भारतीय मानक

Indian Standard

IS 6303 (Part 3) : 2024
IEC 60086-3 : 2021

(Superseding IS 11675 : 1986)

प्राथमिक बैटरियाँ
भाग 3 घड़ियों की बैटरियाँ

Primary Batteries
Part 3 Watch Batteries

ICS 29.220.10; 39.040.10

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December 2024 **Price Group 10**

Primary Cells and Batteries Sectional Committee, ETD 10

NATIONAL FOREWORD

This Indian Standard (Part 3) which is identical to IEC 60086-3 : 2021 'Primary batteries — Part 3: Watch batteries' issued by the International Electrotechnical Commission (IEC) was adopted by the Bureau of Indian Standards on the recommendation of the Primary Cells and Batteries Sectional Committee and approval of the Electrotechnical Division Council.

This standard was first published in 1986 as IS 11675 : 1986, which was an indigenous Indian Standard on 'Specification for button cells — Silver oxide'. Consequent upon the reviewing of IEC 60086-3 : 2021, this adoption has been taken up in IS 6303 series under dual numbering to align it with the latest IEC standard IEC 60086-3 : 2021, this Indian Standard supersedes IS 11675 : 1986.

This standard is published in various parts. Other parts in this series are:

Part 0	General
Part 4	Safety of lithium batteries
Part 5	Safety of batteries with aqueous electrolyte

The text of the IEC standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appears referring to this standard, they should be read as 'Indian Standard'; and

b) Comma (,) has been used as a decimal marker, while in Indian Standards the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to International Standards for which Indian Standards also exist. The corresponding Indian Standards, which are to be substituted, are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
IEC 60086-1 Primary batteries — Part 1: General	IS 6303 : 2018/IEC 60086-1 : 1982 Primary batteries — General (*second revision*)	Modified
IEC 60086-2 Primary batteries — Part 2: Physical and electrical specifications	IS 15063 : 2001/IEC 60086-2 : 1994 Alkaline manganese dioxide cells — Specification	Modified
IEC 60086-4 Primary batteries — Part 4: Safety of lithium batteries	IS 6303 (Part 4) : 2023/IEC 60086-4 : 2007 Primary batteries: Part 4 safety of lithium batteries (*third revision*)	Identical

The Committee has reviewed the provisions of the following international standards referred in this adopted standard and decided that they are acceptable for use in conjunction with this standard.

International Standard	*Title*
IEC 60086-5	Primary batteries — Part 5: Safety of batteries with aqueous electrolyte

(*Continued on third cover*)

CONTENTS

INTRODUCTION

This part of IEC 60086 provides specific requirements and information for primary watch batteries. This part of IEC 60086 was prepared through joint work between the IEC and ISO to benefit primary battery users, watch designers and battery manufacturers by ensuring the best compatibility between batteries and watches.

This part of IEC 60086 will remain under continual scrutiny to ensure that the publication is kept up to date with the advances in both battery and watch technologies.

NOTE Safety information is available in IEC 60086-4 and IEC 60086-5.

Indian Standard

PRIMARY BATTERIES

PART 3 WATCH BATTERIES

1 Scope

This part of IEC 60086 specifies dimensions, designation, methods of tests and requirements for primary batteries for watches. In several cases, a menu of test methods is given. When presenting battery electrical characteristics and/or performance data, the manufacturer specifies which test method was used.

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 60086-1, *Primary batteries – Part 1: General*

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

IEC 60086-4, *Primary batteries – Part 4: Safety of lithium batteries*

IEC 60086-5, *Primary batteries – Part 5: Safety of batteries with aqueous electrolyte*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60086-1 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
capacitive reactance
part of the internal resistance that leads to a voltage drop during the first seconds under load

3.2
capacity
electric charge (quantity of electricity) which a cell or battery can deliver under specified discharge conditions

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

3.3
fresh battery
undischarged battery 60 days maximum after date of manufacture

3.4
ohmic drop
part of the internal resistance that leads to a voltage drop immediately after switching the load on

