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TEST REPORT N°: DBIA-ESH-P26020709

TEST REPORT

To:	Guangdong Liwang New Energy Co.,Ltd.	To:	-
Attn:	-	Attn:	-
Address:	No 10,LianTangJiao 2nd Road,TangXia Town ,DongGuan City,GuangDong Province ,China	Address:	-
Fax:	0769-87887512	Fax:	-
E-mail:	qa1@liwangbattery.com	E-mail:	-

This document includes: 30 pages

Manufacturer:	Guangdong Liwang New Energy Co.,Ltd.		
Location:	No 10,LianTangJiao 2nd Road,TangXia Town ,DongGuan City,GuangDong Province ,China	Sample No:	ESH260211/029
	Test date:	Feb.11, 2026~ April 03, 2026	
	Issued date:	April 15, 2026	
	Standards used: (Date):	1.IEC 60086-1:2021+COR1:2022 EN IEC 60086-1:2021+AC:2022 2.IEC 60086-2:2021+COR1:2022 EN IEC 60086-2:2021+AC:2022 3.IEC 60086-5:2021+COR1:2022 EN IEC 60086-5:2021+AC:2022	
	Clauses examined:	1.All clauses except 6.2 2.All clauses except delayed discharge test 3.All clauses	
	Re-testing:	None	
Primary battery / LR03 / 1,5V		Remark / Note:	See page 2

CONCLUSION:

The samples satisfy the clauses examined.

Test done by.
Project Engineer

Thresh Dong.

-Thresh Dong

Approved by,
Project Manager

Amy Dong

-Amy Dong

-This report is governed by, and incorporates by reference, the Conditions of Testing as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/> and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. Statements of conformity are based on simple acceptance criteria without taking measurement uncertainty into account, unless otherwise requested in writing. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.

BVLCIE CHINA
必维欧亚电气技术咨询服务(上海)有限公司

Building 4, No. 518, Xin Zhuan Road,
CaoHejing Songjiang High-Tech Park,
Shanghai P.R.C (201612)
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Tel: +86 21 6195 7000
Fax: +86 21 6195 7001
Email: BVLCIEMKT@bureauveritas.com

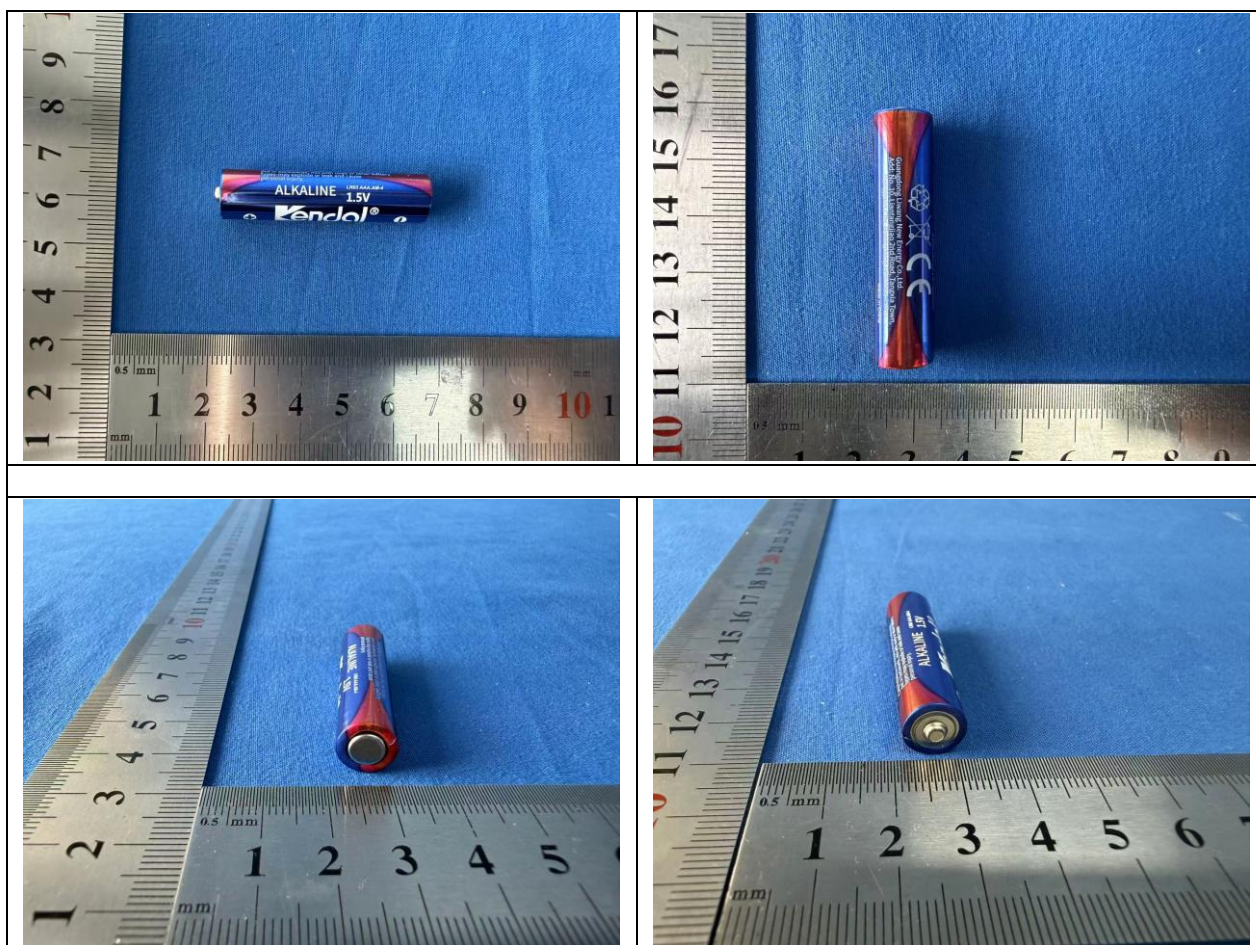
TEST REPORT FOR IEC/EN 60086-1, IEC/EN 60086-2 and IEC/EN 60086-5 V2.0

