

Explanatory sheet about safety of product (Safety Data Sheet)

## 1. Basic item

Product name	Lithium ion battery
UN number	3480
Customer Product Name	Refer to Table 1.
TOCAD Model	Refer to Table 1.
Manufacturer	TOCAD ENERGY Co.,Ltd.
Address	4-1-14 HIGASHIMACHI SHIROISHISHI,MIYAGI, JAPAN
Department in charge	Production Control Div. Products Engineering Development
Phone number	0224-25-0133
E-mail	<a href="mailto:info_quality@tocad.co.jp">info_quality@tocad.co.jp</a>

## 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

- TOCAD ENERGY certifies the battery has passed and satisfied the UN Manual of Tests and Criteria Part III, sub-section 38.3 testing in SANYO shipping.
- TOCAD ENERGY manufactured the battery under the quality management programme 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-IBT-00026)".

## 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 product name "Lithium ion batteries" and how to deal with the damage of the package are written on the label and attached document.
  - (2) The package has passed the drop test from the height of 1.2m.
  - (3) The package weight is not more than 10kg.
  - (4) The package satisfies the requirements of IATA DGR 54th edition Packing Instruction 965 Section IB.
3. The battery is not defective for safety reasons, not damaged. It is not collected battery for recycling or disposal.
4. The battery can be transferred as Non Dangerous Goods (Not Restricted) in sea and road transportation.
5. The battery should be transported as Dangerous Goods in air transportation.

Person in charge


  
TOCAD ENERGY Co., Ltd.  
Production Control Div. Products Engineering Development  
Makoto Kambayashi



Table 1.

No.	Customer Product number	Product model name	Voltage [V]	Capacity [Ah]	Cell Number	Wh Rating
1	BCL1415(C112335A)	H4UR18650W2B-M-HKG-0808	14.4	1.5	4	23
2	BCL1415(C112335B)	H4UR18650W2B-M-HKG-0809	14.4	1.5	4	23
3	BCL1815(C112337A)	H5UR18650W2A-M-HKG-0806	18	1.5	5	29
4	BCL1815(C112337B)	H5UR18650W2A-M-HKG-0807	18	1.5	5	29
5	BSL1430(C112433A)	H4UR18650W2A-2-M-HKG-0794	14.4	3	8	46
6	BSL1430(C112320B)	H4UR18650W2A-2-M-HKG-0791	14.4	3	8	46
7	BSL1430(C111329C)	H4UR18650W2A-2-M-HKG-0792	14.4	3	8	46
8	BSL1430(C111329D)	H4UR18650W2A-2-M-HKG-0793	14.4	3	8	46
9	BSL1430(C112320E)	H4UR18650W2A-2-M-HKG-0801	14.4	3	8	46
10	BSL1430(C344863A)	H4UR18650W2A-2-M-HKG-0802	14.4	3	8	46
11	BSL1430(C338230K)	H4UR18650W2A-2-M-HKA-0815	14.4	3	8	46
12	EBM1830(C108207A)	H5UR18650W2A-2-M-HKG-0642	18	3	10	54
13	EBM1830(C108207B)	H5UR18650W2A-2-M-HKG-0641	18	3	10	54
14	EBM1830(C108207D)	H5UR18650W2A-2-M-HKG-0880	18	3	10	54
15	BSL2530(C108826A)	H7UR18650W2A-2-M-HKG-0646	25.2	3	14	76
16	BSL2530(C108826B)	H7UR18650W2A-2-M-HKG-0647	25.2	3	14	76
17	BSL2530(C112883A)	H7UR18650W2A-2-M-HKG-0899	25.2	3	14	76
18	BSL3626(C108827A)	H10UR18650SA-2-M-HKG-0499	36	2.6	20	94
19	BSL3626(C108827B)	H10UR18650SA-2-M-HKG-0464	36	2.6	20	94
20	BSL3626(C112884B)	H10UR18650SA-2-M-HKG-0898	36	2.6	20	94
21	BCL1420(C112148A)	H4UR18650RX-M-HKG-0854	14.4	2	4	29
22	BCL1820(C112149A)	H5UR18650RX-M-HKG-0853	18	2	5	36
23	BCL1440(C112150A)	H4UR18650RX-2-M-HKG-0850	14.4	4	8	58
24	BCL1840(C112151A)	H5UR18650RX-2-M-HKG-0849	18	4	10	58
25	BSL1420(C112144A)	H4UR18650RX-M-HKG-0852	14.4	2	4	29
26	BSL1420(C112457B)	H4UR18650RX-M-HKG-0855	14.4	2	4	29
27	BSL1820(C112145A)	H5UR18650RX-M-HKG-0851	18	2	5	36
28	BSL1820(C112145B)	H5UR18650RX-M-HKG-0892	18	2	5	36
29	BSL1440(C112146A)	H4UR18650RX-2-M-HKG-0848	14.4	4	8	58
30	BSL1440(C112458B)	H4UR18650RX-2-M-HKG-0856	14.4	4	8	58
31	BSL1440(C112146D)	H4UR18650RX-2-M-HKG-0889	14.4	4	8	58
32	BSL1440(C344867A)	H4UR18650RX-2-M-HKG-0896	14.4	4	8	58
33	BSL1840(C112151A)	H5UR18650RX-2-M-HKG-0849	18	4	10	72
34	BSL1840(C112147A)	H5UR18650RX-2-M-HKG-0847	18	4	10	72
35	BSL1840(C112459B)	H5UR18650RX-2-M-HKG-0857	18	4	10	72
36	BSL1840(C112147C)	H5UR18650RX-2-M-HKG-0893	18	4	10	72
37	BSL1840(C112147D)	H5UR18650RX-2-M-HKG-0888	18	4	10	72
38	BSL1840(C112147E)	H5UR18650RX-2-M-HKG-0894	18	4	10	72
39	BSL1840(C112147F)	H5UR18650RX-2-M-HKG-0902	18	4	10	72
40	BSL1840(C344868A)	H5UR18650RX-2-M-HKA-0897	18	4	10	72
41	EBM315(C211710C)	H1UR18650W2A-M-HKG-0640	3.7	1.5	1	6
42	EBM1430R(C111408A)	H4UR18650W2A-2-M-HKG-0634	14.4	3	8	46
43	EBM1430R(C111408B)	H4UR18650W2A-2-M-HKA-0688	14.4	3	8	46
44	BCL1430(C108655A)	H4UR18650W2A-2-M-HKG-0633	14.4	3	8	46
45	BCL1430(C108655B)	H4UR18650W2A-2-M-HKG-0635	14.4	3	8	46
46	BSL1415X(C213959A)	H4UR18650SA-X-M-HKG-0605	14.4	1.5	4	23
47	BSL1415X(C213959B)	H4UR18650SA-X-M-HKG-0608	14.4	1.5	4	23
48	BSL1815X(C213924A)	H5UR18650SA-X-M-HKG-0604	18	1.5	5	29
49	BSL1815X(C213924B)	H5UR18650SA-X-M-HKG-0609	18	1.5	5	29
50	BSL1830(C109469D)	H5UR18650W2A-2-M-HKG-0645	18	3	10	54
51	BSL1830(C109469E)	H5UR18650W2A-2-M-HKG-0643	18	3	10	54
52	BSL1830(C109469F)	H5UR18650W2A-2-M-HKG-0711	18	3	10	54
53	BSL1830(C109469G)	H5UR18650W2A-2-M-HKA-0728	18	3	10	54
54	BSL1830(C337025B)	H5UR18650W2A-2-M-HKA-0759	18	3	10	54
55	BSL1425(C113263A)	H4UR18650NSX-M-HKG-0908	14.4	2.5	4	36
56	BSL1425(C113263D)	H4UR18650NSX-M-HKA-0922	14.4	2.5	4	36
57	BSL1425(C218544A)	H4UR18650NSX-M-HKA-0914	14.4	2.5	4	36
58	BSL1825(C113265A)	H5UR18650NSX-M-HKG-0911	18	2.5	5	45
59	BSL1825(C113265D)	H5UR18650NSX-M-HKA-0920	18	2.5	5	45
60	BSL1825(C218546A)	H5UR18650NSX-M-HKA-0912	18	2.5	5	45
61	BSL1450(C113264A)	H4UR18650NSX-2-M-HKG-0909	14.4	5	8	72
62	BSL1450(C113264D)	H4UR18650NSX-2-M-HKA-0921	14.4	5	8	72
63	BSL1450(C218545A)	H4UR18650NSX-2-M-HKA-0915	14.4	5	8	72

