

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
- Company name: Panasonic Energy Co., Ltd.
- 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.

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 %)
Positive electrode	Lithium transition metal oxidate (Li[M] _m [O] _n) ^b	12190-79-3 12031-65-1 12057-17-9 182442-95-1 207803-51-8	20~60
Positive electrode's base	Aluminum	7429-90-5	1~10
Negative electrode	Carbon	7782-42-5 7440-44-0	10~30
Negative electrode's base	Copper	7440-50-8	1~15
Electrolyte	Ethyl methyl carbonate Diethyl carbonate Ethylene carbonate Lithium hexafluorophosphate	623-53-0 105-58-8 96-49-1 21324-40-3	5~25
Outer case	Aluminum, iron, aluminum laminated plastic	7429-90-5 7439-89-6	1~30

^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)

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

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 (ADR)	SEA TRANSPORT (IMDG Code)	AIR TRANSPORT (IATA DGR/ICAO TI)
UN Number ^a	3480	3480	3480
Proper Shipping Name ^a	LITHIUM ION BATTERIES (including lithium ion polymer batteries)	LITHIUM ION BATTERIES (including lithium ion polymer batteries)	LITHIUM ION BATTERIES (including lithium ion polymer batteries)
Hazard Class	9	9	9
Packing Group ^b	II	II	II

^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.

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 – 65th Edition Effective 1 January 2024: International Air Transport Association (IATA)
IMDG Code – 2022 Edition: International Maritime Organization (IMO)
Agreement concerning the International Carriage of Dangerous Goods by Road – 2023(ADR): 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
Panasonic Energy Co., Ltd.

Test summary of UN test for Lithium ion cell

M. Takahashi

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

Product Name : UR18650ZY
 Manufacturer : SANYO Electric Co., Ltd. 222-1 Kaminaizen, Sumoto City, Hyogo 656-8555, Japan
 Tel +81-799-23-3931, email prb-bp-ta@ml.jp.panasonic.com
 https://industrial.panasonic.com/ww/products/batteries/
 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 cells

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

Lithium ion cell Specification

Item	Value/Description	Note
Watt-hour rating	9.3 Wh	
Weight	max. 47 g	
Physical description	Cylindrical cell with shrink tube	
Lithium equivalent content	0.75 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.

Certificate of Package Drop Test for Lithium ion cell

Customer Model : UR18650ZY
Product Name : UR18650Z

H. Kuroda
H. Kuroda General Manager
Technology Planning Department
Rechargeable Battery Business Division
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) ; (1)flat on the bottom, (2)flat on the top, (3)flat on the long side, (4)flat on the short side, (5)on the corner

Lithium ion cell Specification

Item	Nominal value	Note
Watt-hour rating	9.3 Wh	
Lithium equivalent content	0.75 g	

Above test procedures are compliant to the following regulation.
(Model Regulations ST/SG/AC.10/1/Rev.18, Special Provision188)



货物运输条件鉴定书

Certification for Safe Transport of Chemical Goods

锂电池类货物

样品名称： 锂电池/锂离子蓄电池UR18650ZY (3.7V/9.3Wh)

Sample name: LI-ION BATTERY UR18650ZY (3.7V/9.3Wh)

委托单位： 三洋能源(苏州)有限公司
SANYO ENERGY (SUZHOU) CO., LTD.

生产单位： 三洋能源(苏州)有限公司
SANYO ENERGY (SUZHOU) CO., LTD.