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HISTORICAL OF SAMPLE RECEIVED

LCIE CHINA RECORDED N°	DETAIL OF THE SAMPLE	SPECIAL REMARKS
ESH260211/029	Original samples	None

PICTURE OF THE SAMPLE TESTED





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Description:	Primary battery
Trademark:	
System:	Alkaline
Factory:	Guangdong Liwang New Energy Co.,Ltd.
Designation:	LR03
Rated Voltage (V):	1,5V
Other information on battery	--

Possible test case verdicts:	
- test object does meet the requirement :	P (Pass)
- test case does not apply to the test object :	NA (Not Applicable)
- test object does not meet the requirement :	F (Fail)
- test object does not demand	ND (Not Demanded)
General remarks:	
"(See remark #)" refers to a remark appended to the report.	
Throughout this report a ☒ comma / ☐ point is used as the decimal separator.	

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IEC 60086-1			
Clause	Requirement + Test	Result - Remark	Verdict
4	REQUIREMENTS		P
4.1	General		P
4.1.1	Design		P
	Primary batteries are sold mainly in consumer markets. In recent years, they have become more sophisticated in both chemistry and construction, for example both capacity and rate capability have increased to meet the growing demands from new, battery-powered equipment technology.		P
	When designing primary batteries, the aforementioned considerations shall be taken into account. Specifically, their dimensional conformity and stability, their physical and electrical performance and their safe operation under normal use and foreseeable mis-use conditions shall be assured.		P
	Additionally, information on equipment design can be found in Annex B.		NA
4.1.2	Battery dimensions		P
	The dimensions for individual types of batteries are given in IEC 60086-2 and IEC 60086-3.	LR03	P
4.1.3	Terminals		P
4.1.3.1	General		P
	Terminals shall be in accordance with Clause 6 of IEC 60086-2.		P
	Their physical shape shall be designed in such a way that they ensure that the batteries make and maintain good electrical contact at all times.		P
	They shall be made of materials that provide adequate electrical conductivity and corrosion protection.		P
4.1.3.2	Contact pressure resistance		NA
	Where stated in the battery specification tables or the individual specification sheets in IEC 60086-2, the following applies.		NA

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IEC 60086-1			
Clause	Requirement + Test	Result - Remark	Verdict
	A force of 10 N applied through a steel ball of 1 mm diameter at the centre of each contact area for a period of 10 s shall not cause any apparent deformation which might prevent satisfactory operation of the battery.		NA
4.1.3.3	Cap and base		P
	This type of terminal is used for batteries which have their dimensions specified according to Figures 1 to 7 of IEC 60086-2 and which have the cylindrical side of the battery insulated from the terminals		P
4.1.3.4	Cap and case		NA
	This type of terminal is used for batteries which have their dimensions specified according to Figures 8, 9, 10, 14, 15 and 16 of IEC 60086-2, but in which the cylindrical side of the battery forms part of the positive terminal		NA
4.1.3.5	Screw terminals		NA
	This contact consists of a threaded rod in combination with either a metal or insulated metal nut.		NA
4.1.3.6	Flat contacts		NA
	These are essentially flat metal surfaces adapted to make electrical contact by suitable contact mechanisms bearing against them.		NA
4.1.3.7	Flat or spiral springs		NA
	These contacts comprise flat metal strips or spirally wound wires which are in a form that provides pressure contact.		NA
4.1.3.8	Plug-in-sockets		NA
	These are made up of a suitable assembly of metal contacts, mounted in an insulated housing or holding device and adapted to receive corresponding pins of a mating plug.		NA
4.1.3.9	Snap fasteners		NA
4.1.3.9.1	General		NA

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IEC 60086-1			
Clause	Requirement + Test	Result - Remark	Verdict
	These contacts are composed of a combination comprising a stud (non-resilient) for the positive terminal and a socket (resilient) for the negative terminal.		NA
	They shall be of suitable metal so as to provide efficient electrical connection when joined to the corresponding parts of an external circuit.		NA
4.1.3.9.2	Snap fastener		NA
	This type of terminal consists of a stud for the positive terminal and a socket for the negative terminal. These shall be made from nickel plated steel or other suitable material		NA
	They shall be designed to provide a secure physical and electrical connection, when fitted with similar corresponding parts for connection to an electrical circuit		NA
4.1.3.10	Wire		NA
	Wire leads shall be single or multi-strand flexible insulated tinned copper. The positive terminal wire covering shall be red and the negative black.		NA
4.1.3.11	Other spring contacts or clips		NA
	These contacts are generally used on batteries when the corresponding parts of the external circuit are not precisely known. They shall be of spring brass or of other material having similar properties.		NA
4.1.4	Classification (electrochemical system)		P
	Primary batteries are classified according to their electrochemical system.	LR03	P
	Each system, with the exception of the zinc-ammonium chloride, zinc chloride-manganese dioxide system, has been allocated a letter denoting the particular system.	Alkaline	P
	The electrochemical systems that have been standardized up to now are given in Table 1.		P
4.1.5	Designation		P

