

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                          |                                                                                    |                                                                                       |                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------|
| <b>Prüfbericht-Nr.:</b><br><i>Test Report No.:</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>CN262BT8 001</b>                                                                                      | <b>Auftrags-Nr.:</b><br><i>Order No.:</i>                                          | 326110802                                                                             | Seite 1 von 24<br><i>Page 1 of 24</i> |
| <b>Kunden-Referenz-Nr.:</b><br><i>Client Reference No.:</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | N/A                                                                                                      | <b>Auftragsdatum:</b><br><i>Order date:</i>                                        | 2025-11-12                                                                            |                                       |
| <b>Auftraggeber:</b><br><i>Client:</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | SUZHOU XINLVZHOU ELECTRONICS CO., LTD.<br>SHANJI ROAD 158,XIANGCHENG DISTRICT,SUZHOU CITY,JIANGSU,CHINA. |                                                                                    |                                                                                       |                                       |
| <b>Prüfgegenstand:</b><br><i>Test item:</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Alkaline Cell                                                                                            |                                                                                    |                                                                                       |                                       |
| <b>Bezeichnung / Typ-Nr.:</b><br><i>Identification / Type No.:</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | LR1130                                                                                                   |                                                                                    |                                                                                       |                                       |
| <b>Auftrags-Inhalt:</b><br><i>Order content:</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | TÜV Rheinland Test Report                                                                                |                                                                                    |                                                                                       |                                       |
| <b>Prüfgrundlage:</b><br><i>Test specification:</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | EN IEC 60086-5: 2021                                                                                     |                                                                                    |                                                                                       |                                       |
| <b>Wareneingangsdatum:</b><br><i>Date of sample receipt:</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2026-01-15                                                                                               | See Attachment 1: Photo documentation                                              |                                                                                       |                                       |
| <b>Prüfmuster-Nr.:</b><br><i>Test sample No.:</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | N/A                                                                                                      |                                                                                    |                                                                                       |                                       |
| <b>Prüfzeitraum:</b><br><i>Testing period:</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2026-01-15 to 2026-03-20                                                                                 |                                                                                    |                                                                                       |                                       |
| <b>Ort der Prüfung:</b><br><i>Place of testing:</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | TÜV Rheinland<br>(Shanghai) Co., Ltd.<br>Kunshan Branch                                                  |                                                                                    |                                                                                       |                                       |
| <b>Prüflaboratorium:</b><br><i>Testing laboratory:</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | See page 4                                                                                               |                                                                                    |                                                                                       |                                       |
| <b>Prüfergebnis*:</b><br><i>Test result*:</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Pass                                                                                                     |                                                                                    |                                                                                       |                                       |
| <b>erstellt von:</b><br><i>created by:</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                       | <b>genehmigt von:</b><br><i>authorized by:</i>                                     |  |                                       |
| <b>Datum:</b> 2026-03-26<br><i>Date:</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Carl Xue                                                                                                 | <b>Datum:</b> 2026-03-26<br><i>Date:</i>                                           | Yuzhang Chen                                                                          |                                       |
| <b>Stellung / Position</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Project Engineer                                                                                         | <b>Stellung / Position</b>                                                         | Authorizer                                                                            |                                       |
| <b>Sonstiges / Other:</b><br>This report does not evidence compliance of the provided sample with the relevant standards but only with the referred tests. This test report documents the findings of examination conducted on the delivered product mentioned above only. This report does not entitle the applicant to carry any safety mark on this or similar products. Further for sales or other application purposes of the tested product, any reference to TÜV Rheinland or a test through TÜV Rheinland is only permissible with prior written consent of TÜV Rheinland |                                                                                                          |                                                                                    |                                                                                       |                                       |
| <b>Zustand des Prüfgegenstandes bei Anlieferung:</b><br><i>Condition of the test item at delivery:</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                          | Prüfmuster vollständig und unbeschädigt<br><i>Test item complete and undamaged</i> |                                                                                       |                                       |
| * Legende: P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet<br>* Legend: P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested                                                                                                                                                                                                                                                                                          |                                                                                                          |                                                                                    |                                                                                       |                                       |
| <b>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</b><br><i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>                                                                                                                        |                                                                                                          |                                                                                    |                                                                                       |                                       |

V05

Prüfbericht-Nr.: CN262BT8 001  
Test report no.:

Seite 2 von 24  
Page 2 of 24

## Anmerkungen Remarks

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | <p>Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüflabors kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben.</p> <p>Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.</p> <p><i>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i></p>                                                                                                                                                                                                                                                                                                                                                                                    |
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| 3 | <p>Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben.</p> <p>Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.</p> <p><i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.</i></p> <p><i>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 4 | <p>Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezüglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019.</p> <p><i>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.</i></p>                                                                                                                                                                                                                       |

**TEST REPORT**  
**IEC 60086-5**  
**Primary Batteries**

**Part 5: Safety of batteries with aqueous electrolyte**

**Report Number** .....

**Date of issue** ..... See cover page

**Total number of pages** ..... See cover page

**Name of Testing Laboratory**

**preparing the Report** ..... See cover page

**Applicant's name** ..... See cover page

**Address** ..... See cover page

**Test specification:**

**Standard** ..... EN IEC 60086-5:2021

**Test procedure** ..... Test report

**Non-standard test method** ..... N/A

**TRF template used** ..... IECEE OD-2020-F1:2021, Ed.1.4

**Test Report Form No.** ..... IEC60086\_5C

**Test Report Form(s) Originator** .... Intertek Semko AB

**Master TRF** ..... Dated 2025-03-25

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**This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.**

**General disclaimer:**

The test results presented in this report relate only to the object tested.

