

## Explanatory sheet about safety of product for transportation (Safety Data Sheet for transportation)

### 1. Basic item

Product name	Lithium ion battery ("Lithium ion battery" includes lithium polymer battery in this document)
UN number	3480
Product code	Refer to Table 1.
Product model name	Refer to Table 1.
Manufacturer	SANYO Electric Co., Ltd., Panasonic group
Address	222-1 Kaminaizen, Sumoto, Hyogo, Japan
Department in charge	Technology Planning Department Rechargeable Battery Business Division
Phone number	+81-799-23-3931
E-mail	prb-bp-ta@ml.jp.panasonic.com

### 2. Product information

#### Basic composition of the product

This product is a battery which consists of such main component as core battery pack assembled with some Lithium ion cells. And it consists of any combination of plastic casing, tube casing, protection circuit boards, safety devices and interface terminals.

### 3. Safety Information

- SANYO certifies the battery has passed and satisfied the UN Manual of Tests and Criteria Part III, sub-section 38.3 testing in SANYO shipping.
- SANYO manufactured the battery under the quality management program required in UN Model regulations 2.9.4(e).

#### 3-1) Component cell

The Watt-hour rating of the component Lithium ion cells is not more than 20Wh.  
Refer to Appendix "SDS (SDS-IBH-00486)".

#### 3-2) Battery pack

1. The Watt-hour rating of the battery is not more than 100Wh.
2. Packages of the battery satisfy the following conditions when SANYO ships.
  - (1) The package has passed the drop test from the height of 1.2m.
  - (2) The package net weight is not more than 10kg.
  - (3) The package is marked and labeled according to requirement of the Packing Instruction 965 Section IB stated in ICAO's and IATA's dangerous goods regulations.
3. The battery is not defective for safety reasons, not damaged. It is not collected battery for recycling or disposal.
4. The battery is not subject to the fully regulated requirements for Dangerous Goods in ocean and ground transportation.
5. The battery should be transported by Cargo aircraft as UN3480, Class 9 Dangerous Goods, and state of charge not exceeding 30%, according to requirement of the Packing Instruction 965 Section IB stated in ICAOs' and IATA's dangerous goods regulations.



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**Table.1 Model list of application**

Battery Part Numbers			Battery Information						
Lenovo ASM Lenovo PN Part Number	Lenovo FRU Part Number	Lenovo model name	MSDS Type #	UN DOT 38.3 Test Certificate	Cell Voltage (V)	Battery Voltage (V)	Watt hour Rating (Wh)	Weight (grams)	Equivalent Lithium Content (grams)
31502371		31502371	SDS-IBH-00486	31502371_UN38.3	3.7	14.8	92.8	697	7.52
31504217		31504217	SDS-IBH-00486	31504217_UN38.3	3.7	14.8	46	345	3.76
31506605		31506605	SDS-IBH-00486	31506605_UN38.3	3.7	11.1	73	505	5.94
31507327		31507327	SDS-IBH-00486	31507327_UN38.3	3.7	14.8	49	345	3.96
5B10M95762		L14S3P24	SDS-IBH-00486	5B10M95762_UN38.3	3.75	11.25	45	200	3.60
5B10H52788		L14S3P24	SDS-IBH-00486	5B10H52788_UN38.3	3.75	11.25	45	200	3.60
121500267		L14S4P71	SDS-IBH-00486	121500267_UN38.3	3.85	7.7	44	212	3.28
42T4934	42T4935 42T4984		SDS-IBH-00486	42T4934_UN38.3	3.7	14.8	43	262	3.60
42T4964	42T4963		SDS-IBH-00486	42T4964_UN38.3	3.7	7.4	25	142	1.97
45N1084	45N1085		SDS-IBH-00486	45N1084_UN38.3	3.7	14.8	49	266	3.96
45N1088	45N1089		SDS-IBH-00486	45N1088_UN38.3	3.7	11.1	47	285	3.80
45N1092	45N1093		SDS-IBH-00486	45N1092_UN38.3	3.7	14.8	43	250	3.60
45N1096	45N1097		SDS-IBH-00486	45N1096_UN38.3	3.7	3.7	30	185	2.44
45N1714	45N1715		SDS-IBH-00486	45N1714_UN38.3	3.75	3.75	21	111	1.64
45N1720	45N1721		SDS-IBH-00486	45N1720_UN38.3	3.7	3.7	30	185	2.44
45N1740	45N1741		SDS-IBH-00486	45N1740_UN38.3	3.75	11.25	44	250	3.52
121500061		L11S2P01	SDS-IBH-00486	121500061_UN38.3	3.7	7.4	27	59	2.22
121500232		L13S2P21	SDS-IBH-00486	121500232_UN38.3	3.7	7.4	36	190	2.97
121500225		L13S4P21	SDS-IBH-00486	121500225_UN38.3	3.7	7.4	54	380	4.38
121500234		L13S6P71	SDS-IBH-00486	121500234_UN38.3	3.7	11.1	49	298	3.98
5B10H11758		L14S2P21	SDS-IBH-00486	5B10H11758_UN38.3	3.7	7.4	30	160	2.77
5B10K10179		L14S2P21	SDS-IBH-00486	5B10K10179_UN38.3	3.7	7.4	30	160	2.77
5B10H17229		L14S2P22	SDS-IBH-00486	5B10H17229_UN38.3	3.8	7.6	35	160	2.77
5B10K10175		L14S2P22	SDS-IBH-00486	5B10K10175_UN38.3	3.8	7.6	35	160	2.77
5B10H11760		L14S3P21	SDS-IBH-00486	5B10H11760_UN38.3	3.7	11.1	45	226	3.64
5B10H11759		L14S4P21	SDS-IBH-00486	5B10H11759_UN38.3	3.7	7.4	60	310	4.86
5B10H22086		L14S4P22	SDS-IBH-00486	5B10H22086_UN38.3	3.7	14.8	60	266	3.60
5B10G84689		L14S4P72	SDS-IBH-00486	5B10G84689_UN38.3	3.75	7.5	45	220	3.74
5B10K10226		L14S4P72	SDS-IBH-00486	5B10K10226_UN38.3	3.75	7.5	45	220	3.74
5B10H54717		L14S4PB0	SDS-IBH-00486	5B10H54717_UN38.3	3.75	15	60	266	3.60
5B10L04211		L15S2P01	SDS-IBH-00486	5B10L04211_UN38.3	3.8	7.6	33	160	2.77
SB10K10388		L15S6PA1	SDS-IBH-00486	SB10K10388_UN38.3	3.7	11.1	88	505	5.94
5B10M90490		L16S2PB1	SDS-IBH-00486	5B10M90490_UN38.3	3.8	7.6	34	160	2.77
5B10M33723		L16S4TB0	SDS-IBH-00486	5B10M33723_UN38.3	3.8	16.8	60	210	4.93
LT1423			SDS-IBH-00486	LT1423_UN38.3	3.7	3.7	30	185	2.44
SB10F46443	00HW005		SDS-IBH-00486	SB10F46443_UN38.3	3.75	7.5	35	164	2.80
SB10F46447	00HW009		SDS-IBH-00486	SB10F46447_UN38.3	3.75	15	66	303	5.28
SB10F46449	00HW011		SDS-IBH-00486	SB10F46449_UN38.3	3.75	7.5	35	164	2.80
SB10F46453	00HW015		SDS-IBH-00486	SB10F46453_UN38.3	3.75	15	66	303	5.28
SB10F46459	00HW021		SDS-IBH-00486	SB10F46459_UN38.3	3.8	11.4	53	240	4.15
SB10F46460	00HW022		SDS-IBH-00486	SB10F46460_UN38.3	3.75	11.25	24	115	1.88
SB10J78990	00HW042		SDS-IBH-00486	SB10J78990_UN38.3	3.8	11.4	42	181	3.32