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IEC 60086-1			
Clause	Requirement + Test	Result - Remark	Verdict
	The designation of primary batteries is based on their physical parameters, their electrochemical system as well as modifiers, if needed.		P
	A comprehensive explanation of the designation system (nomenclature) can be found in Annex C.	LR03	P
4.1.6	Marking		P
4.1.6.1	General (see Table 4)		P
	For an overview of marking requirements refer to Table 2. With the exception of small batteries (see 4.1.6.2), each battery shall be marked with the following information:		NA
	a) designation, IEC or common;	LR03	P
	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;	06-2030	P
	c) polarity of the positive (+) terminal;	“+”	P
	d) nominal voltage;	1,5V	P
	e) name or trade mark of the manufacturer or supplier;		P
	f) cautionary advice.	On the battery	P
4.1.6.2	Marking of small batteries (see Table 4)		P
	a) Some batteries, mainly category 3 and category 4 batteries have a surface too small to accommodate all markings shown in 4.1.6.1. For these batteries the designation 4.1.6.1a) and the polarity 4.1.6.1c) shall be marked on the battery. All other markings shown in 4.1.6.1 may be given on the immediate packing instead of on the battery. The nominal voltage may be marked either 1,4 V or 1,45 V.		P
	b) For P-system batteries, 4.1.6.1a) may be on the battery, the sealing tab or the package. 4.1.6.1c) may be marked on the sealing tab and/or on the battery. 4.1.6.1b), 4.1.6.1d) and 4.1.6.1e) may be given on the immediate packing instead of on the battery.		NA

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IEC 60086-1			
Clause	Requirement + Test	Result - Remark	Verdict
	c) Caution for ingestion of swallowable batteries shall be given. Refer to current valid versions of IEC 60086-4 and IEC 60086-5 for details. Copyright International		NA
4.1.6.3	Marking of batteries regarding method of disposal		P
	Marking of batteries with respect to the method of disposal shall be in accordance with local legal requirements.	This information added in the battery.	P
4.1.7	Interchangeability: battery voltage		NA
	Primary batteries as presently standardized in the IEC 60086 series can be categorized by their standard discharge voltage U_s . For a new battery system, its interchangeability by voltage is assessed for compliance with the following formula: $n \times 0,85 U_r \leq m \times U_s \leq n \times 1,15 U_r$		NA
4.2	Performance		P
4.2.1	Discharge performance	See Table 2	P
	Discharge performance of primary batteries is specified in IEC 60086-2.	Only performed initial discharge performance	P
4.2.2	Dimensional stability		P
	The dimensions of batteries shall conform with the relevant specified dimensions as given in IEC 60086-2 and IEC 60086-3 at all times during discharge testing under the standard conditions	No deformation. only height and dimension were measured	P
4.2.3	Leakage		P
	When batteries are stored and discharged under the standard conditions given in this specification, no leakage shall occur	No leakage	P
4.2.4	Open-circuit voltage limits	See Table 1	P
	The maximum open-circuit voltage of batteries shall not exceed the values given in Table 1:		P
4.2.5	Service output		NA
	Discharge durations, initial and delayed, of batteries shall meet the requirements given in IEC 60086-2.		NA

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IEC 60086-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.2.6	Safety		P
	When designing primary batteries, safety under conditions of intended use and foreseeable mis-use as prescribed in IEC 60086-4 and IEC 60086-5 shall be considered.		P
4.2.7	Validity of testing		NA
	Portable primary batteries shall be subjected to the tests, as required in the 60086 series. Test results remain valid until a design change or requirement revision has been made. Retesting is required when:		NA
	a) a battery specification changes by more than 0,1 g or 20 % mass, whichever is greater, for the cathode, anode or electrolyte;		NA
	b) a battery specification changes that would lead to a failure of any of the tests;		NA
	c) there is an addition of new tests or requirements; or		NA
	d) there is a requirement change that would lead to a failure on any of the tests.		NA
5	PERFORMANCE – TESTING		P
5.1	General		P
	For the preparation of standard methods of measuring performance (SMMP) of consumer goods, refer to Annex E.		P
	A capacity of a primary battery may be established by electrical discharge tests as detailed in D.2.3.		P
	However, under consumer usage conditions, the capacities realised from electrical discharge test methods can vary.		P
	The following factors/variables dramatically impact on optimum capacity realisation.		P
	a) The current demand from the external electrical circuit/device.		P



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IEC 60086-1			
Clause	Requirement + Test	Result - Remark	Verdict
	b) The frequency of current demand. (Continuous or intermittent usage).		P
	c) The minimum voltage at which the device will satisfactorily operate. (Cut off voltage).		P
	d) The temperature of operation.		P
5.2	Discharge testing		P
5.2.1	General		P
	The discharge tests in this standard fall into two categories:		P
	– application tests;		P
	– Service output tests.		NA
5.2.2	Application tests		P
5.2.2.1	General		P
	Application tests may be accelerated by discharge load, daily period duty cycle, or both. The specified values for load and time intermittency should take the following factors into consideration.		P
	– discharge efficiency of the battery relative to the application.		P
	– typical duty cycle use patterns for the application.		P
	– total time to conduct the test not to exceed 30 days.		P
5.2.2.2	Application tests with multiple loads		NA
	For application test with multiple loads, the load order during a cycle shall start with the heaviest load and move to the lightest load unless otherwise specified.		NA
5.2.3	Service output tests		NA
	For service output tests, the value of the load resistor should be selected such that the service output approximates 30 days.		NA



