*＊This document has been prepared taking into account regulations as of January 1, 2021*

# Safety data sheet for product

- This product is an "article" used with the contents sealed. Therefore, issuing and providing SDS is not required by the GHS or any law based on GHS.
- This document has been prepared not to satisfy requirements such as GHS, but for the purpose of providing safety information to customers.
- Refer the other document issued by the shipper, when you want to know whether your current packaging and content comply with transport regulations.

## 1. PRODUCT AND COMPANY IDENTIFICATION

・Product name: Lithium ion rechargeable battery cell
・Product code: None
(All models Sanyo manufactured and whose capacity is less than or equal to 5.4Ah, including the cell branded as Panasonic, excluding the cell whose shape is prismatic and two or more short / middle / long side excess 12mm/85mm/110mm.)
・Company name: Sanyo Electric Co., Ltd., Panasonic group
・Address: 222-1 , Kaminaizen, Sumoto City, Hyogo, Japan
・Telephone number: +81-799-24-4111
・Fax number: +81-799-23-2879
・Emergency telephone number: [Daytime of business day] +81-799-23-3931
[Night and holiday] +81-799-24-4131

## 2. HAZARDS IDENTIFICATION

For the battery cell, chemical materials are stored in a hermetically sealed metal or metal laminated plastic case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, there are no physical hazards such as ignition, explosion and chemical hazards due to leakage of battery contents.

However, if exposed to a fire, added mechanical shocks, decomposed, added electric stress by miss-use, the gas release vent will be operated. The battery cell case will be breached at the extreme, hazardous materials may be released.

Also, if it is heated strongly by surrounding fires or the like, there is a possibility that irritating or harmful gas may be generated.

・GHS classification: Not available
(This product is outside the scope of GHS system since it's considered as an "article".)

・Most important hazard and effects
Human health effects:
Inhalation: The steam of the electrolyte has an anesthesia action and stimulates a respiratory tract.
Skin contact: The steam of the electrolyte stimulates a skin. The electrolyte skin contact causes a sore and stimulation on the skin.
Eye contact: The steam of the electrolyte stimulates eyes. The electrolyte eye contact causes a sore and stimulation on the eye. Especially, substance that causes a strong inflammation of the eyes is contained.
Environmental effects: Since a battery cell remains in the environment, do not throw out it into the environment.

・Specific hazards:
If the electrolyte contacts with water, it will generate detrimental hydrogen fluoride.
Since the leaked electrolyte is inflammable liquid, do not bring close to fire.

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## 3. COMPOSITION / INFORMATION ON INGREDIENTS

・Substance or preparation: Preparation

・Information about the chemical nature of product: *1

| Portion | Material name | Concentration range (wt %) |
|---|---|---|
| Positive electrode | Lithium transition metal oxidate ($Li[M]_m[O]_n$ *2) | 20~60 |
| Positive electrode's base | Aluminum | 1~10 |
| Negative electrode | Carbon | 10~30 |
| Negative electrode's base | Copper | 1~15 |
| Electrolyte | Organic electrolyte principally involves ester carbonate | 5~25 |
| Outer case | Aluminum, iron, aluminum laminated plastic | 1~30 |

**1 Not every product includes all of these materials.*

**2 The letter M means transition metal and candidates of M are Co, Mn, Ni and Al. One compound includes one or more of these metals and one product includes one or more of the compounds. The letter m and n means the number of atoms.*

## 4. FIRST-AID MEASURES

**Spilled internal cell materials**

・Inhalation:
Make the victim blow his/her nose, gargle. Seek medical attention if necessary.

・Skin contact:
Remove contaminated clothes and shoes immediately. Wash extraneous matter or contact region with soap and plenty of water immediately.

・Eye contact:
Do not rub one's eyes. Immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention immediately.

**A battery cell and spilled internal cell materials**

・Ingestion:
Wash out mouth thoroughly. Do not make the victim vomit, unless instructed by medical personnel. Seek medical attention immediately.

## 5. FIRE-FIGHTING MEASURES

・Suitable extinguishing media: Plenty of water, carbon dioxide gas, nitrogen gas, chemical powder fire extinguishing medium and fire foam.

・Specific hazards: Corrosive gas may be emitted during fire.

・Specific methods of fire-fighting: When the battery burns with other combustibles simultaneously, take fire-extinguishing method which correspond to the combustibles. Extinguish a fire from the windward as much as possible.

・Special protective equipment for firefighters: Refer to Section 8-EXPOSURE CONTROLS / PERSONAL PROTECTION (WHEN THE ELECTROLYTE LEAKS)

## 6. ACCIDENTAL RELEASE MEASURES

Spilled internal cell materials, such as electrolyte leaked from a battery cell, are carefully dealt with according to the followings.

・Precautions for human body:
Remove spilled materials with protective equipment (refer to Section 8-EXPOSURE CONTROLS / PERSONAL PROTECTION (WHEN THE ELECTROLYTE LEAKS)). Do not inhale the gas as much as possible. Moreover, avoid touching with as much as possible.

・Environmental precautions: Do not throw out into the environment.

・Method of cleaning up: The spilled solids are put into a container. The leaked place is wiped off with dry cloth.

・Prevention of secondary hazards: Avoid re-scattering. Do not bring the collected materials close to fire.