Witness Better Life
SICIT 上海化工院检测有限公司
Shanghai Institute of Chemical Industry Testing Co., Ltd



货物运输条件鉴定书

NO. 212200603478336

Certification for Safe Transport of Chemical Goods

Page 1/3

样品名称 Sample Name	中文 Chinese	锂电池/锂离子蓄电池UR18650ZY (3.7V/9.3Wh)		
	英文 English	LI-ION BATTERY UR18650ZY (3.7V/9.3Wh)		
委托单位 Consignor		三洋能源(苏州)有限公司 SANYO ENERGY(SUZHOU) CO., LTD.		
生产单位 Manufacturer		三洋能源(苏州)有限公司 SANYO ENERGY(SUZHOU) CO., LTD.		
检验方法、程序 Inspection method and procedure		国际海事组织《国际海运危险货物规则》(2020版) IMO International Maritime Dangerous Goods Code (2020 Edition)		
样品外观 Sample appearance		红色塑料薄膜外壳 Red Plastic film shell		
包装件信息 Package information		重量≤30kg. weight≤30kg.		
序号 NO.	电池种类 Battery type	型号 Model	容量Capacity /锂含量Li content	放置方式 Placement
1	可充电锂离子电池芯 Rechargeable Li-ion cell	UR18650ZY	9.3Wh	电池单独运输 Battery only
鉴定结论 IDENTIFICATION CONCLUSION	1. 危险性识别(Hazards identification) 锂离子电池。 Lithium ion battery.			
	2. 海运按照国际海事组织《国际海运危险货物规则》办理的类项(Suggestion according to IMO IMDG Code) 根据特殊规定188, 该物品不受IMO IMDG Code其他条款限制。 The article is not subject to other provisions of IMO IMDG Code according to special provision 188.			
	3. 包装要求(Packaging requirements) 无。 None.			
	检验日期: 2021-12-04 签发日期: 2021-12-06 生效日期: 2022-01-01 Inspection Date: Issue Date: Effective Date:			
备注 Comment		/		



批准
Approver: 王东

审核
Checker: 董学胜

主检
Appraiser: 宋翠丹



货物运输条件鉴定书

Certification for Safe Transport of Chemical Goods

NO. 212200603478336

Page 2/3

序号 No.	检验结果及其他事项 Inspection results and other things
1	本报告所述锂电池按照《国际海运危险货物规则》(2020版) 2.9.4.5规定的质量管理体系进行制造。 Lithium cells and batteries listed in this report were manufactured under the quality management program described in IMDG CODE 2020 EDITION 2.9.4.5.
2	本报告所述锂电池已通过《联合国试验和标准手册》第III部分38.3小节相应测试要求。 包装件能够承受1.2m跌落试验。 Lithium cells and batteries listed in this report are of the types proved to meet the requirements of each applicable test in the UN Manual of Tests and Criteria, Part III, sub-section 38.3. The package has passed the 1.2m drop test. UN38.3试验概要编号 The UN38.3 Test Summary No. (s) 811900800347093 详细信息请扫描右侧二维码。 Please scan the QR code on the right for more information. 
3	锂电池完全封装在内包装内, 位于坚固的外包装中。 Lithium cells and batteries are packed in inner packagings that completely enclose the cell or battery and placed in a strong outer packaging.
4	电池具有适当的防短路措施。 Cells and batteries are properly protected to prevent short circuits.
5	每个包装件必须标示恰当的锂电池标记。 装有锂电池的包装件, 符合国际民航组织《危险物品安全航空运输技术细则》第4部分第11章的包装说明965或968第IB部分规定的, 黏贴5.2.1.10(锂电池标记)和5.2.2.2所示的9A型标签, 应视为符合本特殊规定188的规定。 Each package shall be marked with the appropriate lithium battery mark. Packages containing lithium batteries packed in conformity with the provisions of part 4, chapter 11, packing instructions 965 or 968, section IB of the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by air that bear the mark as shown in 5.2.1.10(lithium battery mark) and the label shown 5.2.2.2, Model No.9A shall be deemed to meet the provisions of this special provision 188.
6	/
7	/