This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

|                                                                                                   |                                        |                |
|---------------------------------------------------------------------------------------------------|----------------------------------------|----------------|
| <b>Test item description..... :</b>                                                               | Alkaline Cell                          |                |
| <b>Trade Mark..... :</b>                                                                          | N/A                                    |                |
| <b>Manufacturer .....</b>                                                                         | Same as applicant of cover page        |                |
| <b>Model/Type reference .....</b>                                                                 | LR1130                                 |                |
| <b>Ratings .....</b>                                                                              | 1.5V                                   |                |
| <b>Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):</b> |                                        |                |
| <input type="checkbox"/>                                                                          | <b>Testing Laboratory:</b>             | See cover page |
| <b>Testing location/ address..... :</b>                                                           |                                        | See cover page |
| <b>Tested by (name, function, signature)..... :</b>                                               |                                        | See cover page |
| <b>Approved by (name, function, signature)... :</b>                                               |                                        | See cover page |
| <input type="checkbox"/>                                                                          | <b>Testing procedure: CTF Stage 1:</b> |                |
| <b>Testing location/ address..... :</b>                                                           |                                        |                |
| <b>Tested by (name, function, signature)..... :</b>                                               |                                        |                |
| <b>Approved by (name, function, signature)... :</b>                                               |                                        |                |
| <input type="checkbox"/>                                                                          | <b>Testing procedure: CTF Stage 2:</b> |                |
| <b>Testing location/ address..... :</b>                                                           |                                        |                |
| <b>Tested by (name + signature) .....</b>                                                         |                                        |                |
| <b>Witnessed by (name, function, signature) . :</b>                                               |                                        |                |
| <b>Approved by (name, function, signature)... :</b>                                               |                                        |                |
| <input type="checkbox"/>                                                                          | <b>Testing procedure: CTF Stage 3:</b> |                |
| <input type="checkbox"/>                                                                          | <b>Testing procedure: CTF Stage 4:</b> |                |
| <b>Testing location/ address..... :</b>                                                           |                                        |                |
| <b>Tested by (name, function, signature)..... :</b>                                               |                                        |                |
| <b>Witnessed by (name, function, signature) . :</b>                                               |                                        |                |
| <b>Approved by (name, function, signature)... :</b>                                               |                                        |                |
| <b>Supervised by (name, function, signature) :</b>                                                |                                        |                |

**List of Attachments (including a total number of pages in each attachment):**

Attachment 1: Photo documentation (1 pages).

**Summary of testing:**
**Tests performed (name of test and test clause):**

Cl. 6.3.2.1 Test A - Storage after partial use;  
 Cl. 6.3.2.2 Test B-1 – Transportation-shock;  
 Cl. 6.3.2.3 Test B-2 – Transportation-vibration;  
 Cl. 6.3.2.4 Test C – Climatic-temperature cycling;  
 Cl. 6.4.2.1 Test D – Incorrect installation(four batteries in series);  
 Cl. 6.4.2.2 Test E – External short circuit;  
 Cl. 6.4.2.3 Test F – Overdischarge;  
 Cl. 6.4.2.4 Test G – Free fall test.  
 Cl. 7.1 C Precautions during handling of batteries (Ingestion gauge)

Tests are made with the number of samples specified in IEC 60086-5: 2021 Figure 1.

**Testing location:**
**Battery Testing Laboratory, Institute of Electrochemical Power Sources of Light Industry**

Building B-4. Shazhou Lake Technological Innovation Park, Zhanjiagang, Jiangsu, China

**Summary of compliance with National Differences (List of countries addressed):**

N/A

☒ **The product fulfils the requirements of EN IEC 60086-5:2021**

**Use of uncertainty of measurement for decisions on conformity (decision rule) :**

☒ No decision rule is specified by the IEC standard, when comparing the measurement result with the applicable limit according to the specification in that standard. The decisions on conformity are made without applying the measurement uncertainty ("simple acceptance" decision rule, previously known as "accuracy method").

☐ Other:... (to be specified, for example when required by the standard or client, or if national accreditation requirements apply)

**Information on uncertainty of measurement:**

The uncertainties of measurement are calculated by the laboratory based on application of criteria given by OD-5014 for test equipment and application of test methods, decision sheets and operational procedures of IECEE.

IEC Guide 115 provides guidance on the application of measurement uncertainty principles and applying the decision rule when reporting test results within IECEE scheme, noting that the reporting of the measurement uncertainty for measurements is not necessary unless required by the test standard or customer.

Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.

**Copy of marking plate:**

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.



Battery Label



**General product information:**

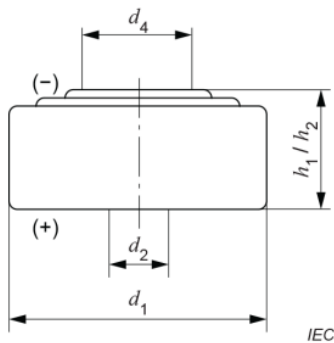
The batteries LR1130 consist of the positive electrode, negative electrode, separator, electrolyte, steel can, current collector and assembled sealing cap. The positive and negative electrodes are housed in the can in the state being separated by the separator, and the assembled sealing cap is fit to the can. The battery will not be sold to customers directly, And no smallest packaging.

The main features of the battery are shown as below:

| Model  | Nominal capacity | Nominal voltage | Maximum discharge current | Discharge cut-off voltage | Dimensions |
|--------|------------------|-----------------|---------------------------|---------------------------|------------|
| LR1130 | --               | 1.5V            | --                        | --                        | See below  |

**Construction:**

| Dimensions  |      | LR41 | LR55  | LR54  | LR43  | LR44  |
|-------------|------|------|-------|-------|-------|-------|
| $h_1 / h_2$ | max. | 3,6  | 2,1   | 3,05  | 4,2   | 5,4   |
|             | min. | 3,3  | 1,85  | 2,75  | 3,8   | 5,0   |
| $d_1$       | max. | 7,9  | 11,6  | 11,6  | 11,6  | 11,6  |
|             | min. | 7,55 | 11,25 | 11,25 | 11,25 | 11,25 |
| $d_2$       | min. | 3,8  | 3,8   | 3,8   | 3,8   | 3,8   |
| $d_4$       | min. | 3,0  | 3,8   | 3,8   | 3,8   | 3,8   |



