

Lithium Coin Cell Packaging Guideline for Prevention of Accidental Ingestion

December 21, 2016

Battery Association of Japan

Package design WG of Accidental Ingestion issue

【Outline】

1 Purpose of this guideline

The purpose of this guideline is to prevent infant from accidental ingestion. Ingestion of lithium coin cell can lead to serious situation such as chemical burn after remaining in esophagus.

This guideline specifies standard and evaluation method of packaging that infant can't open.

Suffocation by coin cell is out of this guideline.

2 Scope

Packagings for 3 V primary lithium coin cell (20 mm in diameter) that are sold for general consumer in Japan.

Packagings for export is out of this guideline.

(Shall comply with the law in each country)

3 Principle of packaging for prevention of accidental ingestion

- Packaging size that infant can't swallow
- Packaging that infant can't open by hand

4 Responsible person

Manufacturers, dealers or distributors who sell 3 V primary lithium coin cell

【Standard of package for prevention of accidental ingestion】

1 Packaging size

Packaging shall not pass ingestion gauge.

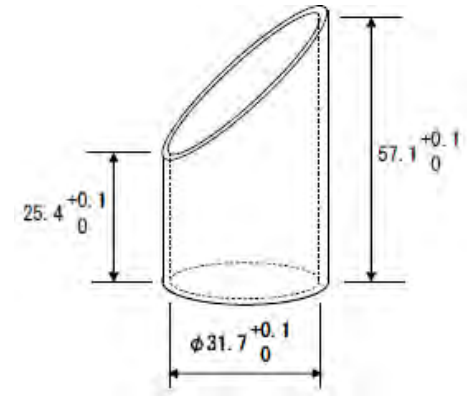
Packaging shall keep original shape.

(As for the size of ingestion gauge, discussion is needed.)

Exemption

In case that cell never have an impact on human body

In case that packaging never dissolve in human body



IEC60086-4

2 Packaging specification

Packaging for prevention of accidental ingestion shall meet any of the following.

- 3. Packaging strength or 4. Packaging structure in this guideline
- Requirement of CHILD TEST stipulated in 16 CFR section 1700.20 of federal law as reference to Position Prevention Packaging Act

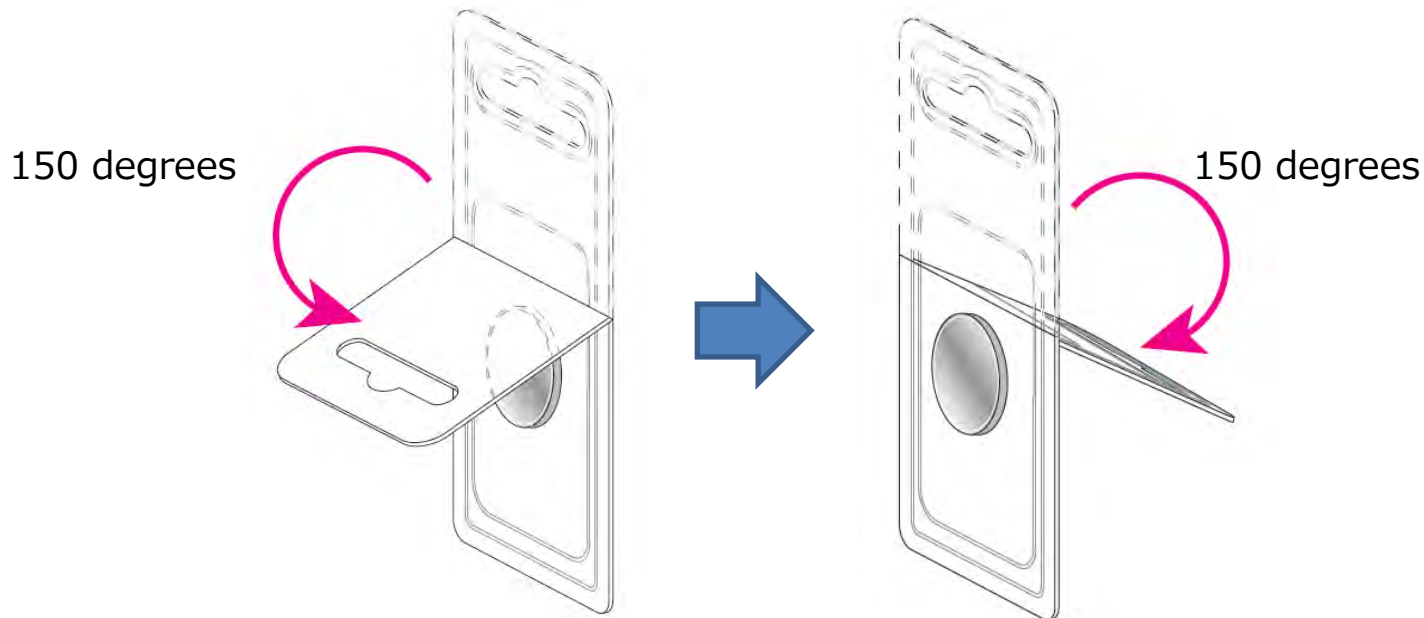
3. Packaging strength

Packaging strength is measured by the following tests that assumed infant's action and shall meet 4.3 criteria.