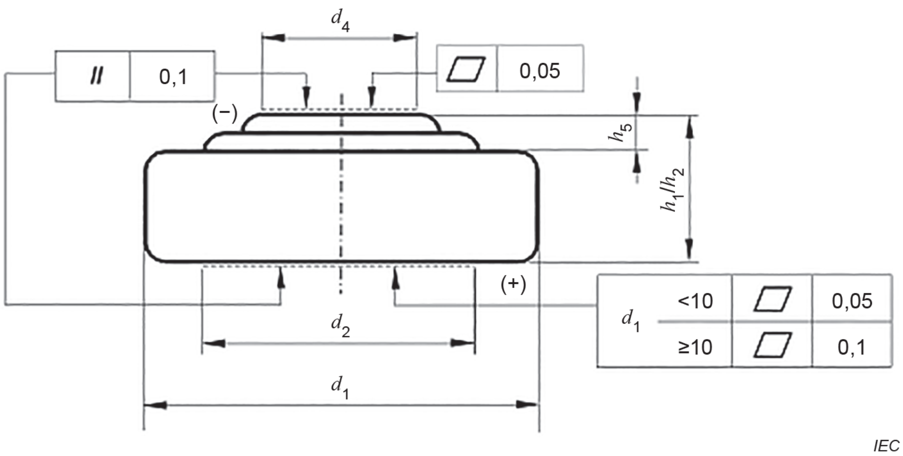
4 Physical requirements

4.1 Battery dimensions, symbols and size codes

Dimensions and tolerances of batteries for watches shall be in accordance with Figure 1, Table 1 and Table 2. The dimensions of the batteries shall be tested in accordance with 7.1.

The symbols used to denote the various dimensions in Figure 1 are in accordance with IEC 60086-2:2021, Clause 4.

Dimensions in millimetres



Key

h_1 maximum overall height of the battery

h_2 minimum distance between the flats of the positive and negative contacts

h_5 minimum projection of the flat negative contact

d_1 maximum and minimum diameter of the battery

d_2 minimum diameter of the flat positive contact

d_4 minimum diameter of the flat negative contact

NOTE This numbering follows the harmonization in the IEC 60086 series.

Figure 1 – Dimensional drawing

Table 1 – Zinc systems L and S dimensions and size codes

Dimensions in millimetres

Diameter			d_4	Height h_1/h_2												
Code[a]	d_1	Tolerance		Code[a]												
				10	12	14	16	20	21	26	27	30	31	36	42	54
				Tolerances												
				0 −0,10	0 −0,15	0 −0,15	0 −0,18	0 −0,20	0 −0,20	0 −0,20	0 −0,20	0 −0,20	0 −0,25	0 −0,25	0 −0,25	0 −0,25
4	4,8	0 −0,15		1,05			1,65		2,15							
5	5,8	0 −0,15	2,6	1,05	1,25		1,65		2,15		2,70					
6	6,8	0 −0,15	3,0			1,45	1,65		2,15	2,60						
7	7,9	0 −0,15	3,5		1,25	1,45	1,65		2,10	2,60			3,10	3,60		5,40
9	9,5	0 −0,15	4,5	1,05	1,25	1,45	1,65	2,05			2,70			3,60		
11	11,6	0 −0,20	6,0				1,65	2,05				3,05		3,60	4,20	5,40

NOTE Open boxes in the above matrix are not necessarily available for standardization due to the concept of overlapping tolerances.

[a] See Annex A.

Table 2 – Lithium systems B and C dimensions and size codes

Dimensions in millimetres

Diameter			d_4	Height h_1/h_2						
Code[a]	d_1	Tolerance		Code[a]						
				12	16	20	25	30	32	50
				Tolerances						
				0 −0,15	0 −0,18	0 −0,20	0 −0,20	0 −0,20	0 −0,25	0 −0,30
10	10,0	0 −0,15	3,0				2,50			
12	12,5	0 −0,25	4,0		1,60	2,00	2,50			
16	16	0 −0,25	5,0	1,20	1,60	2,00			3,20	
20	20	0 −0,25	8,0	1,20	1,60		2,50		3,20	
23	23	0 −0,25	8,0			2,00	2,50			
24	24,5	0 −0,25	8,0					3,00		5,00

NOTE Open boxes in the above matrix are not necessarily available for standardization due to the concept of overlapping tolerances.

[a] See Annex A.

4.2 Terminals

Negative contact (–):	The negative contact (dimension d_4) shall be in accordance with Table 1 and Table 2. This is not applied to those batteries with a two-step negative contact.
Positive contact (+):	The cylindrical surface is connected to the positive terminal. Positive contact should be made to the side of the battery but may be made to the base.

