

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 including the cell branded as Panasonic.) Company name: Sanyo Electric Co., Ltd., Panasonic group

Address: 1-1 Matsushita-cho, Moriguchi City, Osaka 570-8511, Japan Telephone number: +81-80-8932-7972

Emergency telephone number: +81-6-6994-4933

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.

This document has been prepared taking into account regulations as of January 1, 2022

3. COMPOSITION / INFORMATION ON INGREDIENTS

Substance or preparation: Preparation

Information about the chemical nature of product: ^a Portion Material name CAS No. Concentration range (wt %)
12190-79-3
12031-65-1

Positive electrode Lithium transition metal oxide 12057-17-9

(Li[M]_m[O]_n)^b 182442-95-1
20~60 207803-51-8

Negative electrode Carbon 7782-42-5

7440-44-0 10~30

Ethyl methyl carbonate

Ethylene carbonate

Diethyl carbonate

623-53-0 105-58-8 5~25

Electrolyte

96-49-1

Lithium hexafluorophosphate

21324-40-3

Outer case	Aluminum, iron, aluminum laminated plastic	7429-90-5 7439-89-6	1~30
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^a Not every product includes all of these materials.

^b 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)

This document has been prepared taking into account regulations as of January 1, 2022

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

Density : N/A

Boiling Point : N/A

Melting Point : N/A

Evaporation Rate : N/A
Vapor Pressure : N/A
Molecular Weight : N/A
Solubility : N/A
pH : N/A
Viscosity : N/A
Other Information ; N/A

3/5

Product name: Lithium ion rechargeable battery cell Reference number: SDS-IBT-00030

Establishment / Revision: Dec. 13, 2021

This document has been prepared taking into account regulations as of January 1, 2022

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:

LD₅₀, oral - Rat 2,000mg/kg or more

Irritating nature: Irritative to skin and eye

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.

The table mentioned below is applied to only the lithium ion rechargeable battery cell described in Section

1-PRODUCT AND COMPANY IDENTIFICATION.

LAND TANSPORT

SEA TRANSPORT

AIR TRANSPORT

(ADR)

(IMDG / IMO)

(IATA / ICAO)

Proper Shipping
LITHIUM ION

LITHIUM ION

Name ^a BATTERIES

LITHIUM ION

BATTERIES

BATTERIES

(including lithium ion

(including lithium ion

(including lithium ion

polymer batteries)

polymer batteries)

polymer batteries)

Packing Group ^b	II	II	II
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^a UN Number is 3481 in case of the battery is contained in equipment or packed with equipment, and Proper Shipping Name is "lithium ion batteries contained in equipment" or "lithium ion batteries packed with equipment".

UN Number is 3171 in case of the battery is contained in vehicle which is only powered by the battery, and Proper Shipping Name is "Battery-powered vehicle".

^b Lithium ion rechargeable battery cell is not assigned to packing groups, and the packaging performance level is set out in the applicable packing instruction. Packing group II is often set out.

4/5

Product name: Lithium ion rechargeable battery cell Reference number: SDS-IBT-00030

Establishment / Revision: Dec. 13, 2021

This document has been prepared taking into account regulations as of January 1, 2022

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 INFORMATION.

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 – 63rd Edition Effective 1 January 2022: International Air Transport Association (IATA)

IMDG Code – 2020 Edition: International Maritime Organization (IMO)

The European Agreement concerning the International Carriage of Dangerous Goods by Road – 2021: The United Nations Economic Commission for Europe (UNECE)

First edition: Apr. 28, 2010

Prepared and approved by: Department of Development strategy
Corporate of Development strategy
Cell Development Division
Sanyo Electric Co., Ltd.

Panasonic

Test report No.E2131801

Jan

Test summary of UN test for Lithium ion cell

Customer Model : NCR18650GA

Product Name : NCR18650

Manufacturer : SANYO Electric Co., Ltd. 222-1 Kamineizen, Sumoto City, Hyogo 656-8555, Japan
 Tel +81-799-23-3631, email prb-bp-ta@ml.jp.panasonic.com
<https://industrial.panasonic.com/na/products/batteries/>

M. Takahashi General Manager
 Energy Solutions Business Division
 SANYO Electric Co., Ltd.

Test Laboratory : Same as the manufacturer

We declare that this cell passed UN test.

Manual of Tests and Criteria (38.3 Lithium batteries)		Test results	Note	Number of test cells	
No.	Test item				
T 1	Altitude simulation	Pass		First cycle fully charged 10 cells	
T 2	Thermal test	Pass			
T 3	Vibration	Pass			
T 4	Shock	Pass			
T 5	External short circuit	Pass			
T 6	Crush	Pass		First cycle 50% charged 5 cells	
T 7	Overcharge	-	For battery only	For battery only	
T 8	Forced discharge	Pass		First cycle, fully discharged 10 cells	After 50 cycles, fully discharged 10

*1 The test data may contain additional test result other than above table.

Lithium ion cell Specification

Item	Value/Description	Note
Watt-hour rating	12 Wh	

Nominal voltage	3.6 V	
Weight	max. 49.5 g	
Physical description	Cylindrical cell with shrink tube	
Lithium equivalent content	0.99 g	

Above test procedures are compliant to the following manual.

(Manual of Tests and Criteria ST/SG/AC.10/11/Rev.5A1, PartIII, sub-section 38.3)

Judgment for necessity of test items is carried out based on the latest rules, and it is not linked with the version actually tested.

Panasonic

Test report No. E2131801

Jan

Certificate of Package Drop Test for Lithium ion Cell

Customer Model : NCR18650GA

Product Name : NCR18650G

2/1 H. Kuroda Senior Manager
Battery Pack Engineering Dept.
Energy Solutions Business Divi.
SANYO Electric Co., Ltd.

We declare that this cell passed UN test.

Test item	Test results	Note
Package Drop Test	Pass	The package shall be dropped from 1.2m high on to a concrete surface (flat and horizontal) with five orientations (drop once a sample) ;

Lithium ion cell Specification

Item	Nominal value	Note
Watt-hour rating	12 Wh	
Nominal voltage	3.6 V	
Lithium equivalent content	0.99 g	

Above test procedures are compliant to the following regulation.

(Model Regulations ST/SG/AC.10/1/Rev.21, Special Provision188)