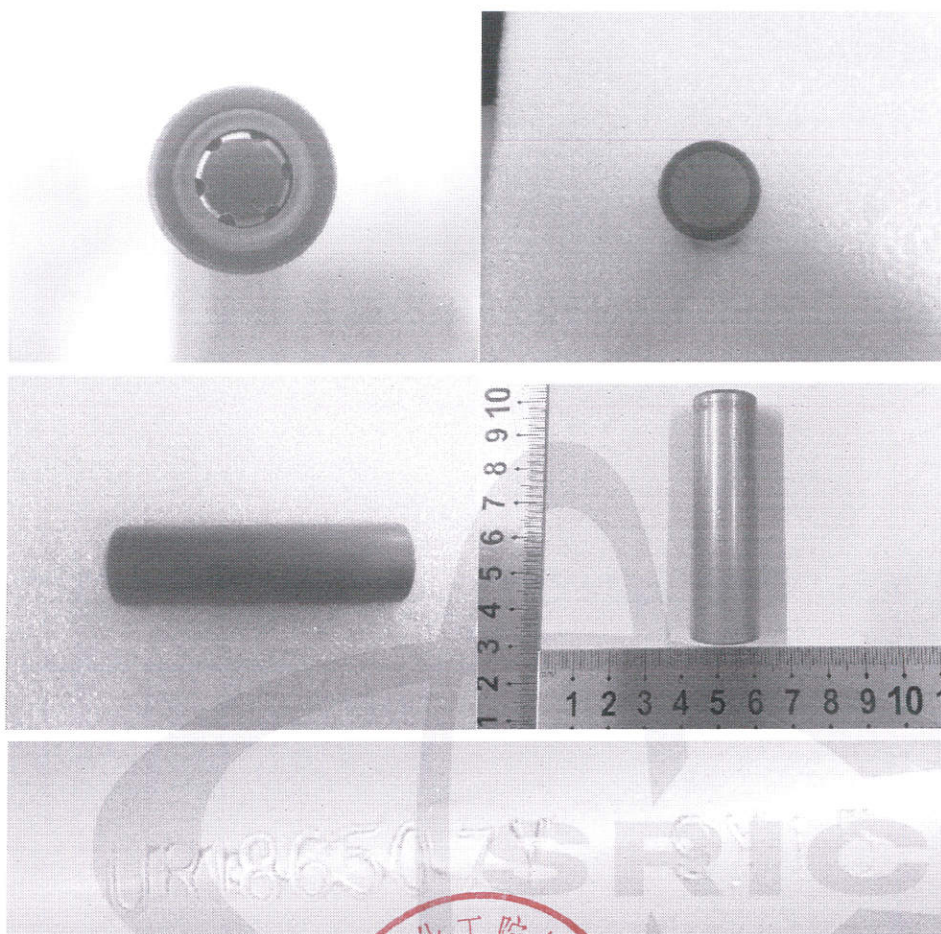
-验证码:230213-

货物运输条件鉴定书

Certification for Safe Transport of Chemical Goods

NO. 212200603478336

Page 3/3



报告结束

Issued date: November. 6, 2023

No. 1R23-0056-1

To whom it may concern

Non-use Certificate of Hazardous Substances regulated by RoHS Directive

We, Panasonic Energy Co., Ltd. hereby certify that we do not use intentionally and control to be below the limit for the ten hazardous substances regulated by Directive (EU) 2015/863 of RoHS Directive (2011/65/EU), excluding exempted use.

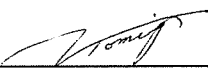
The substance contents of homogeneous materials are as follows :

Mercury (Hg)	Less than 1000 ppm
Cadmium (Cd)	Less than 100 ppm
Lead (Pb)	Less than 1000 ppm
Hexavalent chromium (Cr ⁶⁺)	Less than 1000 ppm
PBB, PBDE	Less than 1000 ppm
Bis(2-ethylhexyl) phthalate (DEHP)	Less than 1000 ppm
Butyl benzyl phthalate (BBP)	Less than 1000 ppm
Dibutyl phthalate (DBP)	Less than 1000 ppm
Diisobutyl phthalate (DIBP)	Less than 1000 ppm

The applicable product models are as follows :

Product Name : Lithium Ion Battery (Bare Cell)

Model Name : UR18650ZY

Signature : 
Signed by : Noboru Tominaga
Title : Chief
Department : Development Promotion Department
System Development Division
Company : Panasonic Energy Co., Ltd.
E-mail : prb-eco@ml.jp.panasonic.com