| IEC 60086-5 |                                                                                                                                                                                                                                                     |                                                   |          |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|----------|
| Clause      | Requirement + Test                                                                                                                                                                                                                                  | Result - Remark                                   | Verdict  |
| <b>4</b>    | <b>REQUIREMENTS FOR SAFETY</b>                                                                                                                                                                                                                      |                                                   | <b>P</b> |
| <b>4.1</b>  | <b>Design</b>                                                                                                                                                                                                                                       |                                                   | <b>P</b> |
| 4.1.1       | General                                                                                                                                                                                                                                             |                                                   | <b>P</b> |
|             | Batteries shall be so designed that they do not present a safety hazard under conditions of normal (intended) use                                                                                                                                   |                                                   | <b>P</b> |
| 4.1.2       | Venting                                                                                                                                                                                                                                             |                                                   | <b>P</b> |
|             | 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                                                           | Pressure relieving mechanism exists.              | <b>P</b> |
|             | 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                                                               |                                                   | <b>P</b> |
| <b>4.2</b>  | <b>Quality plan</b>                                                                                                                                                                                                                                 |                                                   | <b>P</b> |
|             | 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 | Complied.<br>ISO 9001: 2015 certificate provided. | <b>P</b> |
| <b>5</b>    | <b>SAMPLING</b>                                                                                                                                                                                                                                     |                                                   | <b>P</b> |
| <b>5.1</b>  | <b>General</b>                                                                                                                                                                                                                                      |                                                   | <b>P</b> |
|             | 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.                                            |                                                   | <b>P</b> |
| <b>5.2</b>  | <b>Sampling for type approval</b>                                                                                                                                                                                                                   |                                                   | <b>P</b> |
|             | The number of samples drawn for type approval is given in below,                                                                                                                                                                                    | Complied.                                         | <b>P</b> |
|             | Open circuit voltage (n = 70)<br>Dimensions (n = 70)                                                                                                                                                                                                | n = 70                                            | <b>P</b> |
|             | Intended use<br>A Partial use (n = 5)<br>B-1 Transportation-shock (n = 5)<br>B-2 Transportation-vibration (n = 5)<br>C Climatic (n = 5)                                                                                                             |                                                   | <b>P</b> |

| IEC 60086-5 |                                                                                                                                                                                                                           |                                          |          |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|----------|
| Clause      | Requirement + Test                                                                                                                                                                                                        | Result - Remark                          | Verdict  |
|             | Reasonably foreseeable A misuse<br>D Incorrect installation (n = 20)<br>E External short circuit (n = 5)<br>F Overdischarge (n = 20)<br>G Free fall (n = 5)                                                               |                                          | P        |
| <b>5.3</b>  | <b>Validity of testing</b>                                                                                                                                                                                                | First test.                              | P        |
|             | 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: |                                          | P        |
|             | a) a battery specification changes by more than 0,1 g or 20 % mass, whichever is greater, for the cathode, anode or electrolyte;                                                                                          |                                          | P        |
|             | b) a battery specification change would lead to a failure of any of the tests;                                                                                                                                            |                                          | P        |
|             | c) there is an addition of new tests or requirements;                                                                                                                                                                     |                                          | P        |
|             | d) there is a requirement change that would lead to a failure of any of the tests.                                                                                                                                        |                                          | P        |
| <b>6</b>    | <b>TESTING AND REQUIREMENTS</b>                                                                                                                                                                                           |                                          | <b>P</b> |
| <b>6.1</b>  | <b>General</b>                                                                                                                                                                                                            | Complied.                                | P        |
| 6.1.1       | Applicable safety tests                                                                                                                                                                                                   | (See table 1 in the standard).           | 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        |
| 6.1.3       | Ambient temperature                                                                                                                                                                                                       |                                          | P        |
|             | Unless otherwise specified, these tests shall be carried out at $(20 \pm 5) ^\circ\text{C}$                                                                                                                               | $20^\circ\text{C} \pm 5^\circ\text{C}$ . | P        |
| <b>6.2</b>  | <b>Evaluation of test criteria</b>                                                                                                                                                                                        |                                          | 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        |

| IEC 60086-5 |                                                                                                                                                                                                                                                                                                                                   |                                                                        |         |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------|
| Clause      | Requirement + Test                                                                                                                                                                                                                                                                                                                | Result - Remark                                                        | Verdict |
|             | 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.                                                                                                                                                          |                                                                        | P       |
| <b>6.3</b>  | <b>Intended use</b>                                                                                                                                                                                                                                                                                                               | See tests below.                                                       | P       |
| 6.3.1       | Intended use tests and requirements                                                                                                                                                                                                                                                                                               | (See table 2 in the standard).                                         | P       |
| 6.3.2       | Intended use test procedures                                                                                                                                                                                                                                                                                                      |                                                                        | P       |
| 6.3.2.1     | Test A – Storage after partial use                                                                                                                                                                                                                                                                                                |                                                                        | 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 | Tested complied.<br>LR1130:<br>Resistive Load=15K $\Omega$<br>MAD=350h | P       |
|             | Results: no leakage, no fire and no explosion..... :                                                                                                                                                                                                                                                                              | (See appended table 6.3.2.1)                                           | P       |
| 6.3.2.2     | Test B-1 – Transportation-shock                                                                                                                                                                                                                                                                                                   |                                                                        | P       |
|             | The shock test shall be carried out under the conditions defined in Table 3 and the sequence in Table 4                                                                                                                                                                                                                           | Tested complied.                                                       | P       |
|             | Results: no leakage, no fire and no explosion..... :                                                                                                                                                                                                                                                                              | (See appended table 6.3.2.2)                                           | P       |
| 6.3.2.3     | Test B-2 – Transportation-vibration                                                                                                                                                                                                                                                                                               |                                                                        | P       |
|             | The vibration test shall be carried out under the following test conditions and the sequence in Table 5                                                                                                                                                                                                                           | Tested complied.                                                       | P       |
|             | Results: no leakage, no fire and no explosion..... :                                                                                                                                                                                                                                                                              | (See appended table 6.3.2.3)                                           | P       |
| 6.3.2.4     | Test C – Climatic-temperature cycling                                                                                                                                                                                                                                                                                             |                                                                        | P       |
|             | Temperature cycling procedure (see 1) to 7) and/or Figure 2)                                                                                                                                                                                                                                                                      | Tested complied.                                                       | P       |
|             | Result: no fire and no explosion..... :                                                                                                                                                                                                                                                                                           | (See appended table 6.3.2.4)                                           | P       |
| <b>6.4</b>  | <b>Reasonably foreseeable misuse</b>                                                                                                                                                                                                                                                                                              |                                                                        | P       |
| 6.4.1       | Reasonably foreseeable misuse tests and requirements                                                                                                                                                                                                                                                                              | (See table 6 in the standard).                                         | P       |
| 6.4.2       | Reasonably foreseeable misuse test procedures                                                                                                                                                                                                                                                                                     |                                                                        | P       |
| 6.4.2.1     | Test D – Incorrect installation (four batteries in series)                                                                                                                                                                                                                                                                        |                                                                        | N/A     |
|             | The circuit were complete for<br>- 24 hours elapsed, or                                                                                                                                                                                                                                                                           |                                                                        | N/A     |