4.3 Projection of the negative terminal (h_5)

The dimension h_5 shall be as follows:

$h_5 \geq 0{,}02$ for $h_1/h_2 \leq 1{,}65$

$h_5 \geq 0{,}06$ for $1{,}65 < h_1/h_2 < 2{,}5$

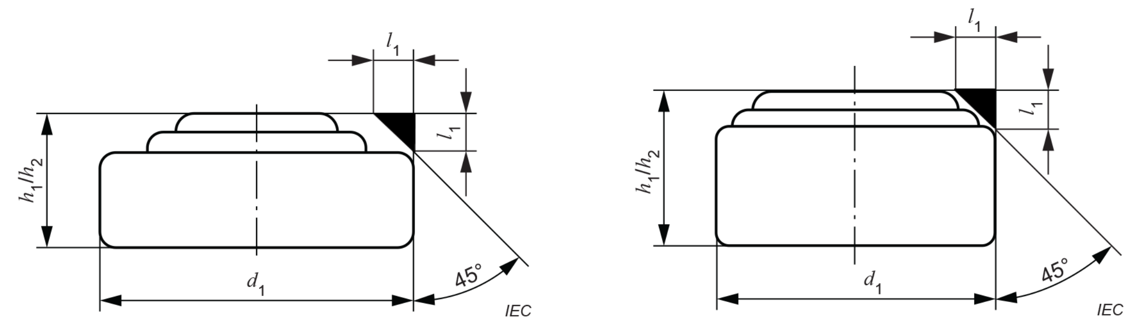
$h_5 \geq 0{,}08$ for $h_1/h_2 \geq 2{,}5$

The negative contact should be the highest point of the battery.

4.4 Shape of battery

The space requirements shall secure the area enclosed by an angle of 45° (see Figure 2).

The values of l_1, for different heights of h_1/h_2, are given in Table 3.



a) **Figure 2a** b) **Figure 2b**

Figure 2 – Shape of battery

Table 3 – Values of l_1

Dimensions in millimetres

h_1/h_2	l_1
$1 < h_1/h_2 \leq 1{,}90$	0,20
$1{,}90 < h_1/h_2 \leq 3{,}10$	0,35
$3{,}10 < h_1/h_2 \leq 3{,}60$	0,50
$3{,}60 < h_1/h_2 \leq 4{,}20$	0,70
$4{,}20 < h_1/h_2 \leq 5.40$	0,80
$5{,}40 < h_1/h_2$	0,90

4.5 Mechanical resistance to pressure

A force F (N), as specified in Table 4, applied for 10 s through a steel ball of 1 mm diameter, at the centre of each contact area, shall not cause any deformation prejudicial to the proper functioning of the battery, i.e. after this test, the battery shall pass the tests specified in Clause 7.

Table 4 – Applied force F by battery dimensions

Battery dimensions		Force
d_1 mm	h_1/h_2 mm	F N
< 7,9	<3,0	5
	≥3,0	10
≥ 7,9	<3,0	10
	≥3,0	10

4.6 Deformation

Refer to IEC 60086-1 for dimensional stability.

4.7 Leakage

Undischarged batteries and, if required, batteries tested according to 7.2.6 shall be examined as stated in 7.3. The acceptable number of defects shall be agreed between the manufacturer and the purchaser.

4.8 Marking

4.8.1 General

The battery and/or its packaging must be marked with the following:

a) designation according to normative Annex A, or common;

b) expiration of a recommended usage period or year and month or week of manufacture.

The year and month or week of manufacture may be in code. The code is composed of the last digit of the year and of a number indicating the month. October, November and December should be represented by the letters O, Y and Z respectively;

EXAMPLE

91: January 2019;

9Y: November 2019.

c) polarity of the positive (+) terminal;

d) nominal voltage;

e) name or trade mark of the supplier;

f) cautionary advice;

g) caution for ingestion of batteries shall be given. Refer to IEC 60086-4:2019, 7.2 a) and 9.2, and IEC 60086-5:2016, 7.1 l) and 9.2, for details.

NOTE Examples of the common designations can be found in Annex D of IEC 60086-2:2015.

Battery marking should not impede electrical contact. The designation and the polarity shall be marked on the battery. All other markings may be given on the packing instead of the battery.

4.8.2 Disposal

Marking of batteries with respect to the method of disposal shall be in accordance with local legal requirements.

5 Electrical requirements

5.1 Electrochemical system, nominal voltage, end-point voltage and open-circuit voltage

The requirements concerning the electrochemical system, the nominal voltage, the end-point voltage and the open-circuit voltage are given in Table 5.