## 7. HANDLING AND STORAGE

- Handling suggestions
  - Do not connect the positive terminal to the negative terminal with electrical wire or chain.
  - Avoid polarity reverse connection when installing the battery to an instrument.
  - Do not wet the battery with water, seawater, drink or acid; or expose to strong oxidizer.
  - Do not damage or remove the external tube.
  - Keep the battery away from heat and fire.
  - Do not disassemble or reconstruct the battery; or solder the battery directly.
  - Do not give a mechanical shock or deform.
  - Do not use unauthorized charger or other charging method. Terminate charging when the charging process doesn't end within specified time.
- Storage
  - Do not store the battery with metalware, water, seawater, strong acid or strong oxidizer.
  - Make the charge amount less than or equal to 50% then store at -20~40 degree C in a dry (humidity: 45~85%) place.
    Since deterioration will be faster in the high temperature range than in the low temperature range, so do not keep it in the high temperature range beyond the period that is specified by the seller or owner.
  - Use insulative and adequately strong packaging material to prevent short circuit between positive and negative terminal when the packaging breaks during normal handling. Do not use conductive or easy to break packaging material.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION (WHEN THE ELECTROLYTE LEAKS)

- Control parameters
  ACGIH has not been mentioned control parameter of electrolyte.
- Personal protective equipment
  Respiratory protection: Respirator with air cylinder, dust mask
  Hand protection: Protective gloves
  Eye protection: Goggles or protective glasses designed to protect against liquid splashes
  Skin and body protection: Working clothes with long sleeve and long trousers

## 9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance
  Physical state: Solid
  Form: Cylindrical or Prismatic or Pouch (laminated)
  Color: Metallic color or black (without tube if it has tube)
  Odor: No odor

## 10. STABILITY AND REACTIVITY

- Stability: Normally stable unless a strong shock is applied or heated strongly
- Possibility of hazardous reactions: Damage to the container may cause leakage of contents. Contents may leak or ignite due to temperature rise.
- Conditions to avoid: Crushing or deformation, use and storage at 80 degree C or higher or at high humidity. Usage at a voltage or a current outside the rating and external short circuit.
- Incompatible materials: Conductive material such as water or metal pieces. Oxidizing agent such as bleach.
- Hazardous decomposition products: Irritating or harmful gases are released if a leakage or fire occurs.

## 11. TOXICOLOGICAL INFORMATION

**Organic Electrolyte**

- Acute toxicity:
  $LD_{50}$, oral - Rat 2,000mg/kg or more
- Irritating nature: Irritative to skin and eye

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12. ECOLOGICAL INFORMATION

・Persistence/degradability:

Since a battery cell and the internal materials remain in the environment, do not bury or throw out into the environment.

13. DISPOSAL CONSIDERATIONS

・Recommended methods for safe and environmentally preferred disposal:

**Product (waste from residues)**

Specified collection or disposal of lithium ion battery is required by the law like as "battery control law" in several nations. Collection or recycle of the battery is mainly imposed on battery's manufacturer or importer in the nations recycle is required.

**Contaminated packaging**

Neither a container nor packing is contaminated during normal use. When internal materials leaked from a battery cell contaminates, dispose as industrial wastes subject to special control.

14. TRANSPORT INFORMATION

In the case of transportation, avoid exposure to high temperature and prevent the formation of any condensation. Take in a cargo of them without falling, dropping and breakage. Prevent collapse of cargo piles and wet by rain. The container must be handled carefully. Do not give shocks that result in a mark of hitting on a cell. Please refer to Section 7-HANDLING AND STORAGE also.

**UN regulation**

・UN number: 3480 (3481 when the battery is contained in equipment or packed with equipment, 3171 when the battery is contained in vehicle and that is only powered by the battery)

・Proper shipping name:
Lithium ion batteries (“lithium ion batteries contained in equipment” or “lithium ion batteries packed with equipment” for 3481, "Battery-powered vehicle" for 3171)

・Class: 9 *

** Although this product meets the criteria of “dangerous goods” and are classified as “lithium ion batteries”, depending on the battery’s total capacity in the packaging, etc., they may not be subject to the fully regulated provisions.*

**Regulation depends on region and transportation mode**

・Worldwide - Air transportation:
ICAO TI/IATA-DGR

・Worldwide - Ocean transportation:
IMO-IMDG Code

・Europe - Ground transportation:
ADR

15. REGULATORY INFORMATION

・Regulations specifically applicable to the product:
Wastes Disposal and Public Cleansing Law [Japan]
Law for Promotion of Effective Utilization of resources [Japan]
US Department of Transportation 49 Code of Federal Regulations [USA]

** About overlapping regulations, please refer to Section 14-TRANSPORT INFOMATION.*

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16. OTHER INFORMATION

- This safety data sheet is offered an agency who handles this product to handle it safely.
- The agency should utilize this safety data sheet effectively (put it up, educate person in charge) and take proper measures.
- ***The information contained in this Safety data sheet is based on the present state of knowledge and current legislation.***
- This safety data sheet provides guidance on health, safety and environmental aspects of the product and should not be construed as any guarantee of technical performance or suitability for particular applications.

Reference

Dangerous Goods Regulations – 62nd Edition Effective 1 January 2021: International Air Transport Association (IATA)
IMDG Code – 2018 Edition: International Maritime Organization (IMO)
The European Agreement concerning the International Carriage of Dangerous Goods by Road – 2019: The United Nations Economic Commission for Europe (UNECE)

First edition: Apr. 28, 2010
Prepared and approved by: Product Development Promotion Department
Energy Solutions Business Division
Sanyo Electric Co., Ltd.
Panasonic group