Table 1.

No.	Customer Product number	Product model name	Voltage [V]	Capacity [Ah]	Cell Number	Wh Rating
64	BSL1850(C113266A)	H5UR18650NSX-2-M-HKG-0910	18	5	10	90
65	BSL1850(C113266D)	H5UR18650NSX-2-M-HKA-0919	18	5	10	90
66	BSL1850(C218547A)	H5UR18650NSX-2-M-HKA-0913	18	5	10	90
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## Safety data sheet for product

### 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, excluding the cell whose shape is prismatic and two or more side of short / middle / long side excess 12mm/85mm/110mm.)
- Company name: Sanyo Electric Co., Ltd.
- Address: 222-1, Kaminaizen, Sumoto City, Hyogo, Japan
- Telephone number: +81-799-24-4111
- Fax number: +81-799-23-2879
- Emergency telephone number: [Weekday] +81-799-23-3931 [Night and holiday] +81-799-24-4131

### 2. 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 ( $\text{Li}[\text{M}]_m[\text{O}]_n$ *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.

### 3. 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.

- 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.

#### 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.

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#### 5. FIRE-FIGHTING MEASURE

- 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

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#### 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.

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#### 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.



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**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: Goggle or protective glasses designed to protect against liquid splashes  
Skin and body protection: Working clothes with long sleeve and long trousers
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**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
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**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: Acid or harmful gas is emitted during fire.
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**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
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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.
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**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.

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#### 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 contained in equipment" or "lithium ion batteries packed with equipment")
- Class: 9 \*
- Packing group: II \*

*\* However this product is defined as above, it is **not** recognized as "DANGEROUS GOODS" or is treated as almost non-DANGEROUS GOODS when its transport condition accords with instructions or provisions depend on region and transportation mode.*

*About the instructions or provisions, please see descriptions in box brackets of following regulations.*

##### Regulation depends on region and transportation mode

- Worldwide, air transportation:  
IATA-DGR [As non-DANGEROUS GOODS: "packing instruction 965 section II" /  
Almost as above however displayed as DANGEROUS GOODS: "packing instruction 965 section IB"]  
(When batteries are packaged with equipments or contained in equipments, refer packing instruction 966 or 967 instead of 965.)
- Worldwide, sea transportation:  
IMO-IMDG Code [special provision 188]
- Europe, road transportation:  
ADR [special provision 188]

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#### 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.*

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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 – 54th Edition Effective 1 January 2013: International Air Transport Association (IATA)

IMDG Code – 2012 Edition: International Maritime Organization (IMO)

The European Agreement concerning the International Carriage of Dangerous Goods by Road – 2013:

The United Nations Economic Commission for Europe (UNECE)

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First edition: Apr. 28, 2010

Prepared and approved by

Technical Administration Group

Portable Rechargeable Battery Business Division

Sanyo Electric Co., Ltd.