| IEC 60086-5 |                                                                                                                                                                                                                   |                                                                        |         |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------|
| Clause      | Requirement + Test                                                                                                                                                                                                | Result - Remark                                                        | Verdict |
|             | - until the battery case temperature has returned to ambient                                                                                                                                                      |                                                                        | N/A     |
|             | Results: no fire and no explosion..... :                                                                                                                                                                          | (See appended table 6.4.2.1)                                           | N/A     |
| 6.4.2.2     | Test E – External short circuit                                                                                                                                                                                   | Tested complied.                                                       | P       |
|             | The circuit were complete for<br>- 24 hours elapsed, or                                                                                                                                                           |                                                                        | N/A     |
|             | - until the battery case temperature has returned to ambient                                                                                                                                                      |                                                                        | P       |
|             | Results: no fire and no explosion..... :                                                                                                                                                                          | (See appended table 6.4.2.2)                                           | P       |
| 6.4.2.3     | Test F – Overdischarge                                                                                                                                                                                            |                                                                        | N/A     |
|             | Results: no fire and no explosion..... :                                                                                                                                                                          | (See appended table 6.4.2.3)                                           | N/A     |
| 6.4.2.4     | Test G – Free fall test                                                                                                                                                                                           | Tested complied.                                                       | P       |
|             | Results: no fire and no explosion..... :                                                                                                                                                                          | (See appended table 6.4.2.4)                                           | P       |
| <b>7</b>    | <b>INFORMATION FOR SAFETY</b>                                                                                                                                                                                     |                                                                        | P       |
| <b>7.1</b>  | <b>Precautions during handling of batteries</b>                                                                                                                                                                   |                                                                        | P       |
|             | When used correctly, primary batteries with aqueous electrolyte provide a safe and dependable source of power. However, battery misuse or abuse may result in leakage, or in extreme cases, fire and/or explosion | Safety instruction marked on label and also provided in specification. | P       |
|             | a) Always insert batteries correctly with regard to the polarities (+ and –) marked on the battery and the equipment                                                                                              | The polarities (+ and –) marked on the battery, also see page 6.       | P       |
|             | b) Do not short-circuit batteries                                                                                                                                                                                 |                                                                        | P       |
|             | c) Keep batteries out of the reach of children                                                                                                                                                                    |                                                                        | P       |
|             | d) Do not charge batteries                                                                                                                                                                                        |                                                                        | P       |
|             | e) Do not force discharge batteries                                                                                                                                                                               |                                                                        | P       |
|             | f) Do not mix old and new batteries or batteries of different types or brands                                                                                                                                     |                                                                        | P       |
|             | g) Exhausted batteries should be immediately removed from equipment and properly disposed of                                                                                                                      |                                                                        | P       |
|             | h) Do not expose batteries to heat.                                                                                                                                                                               |                                                                        | P       |
|             | i) Do not weld or solder directly to batteries                                                                                                                                                                    |                                                                        | P       |
|             | j) Do not dismantle batteries                                                                                                                                                                                     |                                                                        | P       |
|             | k) Do not deform batteries                                                                                                                                                                                        |                                                                        | P       |
|             | l) Do not dispose of batteries in fire                                                                                                                                                                            |                                                                        | P       |
|             | m) Do not allow children to replace batteries without adult supervision                                                                                                                                           |                                                                        | P       |
|             | n) Do not encapsulate and/or modify batteries                                                                                                                                                                     |                                                                        | P       |

| IEC 60086-5 |                                                                                                                                                                                              |                                                                        |         |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------|
| Clause      | Requirement + Test                                                                                                                                                                           | Result - Remark                                                        | Verdict |
|             | o) Store unused batteries in their original packaging away from metal objects. If already unpacked, do not mix or jumble batteries                                                           |                                                                        | P       |
|             | p) Remove batteries from equipment if it is not to be used for an extended period of time unless it is for emergency purposes                                                                |                                                                        | P       |
| <b>7.2</b>  | <b>Packaging</b>                                                                                                                                                                             |                                                                        | P       |
|             | The packaging shall be adequate to avoid mechanical damage during transport, handling and stacking                                                                                           | Information for packaging provided in specification.                   | P       |
|             | The materials and packaging design shall be chosen so as to prevent the development of unintentional electrical contact, corrosion of the terminals and some protection from the environment |                                                                        | P       |
| <b>7.3</b>  | <b>Handling of battery cartons</b>                                                                                                                                                           |                                                                        | P       |
|             | Battery cartons should be handled with care. Rough handling might result in battery damage. This can cause leakage, explosion, or fire.                                                      | Information for handling of battery cartons provided in specification. | P       |
| <b>7.4</b>  | <b>Display and storage</b>                                                                                                                                                                   | Display and storage recommendations provided in the specification.     | P       |
|             | a) Batteries shall be stored in well-ventilated, dry and cool conditions                                                                                                                     |                                                                        | P       |
|             | b) Battery cartons should not be piled up in several layers (or should not exceed a specified height)                                                                                        |                                                                        | P       |
|             | c) When batteries are stored in warehouses or displayed in retail stores, they should not be exposed to direct sun rays for a long time or placed in areas where they get wet by rain        |                                                                        | P       |
|             | d) Do not mix unpacked batteries so as to avoid mechanical damage and/or short-circuit among each other                                                                                      |                                                                        | P       |
|             | e) See Annex A for additional details                                                                                                                                                        |                                                                        | P       |
| <b>7.5</b>  | <b>Transportation</b>                                                                                                                                                                        | Safety information provided in specification.                          | P       |
|             | When loaded for transportation, battery packages should be so arranged to minimise the risk of falling                                                                                       |                                                                        | P       |
| <b>7.6</b>  | <b>Disposal</b>                                                                                                                                                                              | Disposal recommendations provided in the specification.                | P       |
|             | a) Do not dismantle batteries                                                                                                                                                                |                                                                        | P       |
|             | b) Do not dispose of batteries in fire except under conditions of controlled incineration                                                                                                    |                                                                        | P       |