Table 5 – Standardised electrochemical systems

Letter	Negative electrode	Electrolyte	Positive electrode	Nominal voltage (U_n) V	End-point voltage (EV) V	Open-circuit voltage (U_{OC} or OCV) V	
						Max.	Min.
B	Lithium (Li)	Organic electrolyte	Carbon monofluoride $(CF)_x$	3,0	2,0	3,70	3,00
C	Lithium (Li)	Organic electrolyte	Manganese dioxide (MnO_2)	3,0	2,0	3,70	3,00
L	Zinc (Zn)	Alkali metal hydroxide	Manganese dioxide (MnO_2)	1,5	1,0	1,68	1,50
S	Zinc (Zn)	Alkali metal hydroxide	Silver oxide (Ag_2O)	1,55	1,2	1,63	1,55

5.2 Closed circuit voltage U_{cc} (CCV), internal resistance and impedance

Closed circuit voltage and internal resistance shall be measured according to 7.2.

AC impedance should be measured with an LCR meter.

Limit values shall be agreed between the manufacturer and the purchaser.

5.3 Capacity

The capacity shall be agreed between the manufacturer and the purchaser on the basis of a continuous discharge test, according to 7.2.6.

5.4 Capacity retention

The capacity retention is the ratio between the capacities under the given discharge conditions measured on fresh batteries and a sample of the same lot stored during 365 days at (20 ± 2) °C and a relative humidity between (55 ± 20) %.

The ratio of capacity retention shall be agreed between the manufacturer and the purchaser. The minimum value should be at least 90 % for a period of 12 months. The capacity measurement is carried out according to 7.2.6.

For the purpose of verifying compliance with this document, conditional acceptance may be given after completion of the initial capacity tests.

6 Sampling and quality assurance

The use of sampling plans or product quality indices should be agreed between manufacturer and purchaser.

Where no agreement is specified, refer to ISO 2859 and ISO 21747 for sampling and quality compliance assessment advice.

7 Test methods

7.1 Shape and dimensions

7.1.1 Shape requirement

The shape of the negative contact is checked preferably by optical projection or by an open gauge according to Figure 3.

The measurement method shall be agreed between the manufacturer and the purchaser.

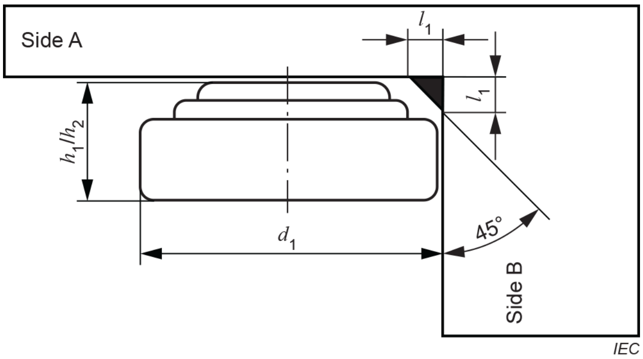


Figure 3 – Shape requirement

Procedure:
The procedure to inspect with the open gauge is shown. The battery is moved toward the side A of the gauge while applying the outer periphery of the positive electrode to the side B and maintaining the flat part of the negative electrode terminal at 90 ° with respect to the side B. A battery having a gap without contact between the side A of the gauge and the flat part of the negative electrode terminal does not satisfy the requirements.

NOTE The surface of the open gauge is made of non-conductive hard resin to prevent external short circuit.

7.2 Electrical characteristics

7.2.1 Environmental conditions

Unless otherwise specified, the sample batteries shall be tested at a temperature of (20 ± 2) °C and a relative humidity between (55^{+20}_{-40}) %.

During use, batteries can be exposed to low temperatures; it is therefore recommended to carry out complementary tests at (0 ± 2) °C and at (−10 ± 2) °C.

7.2.2 Equivalent circuit – Effective internal resistance – DC method

Resistance of any electrical component is determined by calculating the ratio between the voltage drop ΔU across this component and the range of current Δi passing through this component and causing the voltage drop $R = \Delta U / \Delta i$.

NOTE As an analogy, the internal DC resistance R_i of any electrochemical cell is defined by the following relation:

$$R_i\ (\Omega) = \frac{\Delta U\ (\text{V})}{\Delta i\ (\text{A})} \tag{1}$$

The internal DC resistance is illustrated by the schematic voltage transient as given below in Figure 4.

