

**SECTION 1. CHEMICAL PRODUCT AND COMPANY NAME****Lithium-Ion Rechargeable Battery Pack  
BL1041B****Safety Data Sheet**Complies with the OSHA Hazard  
Communication Standard :  
29 CFR 1910 1200Makita U.S.A., Inc.  
14930-C Northam Street  
La Mirada, CA 90638

Prepared By : Stan Rodrigues

Date Revised: 03/01/2019

**EMERGENCY CONTACT INFORMATION****Telephone Number for Information:** MAKITA: 1-510-657-9881**Emergency Response**For Chemical Emergency  
Spills, Leak, Fire, Exposure, or Accident  
Call CHEMTREC Day or Night  
Within USA and Canada 1-800-424-9300**SECTION 2. HAZARD IDENTIFICATION:**

The product is a Lithium ion battery and is therefore classified as an article and is not hazardous when used according to the recommendations of the manufacturer. The hazard is associated with the contents of the cell or battery. Under recommended use conditions, the electrode materials and liquid electrolyte are non-reactive.

**SECTION 3. COMPOSITION, INFORMATION OR 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 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

**CONTINUED: SECTION 3. COMPOSITION, INFORMATION OR INGREDIENTS:**

Outer case	Aluminum, iron, aluminum laminated plastic	7429-90-5 7439-89-6	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 include one or more of the compounds. The letter M and N means the number of atoms.			

**SECTION 4. FIRST AID MEASURE:****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 eye. 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.

**SECTION 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 I PERSONAL PROTECTION (WHEN THE ELECTROLYTE LEAKS)

**SECTION 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 I 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.

## SECTION 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 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.

## SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION:

### Control parameters

ACGIH has not been mentioned control parameter of electrolyte.

### Personal protective equipment

- |                           |   |
|---------------------------|---|
| Respiratory protection:   | Respirator with air cylinder, dust mask                                   |
| Hand protection:          | Respirator with air cylinder, dust mask                                   |
| Eye protection:           | Goggles or protective glasses designed to protect against liquid splashes |
| Skin and body protection: | Working clothes with long sleeve and long trousers                        |

## SECTION 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   |

## SECTION 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: Acrid or harmful gas is emitted during leakage or fire.

## SECTION 11. TOXICOLOGICAL INFORMATION:

### Organic Electrolyte

Acute toxicity: LD<sub>50</sub>, oral - Rat 2,000mg/kg or more

Irritating nature: Irrigative to skin and eye

## SECTION 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.

## SECTION 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.

## SECTION 14. TRANSPORT INFORMATION:

- The cells in these batteries have been tested and meet the requirements for the UN Manual of Tests and Criteria, Part III, subsection 38.3
- When a number of batteries are transported by ship, vehicle and railroad avoid high temperature and dew condensation.
- Avoid transportation which may cause damage of package.
- Lithium-ion batteries are not subject to dangerous goods regulation for the purpose of transportation by the International Maritime Dangerous Goods regulations (IMDG). For Lithium-ion batteries, the Watt-hour rating is no more than 20Wh /cell and 100Wh/ battery pack can be treated as "non-dangerous goods" by the United Nations Recommendations on the Transport of Dangerous Goods/Special Provision 188, provided that the products are prevented from being short-circuited with each other and are packaged in an appropriate condition which satisfies Packing Group II performance level.
- IATA (International Air Transport Association): Dangerous Goods Regulation Packing Instruction 965 (Lithium ion or lithium polymer cells and batteries without electronic equipment) went into effect April 1, 2016: Lithium ion cells and batteries must be offered for transport at a state of charge not exceeding 30 per cent of their rated capacity. UN 3480, PI 965, Section IA and IB and II will be restricted to carriage on cargo aircraft. All packages must bear the Cargo Aircraft Only label in addition to the other marks and labels required by the Regulations.
- US Hazardous Materials Regulations 49 CFR (Code of Federal Regulations) Sections 173-185 Lithium batteries and cells.

Section II requirements apply to lithium-ion cells with a Watt-hour rating not exceeding 20 Wh and lithium-ion batteries with a Watt-hour rating not exceeding 100 Wh packed in quantities that within the allowance permitted in Section II, Table 965-11.

**TABLE 965-II**

Contents	Lithium-ion cells and/or batteries with a Watt-hour rating of 2.7 Wh or less	Lithium-ion cells with a Watt-hour rating of more than 2.7Wh but not more than 20Wh	Lithium-ion batteries with a Watt-hour rating of more than 2.7Wh but not more than 100Wh
Maximum number of cells / batteries per package	No limit	8 cells	2 Batteries
Maximum net quantity per package	2.5 kg	N/A	N/A

Lithium-ion cells and batteries meeting the requirements in this section are not subject to other additional requirements of these Regulations except for:

## **CONTINUED: SECTION 14. TRANSPORT INFORMATION:**

- Each cell and battery is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, Part III, subsection 38.3;
    - cells and batteries must be manufactured under a quality management program;
    - for batteries, The Watt-hour rating must be marked on the outside of the battery case;
    - Each package must be capable of withstanding a 1.2m drop test in any orientation without:
      - damage to cells or batteries contained therein;
      - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
      - release of contents.
  - Each package must be marked with the lithium battery mark and the cargo aircraft only Label.
  - A shipper is not permitted to offer for transport more than one package prepared according to Section II in any single consignment
- Section IB requirements apply to lithium-ion cells with a Watt-hour rating not exceeding 20 Wh and lithium-ion batteries with a Watt-hour rating not exceeding 100 Wh packed in quantities that exceed the allowance permitted in Section II, Table 965-II.