| IEC 60086-5 |                                                                                                                                  |                                         |         |
|-------------|----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|---------|
| Clause      | Requirement + Test                                                                                                               | Result - Remark                         | Verdict |
|             | c) Primary batteries may be disposed of via the communal refuse arrangements, provided that no local rules to the contrary exist |                                         | P       |
|             | d) The provision for the collection of used batteries                                                                            |                                         | P       |
|             | Following should be considered:                                                                                                  |                                         | P       |
|             | • Store collected batteries in a non-conductive container.                                                                       |                                         | P       |
|             | • Store collected batteries in a well-ventilated area.                                                                           |                                         | P       |
|             | • Do not mix collected batteries with other materials.                                                                           |                                         | P       |
|             | • Consider protecting used battery terminals, particularly those batteries with high voltage                                     |                                         | P       |
|             | • Failure to observe these recommendations may result in leakage, fire, and/or explosion.                                        |                                         | P       |
| <b>8</b>    | <b>INSTRUCTIONS FOR USE</b>                                                                                                      | Instructions provided in specification. | P       |
|             | a) Always select the correct size and grade of battery most suitable for the intended use                                        |                                         | P       |
|             | Information provided with the equipment to assist correct battery selection should be retained for reference                     |                                         | P       |
|             | b) Replace all batteries of a set at the same time                                                                               |                                         | P       |
|             | c) Clean the battery contacts and also those of the equipment prior to battery installation                                      |                                         | P       |
|             | d) Ensure that the batteries are installed correctly with regard to polarity (+ and –)                                           |                                         | P       |
|             | e) Remove batteries from equipment which is not to be used for an extended period of time                                        |                                         | P       |
|             | f) Remove exhausted batteries promptly                                                                                           |                                         | P       |
| <b>9</b>    | <b>MARKING AND PACKAGING</b>                                                                                                     |                                         | N/A     |
| <b>9.1</b>  | <b>General batteries</b>                                                                                                         |                                         | N/A     |
|             | With the exception of small batteries (see 9.2), each battery shall be marked with the following information                     |                                         | N/A     |
|             | a) designation, IEC or common .....                                                                                              |                                         | N/A     |
|             | b) expiration of a recommended usage period or year and month or week of manufacture .....                                       |                                         | N/A     |
|             | c) polarity of the positive (+) terminal .....                                                                                   |                                         | N/A     |
|             | d) nominal voltage .....                                                                                                         |                                         | N/A     |
|             | e) name or trade mark of the manufacturer or supplier .....                                                                      |                                         | N/A     |
|             | f) cautionary advice .....                                                                                                       |                                         | N/A     |

| IEC 60086-5    |                                                                                                                                                                                                                                                |                   |         |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------|
| Clause         | Requirement + Test                                                                                                                                                                                                                             | Result - Remark   | Verdict |
| <b>9.2</b>     | <b>Swallowable button cells</b>                                                                                                                                                                                                                | Not button cells. | N/A     |
|                | a) designation, IEC or common .....                                                                                                                                                                                                            |                   | N/A     |
|                | b) expiration of a recommended usage period or year and month or week of manufacture .....                                                                                                                                                     |                   | N/A     |
|                | c) polarity of the positive (+) terminal .....                                                                                                                                                                                                 |                   | N/A     |
|                | d) nominal voltage .....                                                                                                                                                                                                                       |                   | N/A     |
|                | e) name or trade mark of the manufacturer or supplier .....                                                                                                                                                                                    |                   | N/A     |
|                | f) cautionary advice .....                                                                                                                                                                                                                     |                   | N/A     |
|                | g) Caution for ingestion of swallowable batteries, see also 7.1 c) and Annex D                                                                                                                                                                 |                   | N/A     |
|                | h) Child resistant packaging                                                                                                                                                                                                                   |                   | N/A     |
| <b>9.3</b>     | <b>Safety pictograms</b>                                                                                                                                                                                                                       |                   | N/A     |
|                | Safety pictograms that could be considered for use as an alternative to written cautionary advice are provided in Annex C.                                                                                                                     |                   | N/A     |
| <b>Annex A</b> | <b>Additional information on display and storage</b>                                                                                                                                                                                           |                   | N/A     |
|                | It takes the form of advice to battery manufacturers, distributors, users, and equipment designers                                                                                                                                             |                   | N/A     |
|                | Storage and stock rotation                                                                                                                                                                                                                     |                   | N/A     |
| <b>Annex B</b> | <b>Battery compartment design guidelines</b>                                                                                                                                                                                                   |                   | N/A     |
| <b>B.1</b>     | <b>Background</b>                                                                                                                                                                                                                              |                   | N/A     |
| B.1.1          | General                                                                                                                                                                                                                                        |                   | N/A     |
| B.1.2          | Battery failures resulting from poor battery compartment design                                                                                                                                                                                |                   | N/A     |
|                | Poor battery compartment design may lead to reversed battery installation or to short circuiting of the batteries                                                                                                                              |                   | N/A     |
| B.1.3          | Potential hazards resulting from battery reversal                                                                                                                                                                                              |                   | N/A     |
| B.1.4          | Potential hazards resulting from a short circuit                                                                                                                                                                                               |                   | N/A     |
| <b>B.2</b>     | <b>General guidance for appliance design</b>                                                                                                                                                                                                   |                   | N/A     |
| B.2.1          | Key battery factors to be first considered                                                                                                                                                                                                     |                   | N/A     |
| B.2.2          | Other important factors to consider                                                                                                                                                                                                            |                   | N/A     |
| <b>B.3</b>     | <b>Specific measures against reversed installation</b>                                                                                                                                                                                         |                   | N/A     |
| B.3.1          | General                                                                                                                                                                                                                                        |                   | N/A     |
|                | To overcome the problems associated with the reversed placement of a battery, consideration should be given at the design stage to ensure that batteries cannot be installed incorrectly or, if so installed, will not make electrical contact |                   | N/A     |