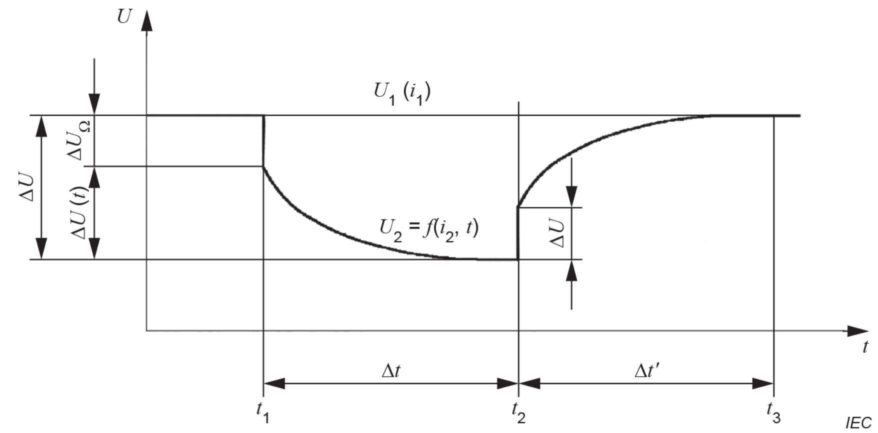


Figure 4 – Schematic voltage transient

As can be seen from the diagram in Figure 4, the voltage drop ΔU of the two components differs in nature, as shown in the following relation:

$$\Delta U = \Delta U_\Omega + \Delta U(t) \tag{2}$$

The first component ΔU_Ω for ($t = t_1$) is independent of time (ohmic drop), and results from the increase in current Δi according to the relation:

$$\Delta U_\Omega = \Delta i \times R_\Omega \tag{3}$$

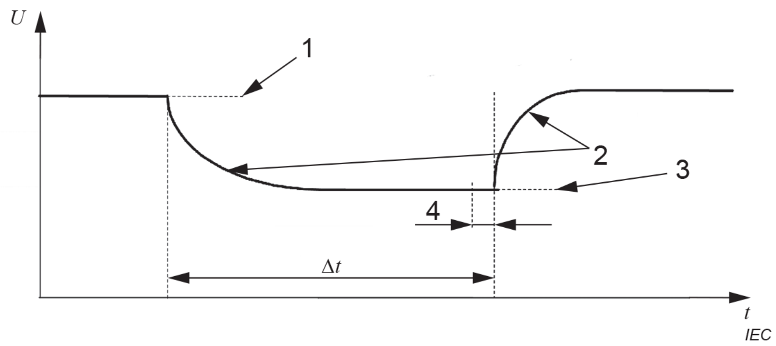
In this relation, R_Ω is a pure ohmic resistance. The second component ΔU (t) is time dependent and is of electrochemical origin (capacitive reactance).

7.2.3 Equipment

The equipment used for the voltage measurements shall have the following specifications:

- accuracy: ≤ 0,25 %;
- precision: ≤ 50 % of last digit;
- internal resistance: ≥ 1 MΩ;
- measurement time: in the tests proposed in the following subclauses, it is important to make sure that the measurement is taken during the flat period of the voltage transient (see Figure 5). Otherwise, a measurement error due to the capacitive reactance may occur (lower internal resistance).

The time $\Delta t'$ necessary for the measurement shall be brief in comparison to Δt, and the measurement equipment compatible with these criteria.



Key

1 open-circuit voltage U_{oc} (OCV)

2 effect of capacitive reactance

3 closed circuit voltage U_{cc} (CCV)

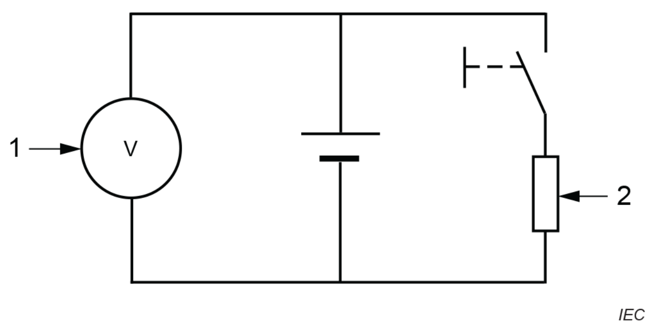
4 $\Delta t'$ (measurement U_{cc})

Figure 5 – Curve: $U = f(t)$

7.2.4 Measurement of open-circuit voltage U_{oc} (OCV) and closed circuit voltage U_{cc} (CCV)

Refer to Figure 6:

First measurement	U_{oc}: The switch is left open while this measurement is being carried out.
Next measurement	U_{cc}: The battery being tested shall be connected to the load R_m. The switch shall be left closed during the duration Δt according to Table 6.