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IEC 60086-1			
Clause	Requirement + Test	Result - Remark	Verdict
	When full capacity is not realized within the required time scale, the service output may be extended to the shortest suitable duration thereafter by selecting a discharge load of lower ohmic value, as defined in 6.4.		NA
5.3	Conformance check to a specified minimum average duration	See Table 2	P
	In order to check the conformance of a battery to any discharge tests specified in IEC 60086-2 and 60086-3, the test shall be carried out as follows.		P
	a) Test eight batteries		P
	b) Calculate the average without the exclusion of any result.		P
	c) If this average is equal to or greater than the specified figure and no more than one battery has a service output of less than 80 % of the specified figure, the batteries are considered to conform to service output.		P
	d) If this average is less than the specified figure and/or more than one battery has a service output of less than 80 % of the specified figure, repeat the test on another sample of eight batteries and calculate the average as previously.		NA
	e) If the average of this second test is equal to or greater than the specified figure and no more than one battery has a service output of less than 80 % of the specified figure, the batteries are considered to conform to service output.		NA
	f) If the average of the second test is less than the specified figure and/or more than one battery has a service output of less than 80 % of the specified figure, the batteries are considered not to conform and no further testing is permitted.		NA
	g) For the purposes of verifying compliance with this document, conditional acceptance shall be given after completion of the initial discharge tests.		NA
5.4	Guidance for considering proposed value of minimum average duration		P

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IEC 60086-1			
Clause	Requirement + Test	Result - Remark	Verdict
	This guidance is described in Annex F.		P
5.5	OCV testing	See Table 1	P
	Open-circuit voltage shall be measured with the voltage measuring equipment specified in 6.8.1.		P
5.6	Insulation resistance		NA
	For batteries with insulating labels, cases or jackets, the resistance between externally exposed surfaces of the battery and either terminal shall be equal to or greater than $5\text{M}\Omega$ at 500_0^{+100}V , applied for up to 60s		NA
5.7	Battery dimensions		P
	Dimensions shall be measured with the measuring equipment specified in 6.8.2.		P
5.8	Leakage and deformation	See Table 3	P
	After the service output has been determined under the specified environmental conditions, the discharge shall be continued in the same way until the closed circuit voltage drops for the first time below 40 % of the nominal voltage of the battery.		P
	The requirements of 4.1.3, 4.2.2 and 4.2.3 shall be met.		P
6	PERFORMANCE – TEST CONDITIONS		P
6.1	Storage and discharge conditions		P
	Storage before discharge testing and the actual discharge test is carried out under well-defined conditions. Unless otherwise specified, the conditions given in Table 3 shall apply.		P
6.2	Commencement of discharge tests after storage		ND
	The period between the completion of storage and the start of a delayed discharge test shall not exceed 14 days.		ND
	During this period the batteries shall be kept at $(20 \pm 2)^\circ\text{C}$ and $(55 \pm 20 / -40) \% \text{RH}$ (except for P-system batteries where the relative humidity shall be $(55 \pm 10) \% \text{RH}$).		ND

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IEC 60086-1			
Clause	Requirement + Test	Result - Remark	Verdict
	At least one day in these conditions shall be allowed for normalization before starting a discharge test after storage at high temperature.		ND
6.3	Discharge test conditions		P
6.3.1	General		P
	In order to test a battery it shall be discharged as specified in IEC 60086-2 or IEC 60086-3 until the voltage on load drops for the first time below the specified end-point.		P
6.3.2	Compliance		P
	When IEC 60086-2 or IEC 60086-3 specify service outputs for more than one discharge test, batteries shall meet all of these requirements in order to comply with this specification.		P
6.4	Load resistance		P
	The value of the resistive load (which includes all parts of the external circuit) shall be as specified in the relevant specification sheet and shall be accurate to $\pm 0,5 \%$.		P
	When formulating new tests, the resistive load shall, whenever possible, be as shown in Table 4 together with their decimal multiples or sub-multiples.		NA
6.5	Time periods		P
	The periods on-discharge and off-discharge shall be as specified in IEC 60086-2.		P
	When formulating new tests, whenever possible, one of the following daily periods should be adopted from Table 5:		NA
	Other cases are specified in IEC 60086-2, if necessary		P
6.6	Test condition tolerances		P
	Unless otherwise specified, the tolerances given in Table 6 shall apply.		P
6.7	Activation of 'P'-system batteries		NA

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IEC 60086-1			
Clause	Requirement + Test	Result - Remark	Verdict
	A period of at least 10 min shall elapse between activation and the commencement of electrical measurement.		NA
6.8	Measuring equipment		P
6.8.1	Voltage measurement		P
	The accuracy of the measuring equipment shall be $\leq 0,25\%$ and the precision shall be $\leq 50\%$ of the value of the last significant digit. The internal resistance of the measuring instrument shall be $\geq 1\text{ M}\Omega$.		P
6.8.2	Mechanical measurement		P
	The accuracy of the measuring equipment shall be $\leq 0,25\%$ and the precision shall be $\leq 50\%$ of the value of the last significant digit.		P
7	SAMPLING AND QUALITY ASSURANCE		P
8	BATTERY PACKAGING		P
	A code of practice for battery packaging, shipment, storage, use and disposal can be found in Annex G		P