| IEC 60086-5    |                                                                                                                                    |                 |         |
|----------------|------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------|
| Clause         | Requirement + Test                                                                                                                 | Result - Remark | Verdict |
| B.3.2          | Design of the positive contact                                                                                                     |                 | N/A     |
| B.3.3          | Design of the negative contact                                                                                                     |                 | N/A     |
| B.3.4          | Design with respect to battery orientation                                                                                         |                 | N/A     |
| B.3.5          | Dimensional considerations                                                                                                         |                 | N/A     |
| <b>B.4</b>     | <b>Specific measures to prevent short-circuiting of batteries</b>                                                                  |                 | N/A     |
| B.4.1          | Measures to prevent short-circuiting due to battery jacket damage                                                                  |                 | N/A     |
| B.4.2          | Measures to prevent external short-circuit of a battery caused when coiled spring contacts are employed for battery connection     |                 | N/A     |
| <b>B.5</b>     | <b>Special considerations regarding recessed negative contacts</b>                                                                 |                 | N/A     |
| <b>B.6</b>     | <b>Waterproof and non-vented devices</b>                                                                                           |                 | N/A     |
| <b>B.7</b>     | <b>Other design considerations</b>                                                                                                 |                 | N/A     |
| <b>Annex C</b> | <b>Safety pictograms</b>                                                                                                           |                 | N/A     |
| <b>C.1</b>     | <b>General</b>                                                                                                                     |                 | N/A     |
|                | Cautionary advice to fulfil the marking requirements in this standard has, on a historical basis, been in the form of written text |                 | N/A     |
| <b>C.2</b>     | <b>Pictograms</b>                                                                                                                  |                 | N/A     |
|                | The pictogram recommendations and cautionary advices are given in Table C.1                                                        |                 | N/A     |
|                |  DO NOT CHARGE                                  |                 | N/A     |
|                |  DO NOT DEFORM / DAMAGE                         |                 | N/A     |
|                |  DO NOT DISPOSE OF IN FIRE                      |                 | N/A     |
|                |  DO NOT INSERT INCORRECTLY                      |                 | N/A     |
|                |  KEEP OUT OF REACH OF CHILDREN                  |                 | N/A     |

| IEC 60086-5    |                                                                                                                                                                                                                                                                                                                                                         |                 |         |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------|
| Clause         | Requirement + Test                                                                                                                                                                                                                                                                                                                                      | Result - Remark | Verdict |
|                |  DO NOT MIX DIFFERENT TYPES OR BRANDS                                                                                                                                                                                                                                  |                 | N/A     |
|                |  DO NOT MIX NEW AND USED                                                                                                                                                                                                                                               |                 | N/A     |
|                |  DO NOT OPEN / DISMANTLE                                                                                                                                                                                                                                               |                 | N/A     |
|                |  DO NOT SHORT CIRCUIT                                                                                                                                                                                                                                                  |                 | N/A     |
|                |  INSERT CORRECTLY                                                                                                                                                                                                                                                      |                 | N/A     |
| <b>C.3</b>     | <b>Recommendations for use</b>                                                                                                                                                                                                                                                                                                                          |                 | N/A     |
|                | The following instructions are provided for use of the pictograms                                                                                                                                                                                                                                                                                       |                 | N/A     |
|                | a) Pictograms shall be clearly legible                                                                                                                                                                                                                                                                                                                  |                 | N/A     |
|                | b) Whilst colours can be used, they should not detract from the information displayed. If colours are used, the background of pictograms E and J should be blue and the circle and diagonal bar of the other pictograms should be red.                                                                                                                  |                 | N/A     |
|                | c) Not all of the pictograms need to be used together for a particular type or brand of battery.<br>In particular, pictogram D and J are meant as alternatives for a similar purpose                                                                                                                                                                    |                 | N/A     |
| <b>Annex D</b> | <b>Use of the KEEP OUT OF REACH OF CHILDREN safety sign</b>                                                                                                                                                                                                                                                                                             |                 | N/A     |
| <b>D.1</b>     | <b>General</b>                                                                                                                                                                                                                                                                                                                                          |                 | N/A     |
| <b>D.2</b>     | <b>Safety sign</b>                                                                                                                                                                                                                                                                                                                                      |                 | N/A     |
|                | When a safety sign is used to convey the message that these swallowable button cells (i.e. can fit in the ingestion gauge, see Figure 7) should be kept out of the reach of children, the following best practices apply. The safety sign recommendation and cautionary advice for use on battery packaging are given in Table C.1, safety pictogram E. |                 | N/A     |
| <b>D.3</b>     | <b>Best practices for marking the packaging</b>                                                                                                                                                                                                                                                                                                         |                 | N/A     |

| IEC 60086-5    |                                                                                                                                                                                                                                                                                                               |                 |         |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------|
| Clause         | Requirement + Test                                                                                                                                                                                                                                                                                            | Result - Remark | Verdict |
|                | Packaging of swallowable button cells (i.e. can fit in the ingestion gauge, see Figure 7) should be marked with the safety pictogram E of Table C.1 to alert the purchaser of the increased risk of such cells.                                                                                               |                 | N/A     |
|                | a) Refer to Table 7 for marking requirements on packaging.                                                                                                                                                                                                                                                    |                 | N/A     |
|                | b) The safety sign should be on contrasting background. The background should cover at least 50 % of the area of the pictogram.                                                                                                                                                                               |                 | N/A     |
|                | c) The size of the safety sign should be 6 mm in diameter or larger.                                                                                                                                                                                                                                          |                 | N/A     |
|                | d) If the text "KEEP OUT OF REACH OF CHILDREN" is used, it should contrast with the background colour on which it is printed.                                                                                                                                                                                 |                 | N/A     |
| <b>Annex E</b> | <b>Child resistant packaging</b>                                                                                                                                                                                                                                                                              |                 | N/A     |
| <b>E.1</b>     | <b>General</b>                                                                                                                                                                                                                                                                                                |                 | N/A     |
| <b>E.1.1</b>   | <b>General</b>                                                                                                                                                                                                                                                                                                |                 | N/A     |
| <b>E.1.2</b>   | <b>Applicability</b>                                                                                                                                                                                                                                                                                          |                 | N/A     |
| <b>E.1.3</b>   | <b>Packaging design</b>                                                                                                                                                                                                                                                                                       |                 | N/A     |
| <b>E.1.3.1</b> | <b>Single cell packaging</b>                                                                                                                                                                                                                                                                                  |                 | N/A     |
|                | The packaging for button cells should meet one of the following:                                                                                                                                                                                                                                              |                 | N/A     |
|                | a) packaging strength as described in E.1.3.3                                                                                                                                                                                                                                                                 |                 | N/A     |
|                | b) packaging requirements based on local legislation or standardization [8], [9], [10], if applicable.                                                                                                                                                                                                        |                 | N/A     |
| <b>E.1.3.2</b> | <b>Multi-cell packaging</b>                                                                                                                                                                                                                                                                                   |                 | N/A     |
|                | Each cell containment in a multi-cell packaging should meet the above requirements even when another cell containment is removed from the packaging.                                                                                                                                                          |                 | N/A     |
| <b>E.1.3.3</b> | <b>Packaging strength</b>                                                                                                                                                                                                                                                                                     |                 | N/A     |
|                | The packaging strength should be such that the packaging passes the tests described in Clause E.2.                                                                                                                                                                                                            |                 | N/A     |
| <b>E.2</b>     | <b>Packaging tests</b>                                                                                                                                                                                                                                                                                        |                 | N/A     |
| <b>E.2.1</b>   | <b>General</b>                                                                                                                                                                                                                                                                                                |                 | N/A     |
|                | The following test methods were developed based on the analysis of the behaviour of children in a test where they were required to try and open button cell packaging within a limited time. The tests should be conducted by an instructed person or, alternatively, if necessary, using suitable equipment. |                 | N/A     |
| <b>E.2.2</b>   | <b>Test items</b>                                                                                                                                                                                                                                                                                             |                 | N/A     |

