

## Material Safety Data Sheet

### 1. PRODUCT AND COMPANY IDENTIFICATION

- Product name: Lithium ion rechargeable battery pack
- **Product code: 34-B 001 MSDS No. A-11E**  
 (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: **Walter Surface Technologies Inc.**
- Address: 810 Day Hill Road, Windsor, CT, USA 06095
- Telephone number: 860-298-1100
- Fax number: 860-298-1112
- Emergency telephone number: 1-800-535-5053 (INFOTRAC)

### 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 (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.

Under normal use, this battery is not expected to expose user to hazardous ingredients.

USA: This battery is an article pursuant to 29 CFR 1910.1200 and, as such, is not subject to the OSHA Hazard Communication Standard requirement. The information contained in this Material Safety Data Sheet contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and available for employees and other users of this product.

Canada: This is not a controlled product under WHMIS. This product meets the definition of a "manufactured article" and is not subject to the regulations of the Hazardous Products Act.

### 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, or added electric stress through misuse, the gas release vent will be operated. If the battery cell case is breached, hazardous materials may be released. Moreover, if the battery is heated strongly by any surrounding fire or open flames, acrid gas may be emitted.

- Most important hazard and effects

Human health effects:

**Inhalation:** The vapor generated by the electrolyte has an anesthesia action and irritates the respiratory tract.

**Skin contact:** The steam of the electrolyte irritates the skin. The electrolyte skin contact causes a sore and irritation to the skin.

**Eye contact:** The vapor generated by the electrolyte irritates the eyes. Eye contact causes a sore and irritation to the eye. Especially, substance that causes a strong inflammation of the eyes is contained.

**Environmental effects:** Do not dispose of into the environment.

- Specific hazards:

If the electrolyte makes contact with water, it will generate detrimental hydrogen fluoride.

Since the leaked electrolyte is a flammable liquid, do not expose to or bring near any open flame.

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#### 4. FIRST-AID MEASURES

##### **Spilled internal cell materials**

- Inhalation:

Make the victim blow his/her nose and gargle water to remove contaminants. 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 victim still feels unwell even 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 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 methods 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, should be carefully dealt with as follows:

- Precautions for human body:

Remove spilled materials with protective equipment (protective glasses and protective gloves). Avoid inhaling the gas as much as possible. Moreover, avoid touching the internal cell materials as much as possible.

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

- Method of cleaning up: The spilled solids should be put into a container. The area of the spill should be wiped off with a 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 reverse polarity 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 metal ware, water, seawater, strong acid or strong oxidizer.
  - Make the charge amount 30~50% then store at room temperature or less (temperature= -20~35°C or -4~95°F) in a dry (humidity: 45~85%) place. Avoid direct sunlight, high temperature, and high humidity.
  - Use isolative 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 specified control parameters for the 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°C (212°F)), it will cause heat generation and ignition. Direct sunlight and high humidity should also be avoided.
  - Materials to avoid: Conductive materials, water, seawater, strong oxidizers and strong acids.
  - Hazardous decomposition products: Acrid or harmful gas is emitted during fire.
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## 11. TOXICOLOGICAL INFORMATION

### Organic Electrolyte

- Acute toxicity:  
LD50, oral - Rat 2,000mg/kg or more
  - Irritating nature: Irritates the skin and eyes
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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 such as "battery control law" in several nations. Collection or recycling of the battery is mainly imposed on battery's manufacturer or importer in the nations in which recycling is required.

### Contaminated packaging

Neither a container nor packing is contaminated during normal use. When internal materials leak from a battery cell, dispose of the packaging 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 extra care to prevent 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.

**California Prop 65:**

This product does not contain chemicals known to the State of California to cause cancer or reproductive toxicity.

**Canada**

**Domestic Substances List (DSL)**

All ingredients are listed on the DSL.

**CEPA – National Pollutant Release Inventory (NPRI)**

All ingredients are not specifically listed.

**Additional USA Regulatory Lists**

CERCLA: None

SARA Title III – Section 302: None

SARA Title III – Section 311/312: None

SARA Title III – Section 313: None

New Jersey Right To Know: None

Section 112: Hazardous Air Pollutants (HAPS): NoNe

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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. The information and recommendations set forth are made in good faith and accurate at the date of preparation.***
- 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)