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IEC 60086-2			
Clause	Requirement + Test	Result - Remark	Verdict

5	DIMENSIONAL STABILITY		P
	Refer to IEC 60086-1 for dimensional stability		P
6	VALIDITY OF TESTING		NA
	Portable primary batteries shall be subjected to the tests, as required in the IEC 60086 series. Testing remains valid until a design change or requirement revision has been made. Retesting is required when:		NA
	a) a battery specification changes by more than 0,1 g or 20 % mass, whichever is greater, for the cathode, anode or electrolyte;		NA
	b) a battery specification changes that would lead to a failure of any of the tests		NA
	c) there is an addition of new tests or requirements; or		NA
	d) there is a requirement change that would lead to a failure on any of the tests		NA
7	CONSTITUTION OF THE BATTERY SPECIFICATION TABLES		P
	Batteries are categorized into the following groups:		P
	a) Category 1: R1, R03, R6P, R6S, R14P, R14S, R20P, R20S LR8D425, LR1, LR03, LR6, LR14, LR20 FR10G445, FR14505	LR03	P
	b) Category 2: CR14250, CR15H270, CR17345, CR17450, BR17335		NA
	c) Category 3: LR9, CR11108		NA



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IEC 60086-2			
Clause	Requirement + Test	Result - Remark	Verdict
	d) Category 4: PR70, PR41, PR48, PR44, PR1154, LR41, LR55, LR54, LR43, LR44 SR62, SR63, SR65, SR64, SR60, SR67, SR66, SR58, SR68, SR59, SR69, SR41, SR57, SR55, SR48, SR54, SR42, SR43, SR44 CR1025, CR1216, CR1220, CR1225, CR1616, CR1632, CR2012, CR1620, CR2016, CR2025, CR2320, CR2032, CR2330, CR2412, CR2430, CR2477, CR2354, CR3032, CR2450 BR1225, BR2016, BR2320, BR2325, BR3032		NA
	e) Category 5: Other round batteries – Miscellaneous 4LR44 4SR44 8LR932 AR40 5AR40 6AR40 5PR175/172 6PR 225/155		NA

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IEC 60086-2			
Clause	Requirement + Test	Result - Remark	Verdict
	f) Category 6: Non-round batteries – Miscellaneous: 3R12P, 3R12S, 3LR12 4LR61 CR-P2 2CR5 AS4, AS6P, AS6S, AS8, AS10, AS12, PS8S, PS8P, PS10 4R25X, 4LR25X 4R25Y 4R25-2, 4LR25-2 6F22, 6LR61, 6LP3146 6AS4S, 6PS4S, 6PS4P 6AS6P, 6AS6S, 6PS6P, 6PS6S		NA

8	PHYSICAL AND ELECTRICAL SPECIFICATIONS		P
8.1	Category 1 batteries		P
8.1.1	General		P
8.1.2	Specifications: LR1, R1, LR8D425..... :		NA
8.1.3	Specifications: LR03, FR10G445, R03..... :	LR03	P
8.1.4	Specifications: LR6, FR14505, R6P, R6S..... :		NA
8.1.5	Specifications: LR14, R14P, R14S..... :		NA
8.1.6	Specifications: LR20, R20P, R20S..... :		NA
8.2	Category 2 batteries		NA
	Specifications: CR14250, CR15H270, CR17345, CR17450, BR17335..... :		NA
8.3	Category 3 batteries		NA
	Specifications: LR9, CR11108..... :		NA
8.4	Category 4 batteries		NA
8.4.1	General		NA



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IEC 60086-2			
Clause	Requirement + Test	Result - Remark	Verdict
8.4.2	Specifications: PR70, PR41, PR48, PR44, PR1154		NA
8.4.3	Fit acceptance gauge for PR batteries		NA
8.4.4	Specifications: LR41, LR55, LR54, LR43, LR44. :		NA
8.4.5	Specifications: SR62, SR63, SR65, SR64, SR60, SR67, SR66, SR58, SR68, SR59, SR69, SR41, SR57, SR55, SR48, SR54, SR42, SR43, SR44 :		NA
8.4.6	Specifications: CR1025, CR1216, CR1220, CR1225, CR1616, CR2012, CR1620, CR1632, CR2016, CR2025, CR2320, CR2032, CR2330, CR2430, CR2354, CR3032, CR2450, CR2477, BR1225, BR2016, BR2320, BR2325, BR3032..... :		NA
8.5	Category 5 batteries		NA
8.5.1	Specifications: 2CR13252, 4LR44, 4SR44 :		NA
8.5.2	Specifications: 8LR932..... :		NA
8.5.3	Category 5 – Specifications: AR40, 5AR40, 6AR40, 5PR175/172, 6PR225/155		NA
8.6	Category 6 batteries		NA
8.6.1	Specifications: 4LR61..... :		NA
8.6.2	Specifications: CR-P2..... :		NA
8.6.3	Specifications: 2CR5 :		NA
8.6.4	Specifications: 3R12P, 3R12S, 3LR12 :		NA
8.6.5	Specifications: AS4, AS6, AS8, AS10, AS12, PS8S, PS8P, PS10..... :		NA
8.6.6	Specifications: 4R25Y :		NA
8.6.7	Specifications: 4R25X, 4LR25X :		NA
8.6.8	Specifications: 4R25-2, 4LR25-2..... :		NA
8.6.9	Configurations: 6AS4S, 6PS4S, 6PS4P		NA
8.6.10	Specifications: 6F22, 6LR61, 6LP3146..... :		NA
8.6.11	Configurations: Stud for 6F22, 6LR61 6LP3146.... :		NA