## Safety data sheet for product

### 1. PRODUCT AND COMPANY IDENTIFICATION

- Product name: Lithium ion rechargeable battery cell
- Product code: None  
(All pouch (polymer) models Sanyo manufactured and whose capacity is less than or equal to 5.4Ah, including the cell branded as Panasonic, excluding the cell 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 is no physical danger of ignition or explosion and chemical danger of hazardous materials' leakage.

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.

Moreover, if heated strongly by the surrounding fire, acrid gas may be emitted.

- 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: \*1

Portion	Material name	CAS No.	Concentration range (wt %)
Positive electrode	Lithium transition metal oxidate (Li[M] <sub>m</sub> [O] <sub>n</sub> *2)	12190-79-3 12057-17-9 182442-95-1	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	623-53-0 105-58-8 96-49-1	5~25
Outer case	Aluminum laminated plastic	7429-90-5	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:  
Make the victim vomit. When it is impossible or the feeling is not well after vomiting, seek medical attention.

**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:  
Respiratory protection: Respiratory equipment of a gas cylinder style or protection-against-dust mask  
Hand protection: Protective gloves  
Eye protection: Goggle or protective glasses designed to protect against liquid splashes  
Skin and body protection: Protective cloth

**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 (protective glasses and protective gloves). 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 30~50% then store at room temperature or less (temperature= -20~35 degree C) in a dry (humidity: 45~85%) place. Avoid direct sunlight, high temperature, and high humidity.
  - 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: Pouch (laminated)
  - Color: Metallic color or black (without tube if it has tube)
  - Odor: No odor

## 10. STABILITY AND REACTIVITY

- Stability: Stable under normal use
- Hazardous reactions occurring under specific conditions
  - Conditions to avoid: When a battery cell is exposed to an external short-circuit, crushes, deformation, high temperature above 100 degree C, it will be the cause of heat generation and ignition. Direct sunlight and high humidity.
  - Materials to avoid: Conductive materials, water, seawater, strong oxidizers and strong acids.
  - Hazardous decomposition products: Acrid or harmful gas is emitted during fire.

## 11. TOXICOLOGICAL INFORMATION

### **Organic Electrolyte**

- Acute toxicity:
  - LD<sub>50</sub>, 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.

### **UN regulation**

- UN number: 3480 (3481 when the battery is contained in equipment or packed with equipment)

- Proper shipping name:

Lithium ion batteries ("lithium ion batteries packed with equipment" or "lithium ion batteries contained in equipment")

- 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/IATA-DGR [packing instruction 965 section IB or II]

(When shipping batteries "packed with" or "contained in" equipment, use packing instruction 966 or 967 as appropriate.)

- Worldwide - Ocean transportation:

IMO-IMDG Code [special provision 188]

- Europe - Ground transportation:

ADR [special provision 188]

*\* Instructions or provisions in the box brackets are conditions to make the battery cell exempted from full regulation.*

## 15. REGULATORY INFORMATION

- Regulations specifically applicable to the product:

Wastes Disposal and Public Cleaning 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 – 59th Edition Effective 1 January 2018: International Air Transport Association (IATA)  
IMDG Code – 2016 Edition: International Maritime Organization (IMO)  
The European Agreement concerning the International Carriage of Dangerous Goods by Road – 2017:  
The United Nations Economic Commission for Europe (UNECE)

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Rechargeable Battery Business Division  
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