| IEC 60086-5  |                                                                                                                                                                                                                                                                                                |                 |         |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------|
| Clause       | Requirement + Test                                                                                                                                                                                                                                                                             | Result - Remark | Verdict |
|              | a) Bending test                                                                                                                                                                                                                                                                                |                 | N/A     |
|              | b) Torsion test                                                                                                                                                                                                                                                                                |                 | N/A     |
|              | c) Tearing test                                                                                                                                                                                                                                                                                |                 | N/A     |
|              | d) Pushing test                                                                                                                                                                                                                                                                                |                 | N/A     |
| <b>E.2.3</b> | <b>Test procedure</b>                                                                                                                                                                                                                                                                          |                 | N/A     |
|              | The test procedure is conducted with ten sample packagings. Each sample is subjected to a series of tests in the order and frequency outlined in Table E.1.                                                                                                                                    |                 | N/A     |
| <b>E.2.4</b> | <b>Criteria</b>                                                                                                                                                                                                                                                                                |                 | N/A     |
|              | Each test sample should meet the following criteria.                                                                                                                                                                                                                                           |                 | N/A     |
|              | a) each cell should be kept in its packaging until the end of the test series                                                                                                                                                                                                                  |                 | N/A     |
|              | b) in order to prevent a child from pulling the cell out from its compartment, the packaging should not open too wide. The maximum allowable size of an opening in the packaging is 6 mm diameter for a round hole and 10 mm length for a slit. See Figure E.5 for maximum packaging openings. |                 | N/A     |

| IEC 60086-5                                                                      |                                                  |                                    |         |                                     |          |
|----------------------------------------------------------------------------------|--------------------------------------------------|------------------------------------|---------|-------------------------------------|----------|
| Clause                                                                           | Requirement + Test                               |                                    |         | Result - Remark                     | Verdict  |
| <b>6.3.2.1</b>                                                                   | <b>TABLE: Test A – Storage after partial use</b> |                                    |         |                                     | <b>P</b> |
| Model, Sample number                                                             | OCV at start of test (Vdc)                       | Lowest resistive load ( $\Omega$ ) | MAD (h) | Storage temperature (45 $\pm$ 2 °C) | Results  |
| #1                                                                               | 1.640                                            | 15                                 | 350     | 45                                  | P        |
| #2                                                                               | 1.644                                            | 15                                 | 350     | 45                                  | P        |
| #3                                                                               | 1.642                                            | 15                                 | 350     | 45                                  | P        |
| #4                                                                               | 1.644                                            | 15                                 | 350     | 45                                  | P        |
| #5                                                                               | 1.642                                            | 15                                 | 350     | 45                                  | P        |
| <b>Supplementary information:</b><br>- No fire<br>- No explosion<br>- No leakage |                                                  |                                    |         |                                     |          |

|                                                                           |                                        |                            |         |   |
|---------------------------------------------------------------------------|----------------------------------------|----------------------------|---------|---|
| 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 |   |
| #6                                                                        | 22.4                                   | 1.638                      | P       |   |
| #7                                                                        | 22.4                                   | 1.647                      | P       |   |
| #8                                                                        | 22.4                                   | 1.642                      | P       |   |
| #9                                                                        | 22.4                                   | 1.644                      | P       |   |
| #10                                                                       | 22.4                                   | 1.645                      | P       |   |
| Supplementary information:<br>- No fire<br>- No explosion<br>- No leakage |                                        |                            |         |   |

|                            |                                            |                            |         |   |
|----------------------------|--------------------------------------------|----------------------------|---------|---|
| 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 |   |
| #11                        | 23.5                                       | 1.647                      | P       |   |
| #12                        | 23.5                                       | 1.643                      | P       |   |
| #13                        | 23.5                                       | 1.645                      | P       |   |
| #14                        | 23.5                                       | 1.640                      | P       |   |
| #15                        | 23.5                                       | 1.642                      | P       |   |
| Supplementary information: |                                            |                            |         |   |
| - No fire                  |                                            |                            |         |   |
| - No explosion             |                                            |                            |         |   |
| - No leakage               |                                            |                            |         |   |

| IEC 60086-5                                                      |                                                     |                            |          |
|------------------------------------------------------------------|-----------------------------------------------------|----------------------------|----------|
| Clause                                                           | Requirement + Test                                  | Result - Remark            | Verdict  |
| <b>6.3.2.4</b>                                                   | <b>TABLE: Test C – Climatic-temperature cycling</b> |                            | <b>P</b> |
| Model, Sample number                                             |                                                     | OCV at start of test (Vdc) | Results  |
| #16                                                              |                                                     | 1.646                      | P        |
| #17                                                              |                                                     | 1.642                      | P        |
| #18                                                              |                                                     | 1.639                      | P        |
| #19                                                              |                                                     | 1.641                      | P        |
| #20                                                              |                                                     | 1.644                      | P        |
| <b>Supplementary information:</b><br>- No fire<br>- No explosion |                                                     |                            |          |