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IEC 60086-2			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE 1: Dimension and Open –circuit voltage (OCV)						P
Test program		Standard requirement	Unit	Sample size	Measured data	Results
Battery dimensions	Height	43,5~44,5	mm	32 pcs	43,78~44,31	Pass
	Diameter	9,8~10,5	mm	32 pcs	10,11~10,31	Pass
Open-circuit voltage	OCV	1,5~1,68	V	32 pcs	1,643~1,645	Pass
Supplementary information: None						

TABLE 2: Minimum average duration (MAD)						P
Test program	Standard requirement	Unit	Sample size	Measured data	Average	Result
Portable lighting (5,1Ω, 4min/h, 8h/d, EV: 0,9V)	≥130	min	8pcs	275,9; 275,8; 275,7; 275,6; 276,0; 275,4; 275,8; 275,8	275.7	Pass
Toy (5,1Ω, 1h/d, EV: 0,8V)	≥120	min	8 pcs	292,8; 289,4; 293,0; 294,3; 293,7; 292,7; 292,7; 291,0	292.4	Pass
Digital audio (50mA, 1h/12h, 24h/d, EV: 0,9V)	≥ 12	h	8 pcs	23,47; 23,56; 23,44; 23,64; 23,75; 23,65; 23,66; 23,58	23.59	Pass
Remote control (24Ω, 15s/min, 8h/d, EV: 1,0V)	≥ 14,5	h	8 pcs	22,07; 21,90; 21,95; 22,09; 21,93; 21,94; 22,14; 21,88	21.99	Pass
Supplementary information: Only performed on initial discharge.						

TABLE 3: Leakage and dimension					P
Test program	Standard requirement	Unit	Sample size	Measured data	Result
Portable lighting (5,1Ω, 4min/h, 8h/d, EV: 0,6V)	no leakage no deformation	/	8 pcs	none leakage none deformation	Pass
Toy (5,1Ω, 1h/d, EV: 0,6V)	no leakage no deformation	/	8 pcs	none leakage none deformation	Pass
Digital audio (50mA, 1h/12h, 24h/d, EV: 0,6V)	no leakage no deformation	/	8 pcs	none leakage none deformation	Pass
Remote control (24Ω, 15s/min, 8h/d, EV: 0,6V)	no leakage no deformation	/	8 pcs	none leakage none deformation	Pass
Supplementary information: Only performed on initial discharge.					

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IEC 60086-5			
Clause	Requirement + Test	Result - Remark	Verdict
4	REQUIREMENTS FOR SAFETY		P
4.1	Design		P
4.1.1	General		P
	Batteries shall be so designed that they do not present a safety hazard under conditions of normal (intended) use		P
4.1.2	Venting		P
	All batteries shall incorporate a pressure relief feature or shall be so constructed that they will relieve excessive internal pressure at a value and rate which will preclude explosion		P
	The battery case material and/or its final assembly shall be so designed that, in the event of one or more cells venting, the battery case does not present a hazard in its own right		P
4.2	Quality plan		P
	The manufacturer shall prepare a quality plan defining the procedures for the inspection of materials, components, cells and batteries during the course of manufacture, to be applied to the total process of producing a specific type of battery		P
5	SAMPLING		P
5.1	General		P
	Samples should be drawn from production lots in accordance with accepted statistical methods and shall meet the requirements specified for dimensions and open circuit voltage set forth in IEC 60086-2.		P
5.2	Sampling for type approval		P
	The number of samples drawn for type approval is given in below,		P
	Open circuit voltage (n = 70) Dimensions (n = 70)		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Intended use A Partial use (n = 5) B-1 Transportation-shock (n = 5) B-2 Transportation-vibration (n = 5) C Climatic (n = 5)		P
	Reasonably foreseeable A misuse D Incorrect installation (n = 20) E External short circuit (n = 5) F Overdischarge (n = 20) G Free fall (n = 5)		P
5.3	Validity of testing		NA
	Cells or batteries with aqueous electrolyte shall be subjected to the tests, as required in this document. Testing remains valid until a design change or requirement revision has been made. Retesting is required when:		NA
	a) a battery specification changes by more than 0,1 g or 20 % mass, whichever is greater, for the cathode, anode or electrolyte;		NA
	b) a battery specification change would lead to a failure of any of the tests;		NA
	c) there is an addition of new tests or requirements;		NA
	d) there is a requirement change that would lead to a failure of any of the tests.		NA
6	TESTING AND REQUIREMENTS		P
6.1	General		P
6.1.1	Applicable safety tests		P
	Applicable safety tests are shown in Table 1		P
	The tests described in Tables 2 and 6 are intended to simulate conditions which the battery is likely to encounter during intended use and reasonably foreseeable misuse		P
6.1.2	Cautionary notice		P