3.1 Test method

3.1.1 Bending test

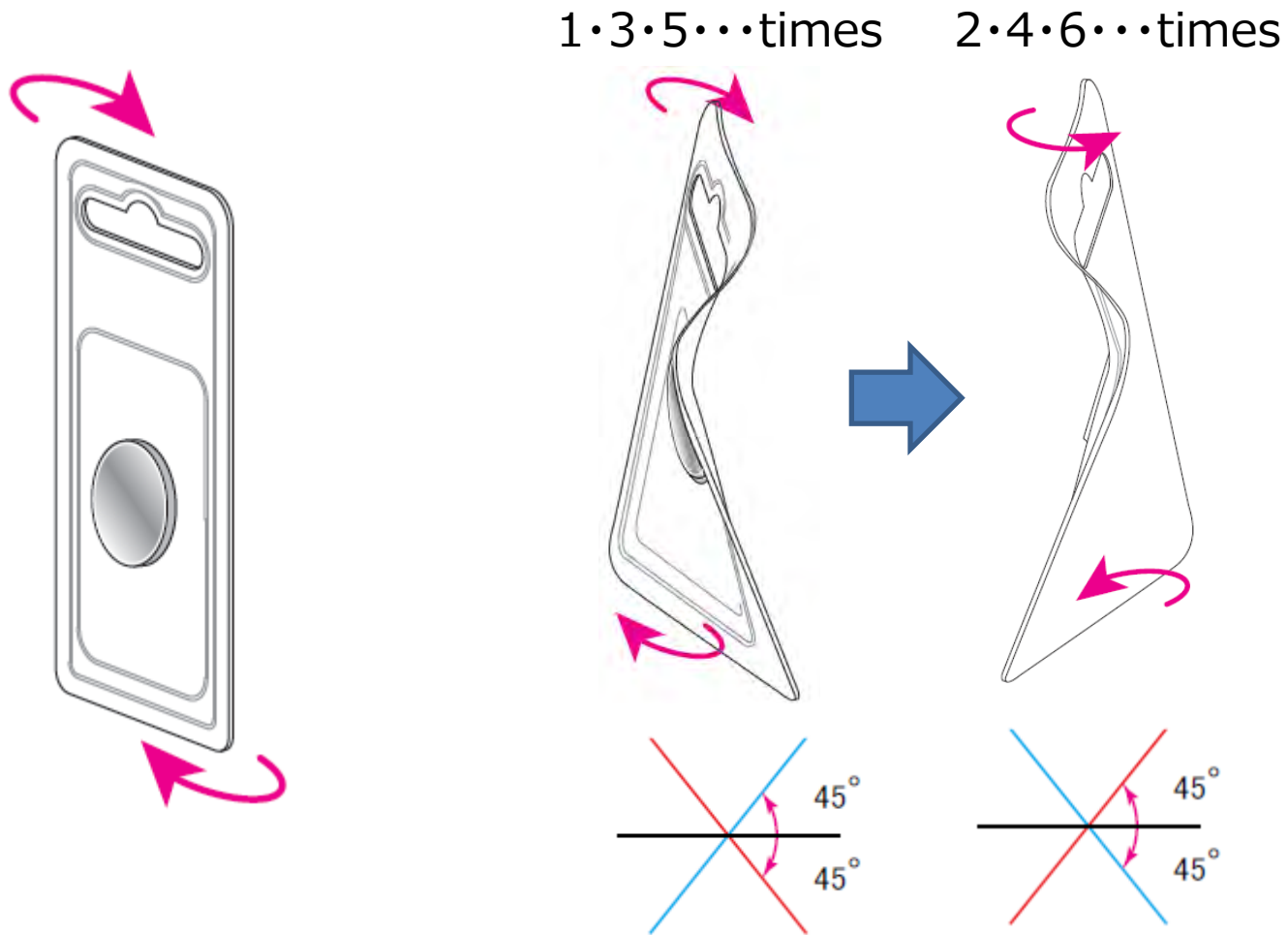
- Bending angle: 150 degrees and over
- Bending direction: Horizontal
- Hold both ends of packaging by hands and bend packaging until one hand touches another hand
- Cell has to be held by one hand at least.



