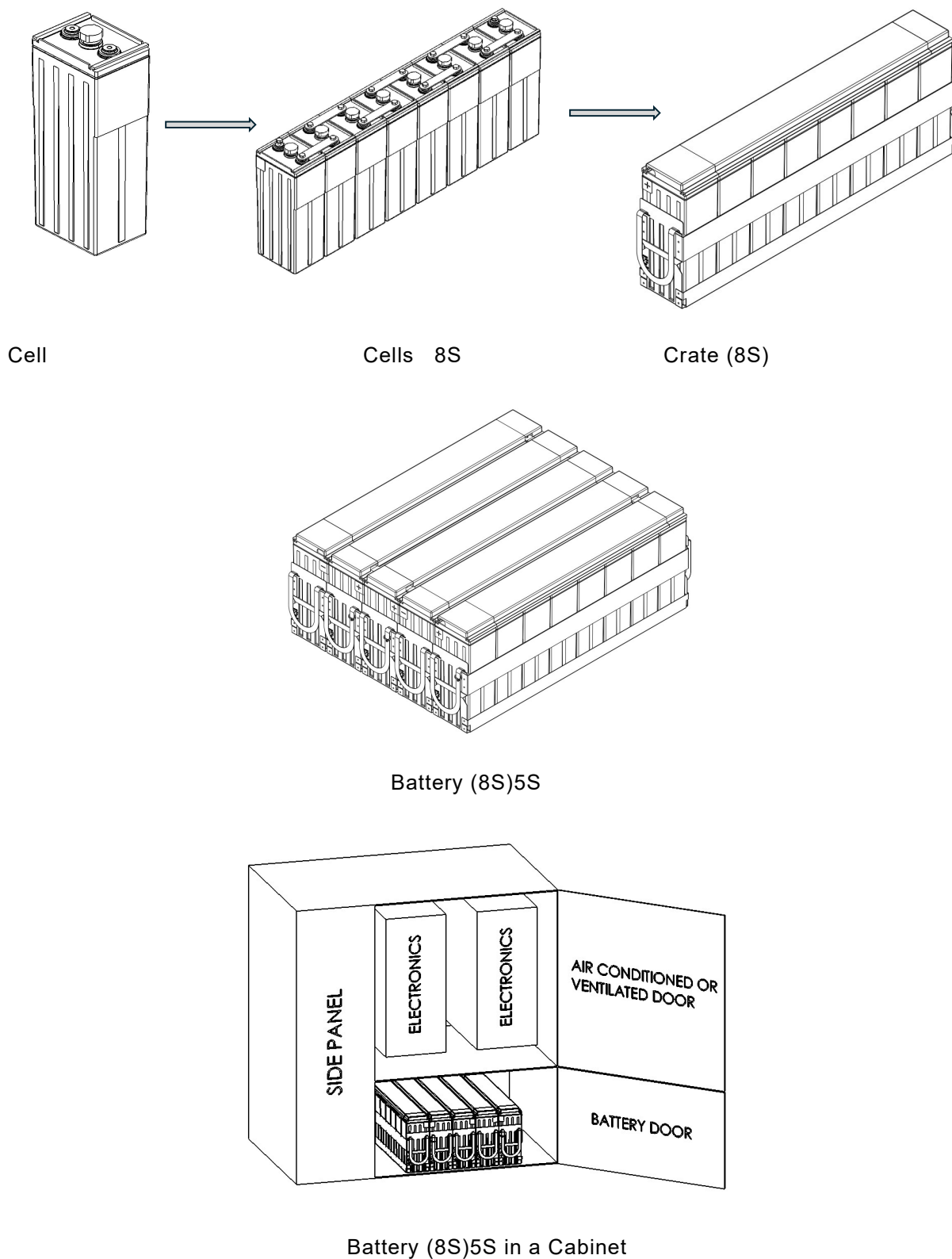


Figure 2 – Definition of cell(s), crate/block/module, Battery, Cabinet, example of stationary application for Telecom