Key

1 reading U_{cc} / U_{oc}

2 R_m resistance of measurement

Figure 6 – Circuitry principle

Table 6 – Test method for U_{cc} (CCV) measurement

Test method	Battery with KOH electrolyte [a]		All other batteries	
	R_m Ω	Δt s	R_m Ω	Δt ms
A [b]	150 ± 0,5 %	1 ± 5 %	1 500 ± 0,5 %	10 ± 5 %
B [c]	150 ± 0,5 %	0,5 – 2	470 ± 0,5 %	500 – 2 000
C [d]	200 ± 0,5 %	5 ± 5 %	2 000 ± 0,5 %	7,8 ± 5 %

R_m should take into consideration the resistance of the connection lines of the battery being tested and the contact resistance of the switch.

[a] Application with high peak current.

[b] Method A (recommended test): requires specialised test equipment.

[c] Method B: to be used in the absence of method A test equipment.

[d] Method C: to be used only by agreement between the manufacturer and the purchaser.

7.2.5 Calculation of the internal resistance R_i

The internal resistance may be determined by the following calculation:

$$R_i = \frac{U_{oc} - U_{cc}}{U_{cc} / R_m} \quad (4)$$

NOTE The relation U_{cc} / R_m corresponds to the current delivered through the discharge resistance R_m (see 7.2.4).

7.2.6 Measurement of the capacity

7.2.6.1 General

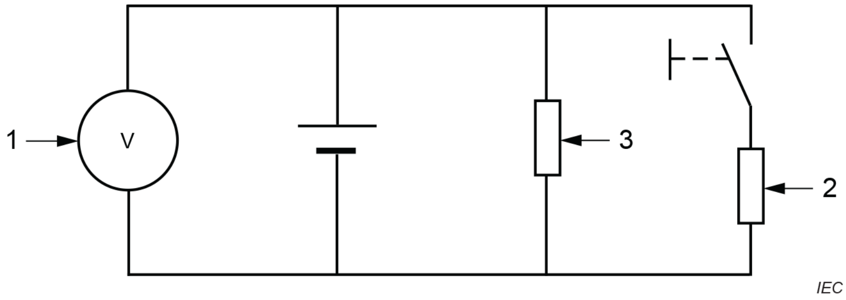
There are two methods for measuring capacity:

– the recommended method is method A, which is more indicative of watch requirements;
– method B is a more general method and is already specified in IEC 60086-1 and IEC 60086-2.

When presenting capacity data, the manufacturer shall specify which test method was used.

7.2.6.2 Method A

a) Circuitry principle (see Figure 7).



Key

1 reading U_{cc} / U'_{oc}

2 R_m resistance of measurement

3 R_d resistance of continuous discharge

Figure 7 – Circuitry principle for method A

b) Procedure

The duration of the discharge test at the resistor R_d approximates to 30 days.

Value of the resistance R_d: the value of the resistive load shall include all parts of the external circuit and shall be accurate to within ±0,5 %.

c) Determination of the capacity

The measurements of the open-circuit voltage U'_{oc} and that of the closed circuit voltage U_{cc} are carried out at least once a day on the battery permanently connected to R_d, until the first passage of the U_{cc} under the end-point voltage defined in Table 5 is obtained.

1) First measurement U'_{oc}: the resistance R_d being much higher than R_m, U'_{oc} approximates to U_{oc}.

   The switch is left open while the measurement is being carried out.

2) Next measurement U_{cc}: the battery being tested is connected to R_m. The switch is left closed during the duration Δt according to Table 7.

Table 7 – Test method A for U_{cc} (CCV) measurement

Batteries with KOH electrolyte		All other batteries	
R_m Ω	Δt s	R_m Ω	Δt ms
150 ± 0,5 %	1 ± 5 %	1 500 ± 0,5 %	10 ± 5 %

3) Calculation of the capacity C: the capacity of the battery is obtained by adding the partial capacity amounts C_p, calculated after each measurement by the following formula:

$$C_p = \frac{U'_{oc} \times t_i}{R_d} \quad (5)$$

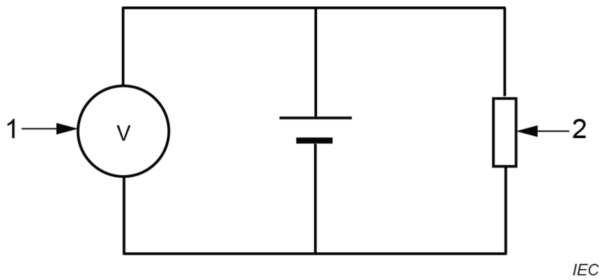
   where t_i is the time between two measurements

$$C = \Sigma\, C_p \quad (6)$$

4) Near the end of discharge, it is recommended to carry out several measurements of U'_{oc} a day in order to obtain sufficient accuracy.