Bending test (1cycle)

3.1.2 Torsion test

- Torsion angle: +/-45 degrees
- Hold both sides of packaging by the flat of the hands and twist packaging diagonally



Torsion test

3.1.3 Tearing test

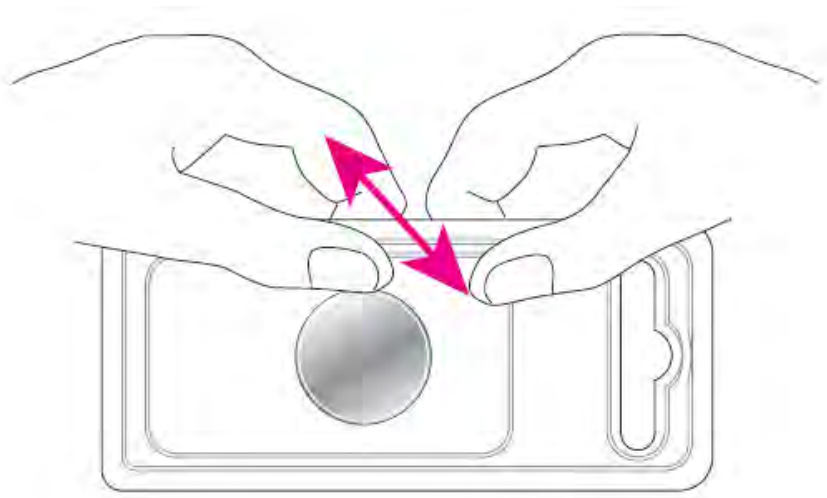
An adult tearing the package, cell shall be kept in packaging after the above test

Tear housing of cell by fingers with the strength of 2.6 kgf

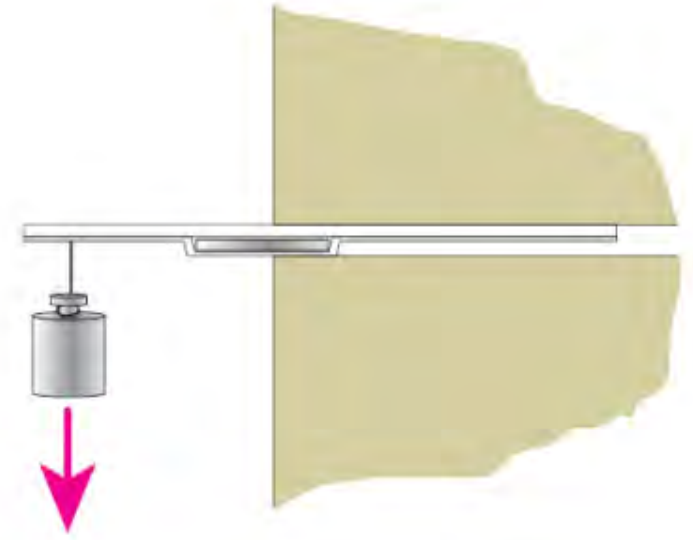
3.1.4 Pushing test

An adult pushes the package, cell shall be kept in packaging after the above test

Turn cardboard up and push cell out with the strength of 5 kgf by using weight



Tearing test



Pushing test

3.2 Test procedure

A series of tests are conducted in the following order.

- | | |
|---------------------------|---------------------------|
| 1) Bending test: 50 times | 5) Bending test: 50 times |
| 2) Torsion test: 50 times | 6) Tearing test: 1 time |
| 3) Tearing test: 1 time | 7) Pushing test: 1 time |
| 4) Torsion test: 50 times | |

3.3 Criteria

- Cell shall be kept in packaging after the above test.
- Size of holding area at the both ends of packaging shall be up to 6 mm in diameter or 10 mm in width.

In case that peel strength is 2.6 kgf and over, the size exceeding the above is also acceptable.

Exemption

In case that cell never have an impact on human body

Package is hard, if that can not be tested in the hands of the adult

4 Endorosed Packaging structure

The endorosed structure to meet the requirements of "3. Packaging strength" shown as follows.

4.1 Non-adhesive part

There are no non-adhesive part at the periphery of the packaging that may become a trigger for the opening of packaging.