| 6.4.2.1                    | TABLE: Test D – Incorrect installation |                               |                             |                               |         | N/A |
|----------------------------|----------------------------------------|-------------------------------|-----------------------------|-------------------------------|---------|-----|
| Model, Sample number       | Ambient (20 ± 5 °C)                    | OCV of reversed battery (Vdc) | Resistance of circuitry (Ω) | Maximum case temperature (°C) | Results |     |
|                            |                                        |                               |                             |                               | N/A     |     |
|                            |                                        |                               |                             |                               | N/A     |     |
|                            |                                        |                               |                             |                               | N/A     |     |
|                            |                                        |                               |                             |                               | N/A     |     |
|                            |                                        |                               |                             |                               | N/A     |     |
| Supplementary information: |                                        |                               |                             |                               |         |     |
| - No fire                  |                                        |                               |                             |                               |         |     |
| - No explosion             |                                        |                               |                             |                               |         |     |

| 6.4.2.2                    | TABLE: Test E – External short circuit |                            |                             |                               |         | N/A |
|----------------------------|----------------------------------------|----------------------------|-----------------------------|-------------------------------|---------|-----|
| Model, Sample number       | Ambient (20 ± 5 °C)                    | OCV of reversed cell (Vdc) | Resistance of circuitry (Ω) | Maximum case temperature (°C) | Results |     |
| #21                        | 24.3                                   | 1.645                      | 0.005                       | 54.9                          | P       |     |
| #22                        | 24.3                                   | 1.641                      | 0.005                       | 57.2                          | P       |     |
| #23                        | 24.3                                   | 1.641                      | 0.005                       | 47.3                          | P       |     |
| #24                        | 24.3                                   | 1.646                      | 0.005                       | 64.8                          | P       |     |
| #25                        | 24.3                                   | 1.644                      | 0.005                       | 49.5                          | P       |     |
| Supplementary information: |                                        |                            |                             |                               |         |     |
| - No fire                  |                                        |                            |                             |                               |         |     |
| - No explosion             |                                        |                            |                             |                               |         |     |

| IEC 60086-5                                                      |                                      |                            |                 |                 |         |
|------------------------------------------------------------------|--------------------------------------|----------------------------|-----------------|-----------------|---------|
| Clause                                                           | Requirement + Test                   |                            |                 | Result - Remark | Verdict |
| <b>6.4.2.3</b>                                                   | <b>TABLE: Test F – Overdischarge</b> |                            |                 |                 | N/A     |
| Model, Sample number                                             | Ambient (20 ± 5 °C)                  | OCV at start of test (Vdc) | Highest MAD (h) | R1 (Ω)          | Results |
|                                                                  |                                      |                            |                 |                 |         |
|                                                                  |                                      |                            |                 |                 |         |
|                                                                  |                                      |                            |                 |                 |         |
|                                                                  |                                      |                            |                 |                 |         |
|                                                                  |                                      |                            |                 |                 |         |
| <b>Supplementary information:</b><br>- No fire<br>- No explosion |                                      |                            |                 |                 |         |

|                            |                                |                            |         |   |
|----------------------------|--------------------------------|----------------------------|---------|---|
| 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 |   |
| #26                        | 23.9                           | 1.646                      | P       |   |
| #27                        | 23.9                           | 1.643                      | P       |   |
| #28                        | 23.9                           | 1.640                      | P       |   |
| #29                        | 23.9                           | 1.644                      | P       |   |
| #30                        | 23.9                           | 1.647                      | P       |   |
| Supplementary information: |                                |                            |         |   |
| - No fire                  |                                |                            |         |   |
| - No explosion             |                                |                            |         |   |
| - No leakage               |                                |                            |         |   |

| IEC 60086-5                                                  |                                                 |                             |                             |                 |                                        |         |
|--------------------------------------------------------------|-------------------------------------------------|-----------------------------|-----------------------------|-----------------|----------------------------------------|---------|
| Clause                                                       | Requirement + Test                              |                             |                             | Result - Remark |                                        | Verdict |
|                                                              | TABLE: Critical components information          |                             |                             |                 |                                        | P       |
| Object / part No.                                            | Manufacturer/<br>trademark                      | Type / model                | Technical data              | Standard        | Mark(s) of<br>conformity <sup>1)</sup> |         |
| Cell                                                         | SUZHOU<br>XINLVZHOU<br>ELECTRONICS<br>CO., LTD. | LR1130                      | 1.5V                        | --              | --                                     |         |
| -Positive<br>electrode                                       | Guangxi Guiliu<br>New Materials Co.,<br>Ltd     | Manganese<br>dioxide        | Manganese<br>dioxide        | --              | --                                     |         |
| -Negative<br>electrode                                       | Zhejiang Changgui<br>Metal Powder Co.,<br>Ltd   | Mercury-free<br>zinc powder | Mercury-free zinc<br>powder | --              | --                                     |         |
| -Separator                                                   | Wenling Juzhi<br>Polymer Materials<br>Co., Ltd  | Insulating film             | Insulating film             | --              | --                                     |         |
| Supplementary information:                                   |                                                 |                             |                             |                 |                                        |         |
| 1) Provided evidence ensures the agreed level of compliance. |                                                 |                             |                             |                 |                                        |         |

**--END--**

Product: Alkaline Battery

Type Designation: LR1130



Figure 1 Front view of battery

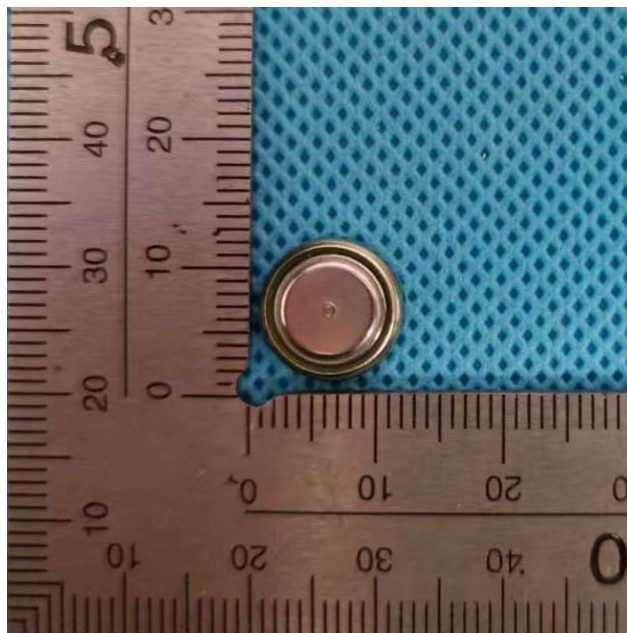


Figure 2 Front view of battery