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Clause	Requirement + Test	Result - Remark	Verdict
6.1.3	Ambient temperature		P
	Unless otherwise specified, these tests shall be carried out at $(20 \pm 5) ^\circ\text{C}$		P
6.2	Evaluation of test criteria		P
6.2.1	Explosion		P
	An explosion is considered to have occurred when there is an instantaneous release wherein solid matter from any part of the battery is propelled to a distance greater than 25 cm away from the battery.		P
6.2.2	Fire		P
	A fire is considered to have occurred if flames are emitted from a test cell or battery.		P
6.2.3	Leakage		P
	Leakage is considered to have occurred if there is an unplanned escape of electrolyte from a cell or battery.		P
6.2.4	Venting		P
	Venting is considered to have occurred if there is a release of excessive internal pressure from a cell or battery in a manner intended by design to preclude explosion.		
6.3	Intended use		P
6.3.1	Intended use tests and requirements		P
6.3.2	Intended use test procedures		P
6.3.2.1	Test A – Storage after partial use	(See appended table 6.3.2.1)	P
	An undischarged battery is discharged under an application or service output test condition, with the load defined in IEC 60086-2 resulting in the longest test duration until the service life falls by 50 % of the highest minimum average duration (MAD) value, followed by storage at $(45 \pm 2) ^\circ\text{C}$ for 30 days		P
	Results: no leakage, no fire and no explosion.....:	No leakage, no fire and no explosion	P
6.3.2.2	Test B-1 – Transportation-shock	(See appended table 6.3.2.2)	P



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Clause	Requirement + Test	Result - Remark	Verdict
	The shock test shall be carried out under the conditions defined in Table 3 and the sequence in Table 4		P
	Results: no leakage, no fire and no explosion.....:	No leakage, no fire and no explosion	P
6.3.2.3	Test B-2 – Transportation-vibration	(See appended table 6.3.2.3)	P
	The vibration test shall be carried out under the following test conditions and the sequence in Table 5		P
	Results: no leakage, no fire and no explosion.....:	No leakage, no fire and no explosion	P
6.3.2.4	Test C – Climatic-temperature cycling	(See appended table 6.3.2.4)	P
	Temperature cycling procedure (see 1) to 7) and/or Figure 2)		P
	Result: no fire and no explosion.....:	No leakage, no fire and no explosion	P
6.4	Reasonably foreseeable misuse		P
6.4.1	Reasonably foreseeable misuse tests and requirements		P
6.4.2	Reasonably foreseeable misuse test procedures		P
6.4.2.1	Test D – Incorrect installation (four batteries in series)	(See appended table 6.4.2.1)	P
	The circuit were complete for - 24 hours elapsed, or		NA
	- until the battery case temperature has returned to ambient		P
	Results: no fire and no explosion	No fire and no explosion	P
6.4.2.2	Test E – External short circuit	(See appended table 6.4.2.2)	P
	The circuit were complete for - 24 hours elapsed, or		NA
	- until the battery case temperature has returned to ambient		P
	Results: no fire and no explosion	No fire and no explosion	P

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Clause	Requirement + Test	Result - Remark	Verdict
6.4.2.3	Test F – Overdischarge	(See appended table 6.4.2.3)	P
	Results: no fire and no explosion	No fire and no explosion	P
6.4.2.4	Test G – Free fall test	(See appended table 6.4.2.4)	P
	Results: no fire and no explosion	No fire and no explosion	P
9	MARKING AND PACKAGING		P
9.1	General batteries		P
	With the exception of small batteries (see 9.2), each battery shall be marked with the following information		P
	a) designation, IEC or common	LR03	P
	b) expiration of a recommended usage period or year and month or week of manufacture	06-2030	P
	c) polarity of the positive (+) terminal.....	“+”	P
	d) nominal voltage.....	1,5V	P
	e) name or trade mark of the manufacturer or supplier		P
	f) cautionary advice	On the battery	P
9.2	Swallowable button cells		NA
	a) designation, IEC or common		NA
	b) expiration of a recommended usage period or year and month or week of manufacture		NA
	c) polarity of the positive (+) terminal.....		NA
	d) nominal voltage.....		NA
	e) name or trade mark of the manufacturer or supplier		NA
	f) cautionary advice		NA
	g) Caution for ingestion of swallowable batteries, see also 7.1 c) and Annex D		NA
	h) Child resistant packaging		NA

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Clause	Requirement + Test	Result - Remark	Verdict

6.3.2.1	TABLE: Test A – Storage after partial use				P
Model, Sample number	OCV at start of test (Vdc)	Test load	MAD (h)/2	Storage temperature (45 ± 2 °C)	Results
Q70N01	1,632	24Ω	14,5 / 2	45,0	A,B,C
Q70N02	1,634	24Ω	14,5 / 2	45,0	A,B,C
Q70N03	1,631	24Ω	14,5 / 2	45,0	A,B,C
Q70N04	1,635	24Ω	14,5 / 2	45,0	A,B,C
Q70N05	1,638	24Ω	14,5 / 2	45,0	A,B,C
Supplementary information: A- No fire B- No explosion C- No leakage D- Fire E- Explosion F- Leakage G- Bulge H - Others (please explain)					

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Clause	Requirement + Test	Result - Remark	Verdict

6.3.2.2	TABLE: Test B-1 – Transportation-shock			P
Model, Sample number	Ambient (20 ± 5 °C)	OCV at start of test (Vdc)	Results	
Q70N06	21,6	1,625	A,B,C	
Q70N07	21,6	1,632	A,B,C	
Q70N08	21,6	1,625	A,B,C	
Q70N09	21,6	1,633	A,B,C	
Q70N10	21,6	1,642	A,B,C	
Supplementary information: A- No fire B- No explosion C- No leakage D- Fire E- Explosion F- Leakage G- Bulge H - Others (please explain)				