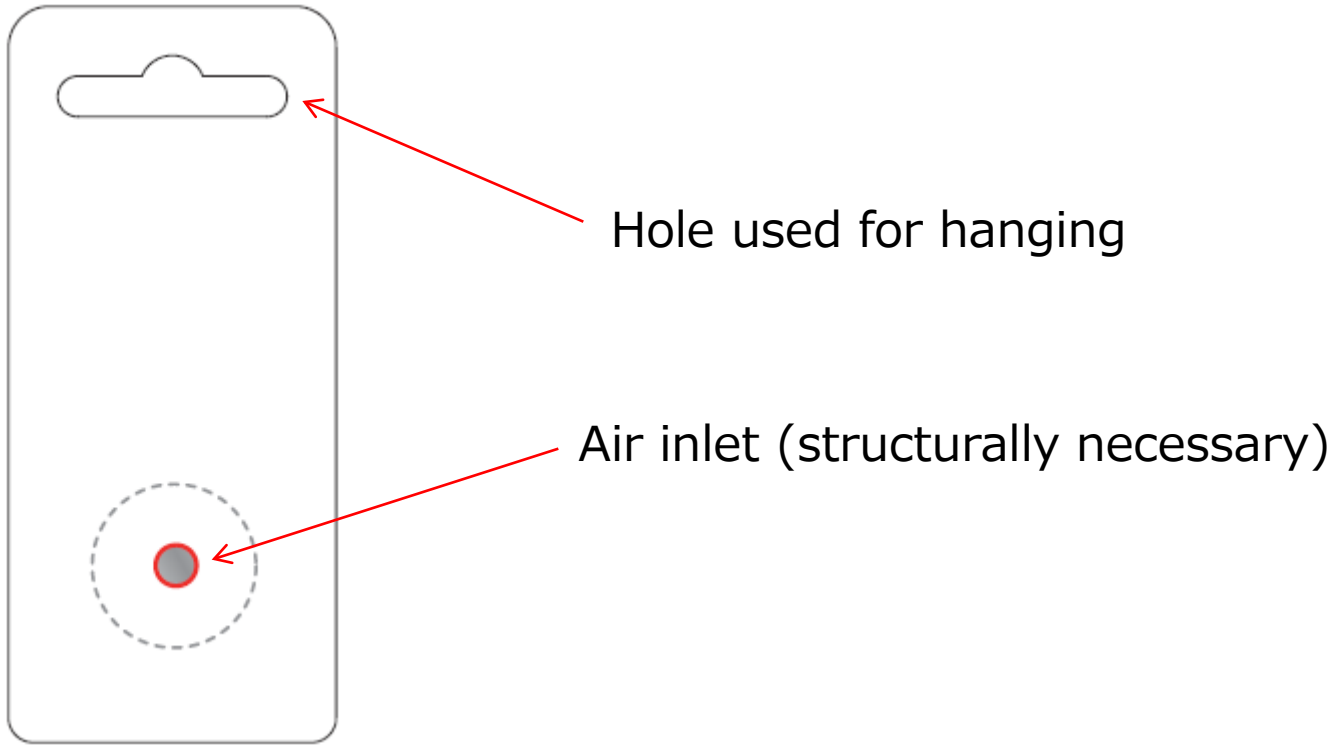
Non-adhesive part of packaging

4.2 Hole

Size of hole in packaging shall be smaller than that of infant's finger.
Size of hole in packaging shall be 6 mm or less.

Exemption

Hole used for hanging that won't affect the opening of packaging



Hole in packaging

4.3 Perforation

There are no perforations that allow cell to be taken out from packaging.

Exemption

In case that perforation won't affect the opening of packaging

In case that perforation in adhesive part won't affect the opening of packaging



Perforation for air inlet
and other perforation

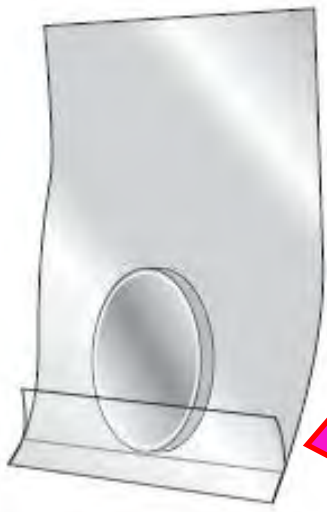


Perforation in
adhesive part

4.4 Soft packaging

The following structure is not acceptable for soft packaging.

- Folding part and gluing part
- Precut or jagged configuration
- Specially treated specification



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Folding part and
gluing part

Precut or jagged
configuration

Specially treated
specification

4.5 Packaging material

Material strength shall not be significantly decreased by moisture.