7.2.6.3 Method B

a) Circuitry principle (see Figure 8).



Key

1 reading U_{cc}

2 R_d resistance of continuous discharge

Figure 8 – Circuitry principle for method B

b) See procedure in 7.2.6.2 b).

c) Determination of the capacity: when the on-load voltage of the battery under test drops for the first time below the specified end point voltage as specified in Table 5, the time *t* is calculated and defined as service life.

The capacity is calculated by the following formula:

$$C = \frac{U_{cc}\text{ (average)}}{R_d} t \quad (7)$$

where

C	is the capacity;
U_{cc}(average)	is the average voltage value of U_{cc} during discharge duration time (0 – t);
t	is the service life.

7.2.7 Calculation of the internal resistance R_i during discharge in case of method A (optional)

After each measurement of U'_{oc} and U_{cc} is carried out according to the procedure described in 7.2.6, it is possible to calculate the internal resistance R_i of the battery by using the following formula:

$$R_i = \frac{U'_{oc} - U_{cc}}{U_{cc} / R_m} \quad (8)$$

7.3 Test methods for determining the resistance to leakage

7.3.1 Preconditioning and initial visual examination

Before carrying out the tests specified in 7.3.2 and 7.3.3, the batteries shall be submitted to a visual examination according to the requirements stated in Clause 8.

For tests in 7.3.2.1 and 7.3.2.2, batteries shall be pre-stored at the specified temperature (40 °C and 45 °C respectively) for 2 h. Batteries shall be moved from the preconditioning (alternative pre-stored) chamber (or oven) into the high temperature and humidity test chamber within minutes in order to avoid cooling of the battery and the risk of condensation at elevated humidity.

7.3.2 High temperature and humidity test

7.3.2.1 Recommended test

The battery shall be stored under the conditions specified in Table 8.

Table 8 – Storage conditions for the recommended test

Temperature °C	Relative humidity %	Test time days
40 ± 2	90 to 95	30 or 90
The test time of 30 days may be used for an accelerated routine quality control test, whereas the test time of 90 days applies to qualification testing of new batteries.		

7.3.2.2 Optional test

After agreement between the manufacturer and purchaser, the following testing conditions may be chosen (see Table 9).

Table 9 – Storage conditions for optional test

Temperature °C	Relative humidity %	Test time days
45 ± 2	90 to 95	20 or 60
The test time of 20 days may be used for an accelerated routine quality control test, whereas the test time of 60 days applies to qualification testing of new batteries.		

7.3.3 Test by temperature cycles

The battery shall be submitted to 150 temperature cycles according to the schedule in Figure 9:

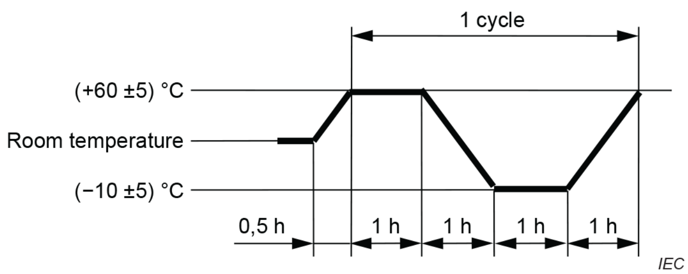


Figure 9 – Test by temperature cycles

8 Visual examination and acceptance conditions

8.1 Preconditioning

Before carrying out the initial visual examination or after the tests specified in Clause 7, the batteries shall be stored for at least 24 h at room temperature and at a relative humidity between (55 ± 20) %.

The leakage should be observed after crystallisation of the electrolyte. The time of the storage of 24 h can be prolonged if necessary. This examination may be applied to new or used batteries, or to batteries which have been submitted to different tests.