6.3.2.3	TABLE: Test B-2 – Transportation-Vibration			P
Model, Sample number	Ambient (20 ± 5 °C)	OCV at start of test (Vdc)	Results	
Q70N11	21,6	1,639	A,B,C	
Q70N12	21,6	1,632	A,B,C	
Q70N13	21,6	1,631	A,B,C	
Q70N14	21,6	1,634	A,B,C	
Q70N15	21,6	1,637	A,B,C	
Supplementary information: A- No fire B- No explosion C- No leakage D- Fire E- Explosion F- Leakage G- Bulge H - Others (please explain)				

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Clause	Requirement + Test	Result - Remark	Verdict

6.3.2.4	TABLE: Test C – Climatic-temperature cycling		P
Model, Sample number		OCV at start of test (Vdc)	Results
Q70N16		1,633	A,B
Q70N17		1,639	A,B
Q70N18		1,630	A,B
Q70N19		1,631	A,B
Q70N20		1,635	A,B

Supplementary information:

A- No fire
B- No explosion
C- No leakage
D- Fire
E- Explosion
F- Leakage
G- Bulge
H - Others (please explain)

6.4.2.1	TABLE: Test D – Incorrect installation				P
Model, Sample number	Ambient (20 ± 5 °C)	OCV of reversed battery (Vdc)	Resistance of circuitry (mΩ)	Maximum case temperature (°C)	Results
Q70N21	22,2	1,633	84	50,4	A,B
Q70N22	22,2	1,632	84	50,2	A,B
Q70N23	22,2	1,632	84	49,8	A,B
Q70N24	22,2	1,639	84	50,7	A,B
Q70N25	22,2	1,635	84	50,5	A,B

Supplementary information:

A- No fire
B- No explosion
C- No leakage
D- Fire
E- Explosion
F- Leakage
G- Bulge
H - Others (please explain)

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Clause	Requirement + Test	Result - Remark	Verdict

6.4.2.2	TABLE: Test E – External short circuit				P
Model, Sample number	Ambient (20 ± 5 °C)	OCV of reversed cell (Vdc)	Resistance of circuitry (mΩ)	Maximum case temperature (°C)	Results
Q70N26	20,8	1,632	77,49	83,9	A,B
Q70N27	20,8	1,633	76,47	83,0	A,B
Q70N28	20,8	1,632	75,58	85,8	A,B
Q70N29	20,8	1,629	80,91	87,0	A,B
Q70N30	20,8	1,633	82,35	85,2	A,B
Supplementary information: A- No fire B- No explosion C- No leakage D- Fire E- Explosion F- Leakage G- Bulge H - Others (please explain)					

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IEC 60086-5			
Clause	Requirement + Test	Result - Remark	Verdict

6.4.2.3	TABLE: Test F – Overdischarge				P
Model, Sample number	Ambient (20 ± 5 °C)	OCV at start of test (Vdc)	Highest MAD (h)	R1 (Ω)	Results
Q70N31	21,7	1,634	14,5	20,0	A,B
Q70N32	21,7	1,632	14,5	20,0	A,B
Q70N33	21,7	1,629	14,5	20,0	A,B
Q70N34	21,7	1,627	14,5	20,0	A,B
Q70N35	21,7	1,631	14,5	20,0	A,B
Supplementary information: A- No fire B- No explosion C- No leakage D- Fire E- Explosion F- Leakage G- Bulge H - Others (please explain)					

6.4.2.4	TABLE: Test G – Free fall test			P
Model, Sample number	Ambient (20 ± 5 °C)	OCV at start of test (Vdc)	Results	
Q70N36	20,8	1,637	A,B	
Q70N37	20,8	1,634	A,B	
Q70N38	20,8	1,631	A,B	
Q70N39	20,8	1,630	A,B	
Q70N40	20,8	1,633	A,B	
Supplementary information: A- No fire B- No explosion C- No leakage D- Fire0 E- Explosion F- Leakage G- Bulge H - Others (please explain)				

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Clause	Measurement / testing	Equipment	Equipment ID	Range used	Calibration due date
6.3.2.1	Test A – Storage after partial use	Battery load	A7150121SH	DM390	May-06-2026
		Battery load	A7150122SH	DM2200A	May-06-2026
6.3.2.2	Test B-1 – Transportation-shock	Shock Tester	G4000098SH	750~1750m/s ²	May-06-2026
6.3.2.3	Test B-2 – Transportation-vibration	Vibration Test System	G2000163SH	Entire range of frequencies:10 Hz~55Hz, Maximum excursion:1,52 mm	May-08-2026
6.3.2.4	Test C – Climatic-temperature cycling	RH chamber	D1080047SH	EEXTH1000U	Aug-14-2026
6.4.2.1	Test D – Incorrect installation (four batteries in series)	Battery safety Comprehensive tester	G2000161SH	20°C±5°C	Aug-05-2026
6.4.2.2	Test E – External short circuit	Battery safety Comprehensive tester	G2000161SH	20°C±5°C	Aug-05-2026
6.4.2.3	Test F – Overdischarge	Battery safety Comprehensive tester	G2000161SH	20°C±5°C	Aug-05-2026
6.4.2.4	Test G – Free fall test	Falling off explosion-proof test box	G4000097SH	1,0m	Feb-05-2027
4.2.1	Discharge performance	Battery load	A7150121SH	DM390	May-10-2026
		Battery load	A7150122SH	DM2200A	May-10-2026
4.2.2	Dimensional stability	Caliper	B1040165SH	0-150mm	May-10-2026