

DRAFT TANZANIA STANDARD

(Draft for comments only)

Secondary cells and batteries containing alkaline or other non-acid electrolytes-Portable sealed rechargeable single cells

Part 1: Nickel-cadmium

TANZANIA BUREAU OF STANDARDS

© TBS 2017 First Edition 2017

0 National Foreword

This draft Tanzania Standard is being prepared by the Cells and Batteries Technical Committee, under the supervision of the Electrical Engineering Divisional Standards Committee (EEDC)

This draft Tanzania Standard is an adoption of the International Standard IEC 61951-1:2013

Secondary cells and batteries containing alkaline or other non-acid electrolytes-Portable sealed rechargeable single cells Part 1: Nickel-cadmium, which has been prepared by the International Electrotechnical Commission (IEC).

Terminology and conventions

Some terminologies and certain conventions are not identical with those used in Tanzania Standards; Attention is drawn especially to the following:

- 1) The comma has been used as a decimal marker for metric dimensions. In Tanzania Standards, it is current practice to use "full point" on the baseline as the decimal marker.
- 2) Where the words "International Standard(s)" appear, referring to this standard they should read "Tanzania Standard(s)".



Edition 4.0 2017-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Secondary cells and batteries containing alkaline or other non-acid electrolytes – Secondary sealed cells and batteries for portable applications – Part 1: Nickel-cadmium

Accumulateurs alcalins et autres accumulateurs à électrolyte non acide – Accumulateurs étanches pour applications portables – Partie 1: Nickel-cadmium

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ISBN 978-2-8322-4010-6

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

F(JREWORD		5
1	Scope		7
2	Normat	tive references	7
3	Terms	and definitions	7
4	Parame	eter measurement tolerances	g
5	Cell and ha	attery designation and marking	g
Ü	5.1	Cell and battery designation	g
	5.1.1	Small prismatic cells and cylindrical cells	g
	_	Button cells	11
	5.1.2	Batteries	11
	5.2	Cell or battery termination	11
	5.3	Marking	11
	5.3.1	Small prismatic cells and cylindrical cells	11
		Button cells	12
	5.3.3	Batteries	12
	5.4	Exemption of wording	12
6		ions	12
Ŭ	6.1	Small prismatic cells and cylindrical cells	12
	_	General	12
		Small prismatic cells	13
		Cylindrical cells	13
	6.2	Button cells	15
7		al tests	16
•	7.1	General	16
	7.1	Charging procedure for test purposes	16
	7.2.1		16
		Charging procedure for battery	16
	7.3	Discharge performance	17
		General	17
		Discharge performance at 20 °C	17
		Discharge performance at –18 °C	19
	7.3.4	Discharge performance for rapid charge cells (R cells)	20
	7.4	Charge (capacity) retention	20
	7.5	Endurance	20
	7.5.1	Endurance in cycles	20
	7.5.2	Permanent charge endurance	24
	7.6	Charge acceptance at constant voltage	28
	7.7	Overcharge	28
	7.7.1	Small prismatic cells	28
	7.7.2	L, M, H or X cylindrical and button cells	29
	7.7.3	LT/LU, MT/MU or HT/HU cylindrical cells	29
	7.7.4	J cylindrical cells	29
	7.7.5	JT cylindrical cells	30
	7.7.6	R cylindrical cells	30
	7.8	Safety device operation	31