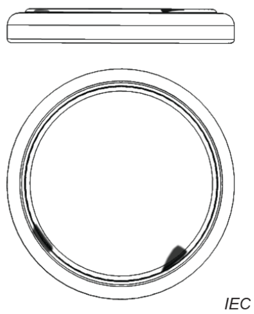
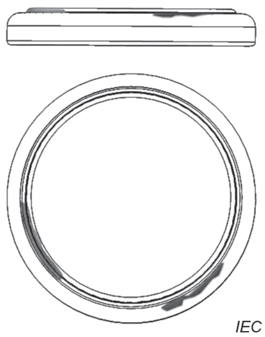
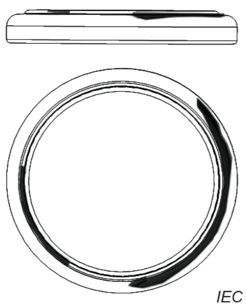
8.2 Magnification

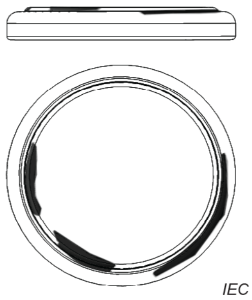
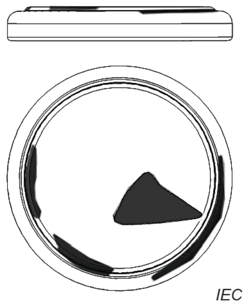
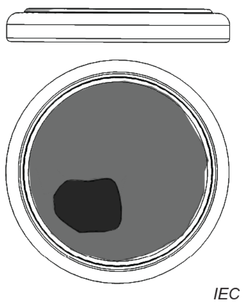
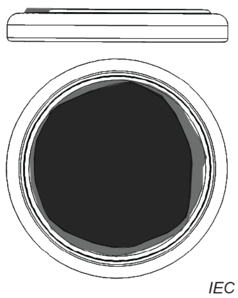
The visual examination shall be carried out at a magnification of x15.

8.3 Leakage levels and classification

The visual examination shall be carried out under a diffuse white light of 900 lx to 1 100 lx at the surface of the battery to be inspected (see Table 10).

Table 10 – Leakage levels and classification

Leakage levels		Diagram	Definition
Classification	Grade		
Salting	S1		Little salting found near the gasket, affecting less than 10 % of the perimeter of the gasket, detected while observing at a magnification of x15. The leak is not detectable with the naked eye.
	S2		Traces of salting near gasket can be detected with the naked eye. At a magnification of x15, it may be noted that these salts affect more than 10 % of the perimeter of the gasket.
	S3		Salt spreads on both sides of the gasket can be detected with the naked eye, but do not reach the flat of the negative contact.

Leakage levels		Diagram	Definition
Classification	Grade		
Clouds	C1		Leaks spread in clouds on both sides of the gasket, do reach the flat of the negative contact but do not reach the central part of the flat negative contact.
	C2		Leaks spread in clouds, which reach the central part of the flat negative contact.
Leaks	L1		The accumulation of crystallised liquid coming from the electrolyte swells up on part of the cloud spread, which covers the entire surface of the flat negative contact.
	L2		The accumulation of crystallised liquid coming from the electrolyte swells up on the entire cloud spread, which covers the entire surface of the flat negative contact.

8.4 Acceptance conditions

The acceptable level, as well as the proportion of defective pieces, shall be agreed between the manufacturer and the purchaser.

Fresh batteries, with a level of leakage exceeding S1, shall not be submitted for qualification. The acceptance criteria may be less restrictive for batteries which have been tested according to 7.3.2. If necessary, photographic references may be established.

Annex A
(normative)

Designation

Watch batteries manufactured with the express purpose of complying with this document should be designated by a system of coded letters and numbers as shown below. However, the letter W is used to indicate compliance with IEC 60086-3.

EXAMPLE: S R 7 21 S W

- S — Electrochemical system letter according to Table 5
- R — Round cell: (according to IEC 60086-1)
- 7 — Dimension: diameter in millimetres
- 21 — Dimension: height in tenths of millimetres
- S — Electrolyte:
  - S: Sodium hydroxide NaOH (optional)
  - P: Potassium hydroxide KOH (optional)

    Letter P may be left out in the case of electrochemical system letter S.
  - Organic electrolyte: null
- W — Letter W: compliance with IEC 60086-3

Bibliography

IEC 60068-2-78:2001, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

ISO 2859, *Sampling procedures for inspection by attributes*

ISO 8601:2004, *Data elements and interchange formats – Information interchange – Representation of dates and times*

ISO 21747, *Statistical methods – Process performance and capability statistics for measured quality characteristics*

(*Continued from second cover*)

Only English language text has been retained while adopting it in this Indian Standard, and as such the page numbers given here are not the same as in the International Standard.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

This Indian Standard has been developed from Doc No.: ETD 10 (26064).

Amendments Issued Since Publication

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