8.9.1	Button cells or batteries storage, small prismatic cells or batteries storage,	
	cylindrical cells or batteries storage	31
7.10	Charge acceptance at +55 °C for LT, MT or HT cylindrical cells	32
7.11	Trickle charge acceptance for JT cylindrical cells	32
7.12	Internal resistance	33
7.12	.1 General	33
7.12		33
7.12	.3 Measurement of the internal DC resistance	34
8 Mec	hanical tests	34
9 Safe	ety requirements	34
10 Type	approval and batch acceptance	34
10.1	General	34
10.2	Type approval	35
10.2	.1 Type approval for small prismatic cells	35
10.2	.2 Type approval for cylindrical and button cells	35
10.2	.3 Type approval for batteries	37
10.3	Batch acceptance	38
ibliography		40
_	– Jacketed cylindrical cells	
•	Jacketed small prismatic cells	13
•	Jacketed cells dimensionally interchangeable with primary cells	14
Figure 4	– Button cells	15
	Dimensions of jacketed small prismatic cells	13
Table 2 –	Dimensions of jacketed cylindrical cells dimensionally interchangeable with	
tray of		14
	Dimensions of jacketed cylindrical cells not dimensionally interchangeable	15
•		°C for LT, MT or HT cylindrical cells 32 for JT cylindrical cells 32 ce 33 at of the internal AC resistance 33 at of the internal DC resistance 34 ance 34 ance 34 ance 34 ance 34 ance 34 ance 35 ral for small prismatic cells 35 ral for batteries 37 ral for small prismatic cells 14 spells 13 spells 14 spells 14
	Dimensions of button cells	
	Discharge performance at 20 °C for small prismatic cells and cylindrical cells	17
Table 6 –	Discharge performance at 20 °C for button cells	18
Table 7 –	Discharge performance at 20 °C for batteries	18
Table 8 –	Rated capacity (mAh) compliance test (example)	19
Table 9 –	Discharge performance at –18 °C for small prismatic cells	19
	Discharge performance at –18 °C for cylindrical cells	19
	– Discharge performance at –18 °C for button cells	
	Endurance in cycles for small prismatic cells and cylindrical cells not	
	nally interchangeable with primary cells	21
	Endurance in cycles for cylindrical cells dimensionally interchangeable with	
rimay cells		
	- Endurance in cycles for H or X cells	22
Table 15	Endurance in cycles for cylindrical X cells	22
Table 16	Endurance in cycles for HR or XR cells	23
Table 17	- Endurance in cycles for button cells	23
Tahla 18	— Permanent charge endurance for L. M. I. H. or Y cylindrical cells	2/

IEC 61951-1:2017 © IEC 2017

Table 19 – Permanent charge endurance for button cells	24
Table 20 – Permanent charge endurance for LT, MT, or HT cylindrical cells	26
Table 21 – Permanent charge endurance for LU, MU, or HU cylindrical cells	28
Table 22 – Overcharge at 0 °C	29
Table 23 – Capacity deterioration due to storage period for cells or batteries	32
Table 24 – Charge and discharge at +55 °C	32
Table 25 – Trickle charge acceptance for JT cylindrical cells	33
Table 26 – Constant discharge currents used for measurement of DC resistance	34
Table 27 – Sequence of tests for type approval for small prismatic cells	35
Table 28 – Sequence of tests for type approval for cylindrical cells	36
Table 29 – Sequence of tests for type approval for button cells	37
Table 30 – Sequence of tests for type approval for batteries	38
Table 31 – Recommended test sequence for batch acceptance	39

-4-

INTERNATIONAL ELECTROTECHNICAL COMMISSION

SECONDARY CELLS AND BATTERIES CONTAINING ALKALINE OR OTHER NON-ACID ELECTROLYTES – SECONDARY SEALED CELLS AND BATTERIES FOR PORTABLE APPLICATIONS –

Part 1: Nickel-cadmium

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.

International Standard IEC 61951-1 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 fourth edition cancels and replaces the third edition published in 2013 of which it constitutes a technical revision.

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

- addition of battery type;
- revision of Figure 3 (6.1.3.1);

-6-

IEC 61951-1:2017 © IEC 2017

- 3.1 addition of "Optional pip" note to positive contact;
- 3.2 changed leader line position from pip to flats of positive contact (B and G).

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

FDIS	Report on voting
21A/622/FDIS	21A/630/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.

A list of all parts of the IEC 61951 series can be found, under the general title Secondary cells and batteries containing alkaline or other non-acid electrolytes – Secondary sealed cells and batteries for portable applications, on the IEC website.

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

- 3.1 reconfirmed,
- 3.2 withdrawn,
- 3.3 replaced by a revised edition, or
- 3.4 amended.

This is a preview - click here to buy the full publication

IEC 61951-1:2017 © IEC 2017

-7-

SECONDARY CELLS AND BATTERIES CONTAINING ALKALINE OR OTHER NON-ACID ELECTROLYTES – SECONDARY SEALED CELLS AND BATTERIES FOR PORTABLE APPLICATIONS –

Part 1: Nickel-cadmium

1 Scope

This part of IEC 61951 specifies marking, designation, dimensions, tests and requirements for secondary sealed nickel-cadmium small prismatic, cylindrical and button cells and batteries, suitable for use in any orientation, for portable applications.

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 (IEV) – Part 482: Primary and secondary cells and batteries

IEC 60086-1, Primary batteries - Part 1: General

IEC 60086-2, Primary batteries - Part 2: Physical and electrical specifications

IEC 61959, Secondary cells and batteries containing alkaline or other non-acid electrolytes – Mechanical tests for sealed portable secondary cells and batteries

IEC 62133-1, Secondary cells and batteries containing alkaline or other non-acid electrolytes

– Safety requirements for portable sealed secondary cells and for batteries made from them, for use in portable applications – Part 1: Nickel systems

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

nominal voltage

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

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