Quantities of lithium-ion cells or batteries that exceed the allowance permitted in Section II, Table 965-II must be assigned to Class 9 and are subject to all of the applicable provisions of Regulation.

Where classified as lithium batteries packed with equipment (UN3481), IATA Dangerous Goods Regulations packing instruction 966 is applied.

Where classified as lithium batteries installed in equipment (UN3481), IATA Dangerous Goods Regulations packing instruction 967 is applied.

## **SECTION 15. REGULATORY INFORMATION:**

Regulations specifically applicable to the product:

US Department of Transportation 49 Code of Federal Regulations [USA]

\* About overlapping regulations, please refer to Section 14-TRANSPORT INFORMATION.

## **SECTION 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 - 60th Edition Effective 1 January 2019:

International Air Transport Association (IATA)

IMDG Code - 2018 Edition: International Maritime Organization (IMO)

The European Agreement concerning the International Carriage of Dangerous Goods by Road - 2019:

The United Nations Economic Commission for Europe (UNECE)

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The product is a Lithium ion battery and is therefore classified as an article and is not hazardous when used according to the recommendations of the manufacturer. The hazard is associated with the contents of the cell or battery. Under recommended use conditions, the electrode materials and liquid electrolyte are non-reactive.

**SECTION 3. COMPOSITION, INFORMATION OR INGREDIENTS:**

\* Substance or preparation: Preparation

\* Information about the chemical nature of product: \*1

Portion	Material Name	CAS No.	Concentration Range (wt %)
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Electrolyte	Ethyl methyl carbonate Diethyl carbonate Ethylene carbonate Lithium hexafluorophosphate	623-53-0 105-58-8 96-49-1 21324-40-3	5~25

**CONTINUED: SECTION 3. COMPOSITION, INFORMATION OR INGREDIENTS:**

Outer case	Aluminum, iron, aluminum laminated plastic	7429-90-5 7439-89-6	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 include one or more of the compounds. The letter M and N means the number of atoms.			

**SECTION 4. FIRST AID MEASURE:****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 eye. 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.

**SECTION 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 I PERSONAL PROTECTION (WHEN THE ELECTROLYTE LEAKS)

**SECTION 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 I 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.

## SECTION 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 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.

## SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION:

### Control parameters

ACGIH has not been mentioned control parameter of electrolyte.

### Personal protective equipment

- |                           |   |
|---------------------------|---|
| Respiratory protection:   | Respirator with air cylinder, dust mask                                   |
| Hand protection:          | Respirator with air cylinder, dust mask                                   |
| Eye protection:           | Goggles or protective glasses designed to protect against liquid splashes |
| Skin and body protection: | Working clothes with long sleeve and long trousers                        |

## SECTION 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   |

## SECTION 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: Acrid or harmful gas is emitted during leakage or fire.



## SECTION 11. TOXICOLOGICAL INFORMATION:

### Organic Electrolyte

Acute toxicity: LD<sub>50</sub>, oral - Rat 2,000mg/kg or more

Irritating nature: Irrigative to skin and eye

## SECTION 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.

## SECTION 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.

## SECTION 14. TRANSPORT INFORMATION:

- The cells in these batteries have been tested and meet the requirements for the UN Manual of Tests and Criteria, Part III, subsection 38.3
- When a number of batteries are transported by ship, vehicle and railroad avoid high temperature and dew condensation.
- Avoid transportation which may cause damage of package.
- Lithium-ion batteries are not subject to dangerous goods regulation for the purpose of transportation by the International Maritime Dangerous Goods regulations (IMDG). For Lithium-ion batteries, the Watt-hour rating is no more than 20Wh /cell and 100Wh/ battery pack can be treated as "non-dangerous goods" by the United Nations Recommendations on the Transport of Dangerous Goods/Special Provision 188, provided that the products are prevented from being short-circuited with each other and are packaged in an appropriate condition which satisfies Packing Group II performance level.
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Section II requirements apply to lithium-ion cells with a Watt-hour rating not exceeding 20 Wh and lithium-ion batteries with a Watt-hour rating not exceeding 100 Wh packed in quantities that within the allowance permitted in Section II, Table 965-11.

**TABLE 965-II**

Contents	Lithium-ion cells and/or batteries with a Watt-hour rating of 2.7 Wh or less	Lithium-ion cells with a Watt-hour rating of more than 2.7Wh but not more than 20Wh	Lithium-ion batteries with a Watt-hour rating of more than 2.7Wh but not more than 100Wh
Maximum number of cells / batteries per package	No limit	8 cells	2 Batteries
Maximum net quantity per package	2.5 kg	N/A	N/A

Lithium-ion cells and batteries meeting the requirements in this section are not subject to other additional requirements of these Regulations except for:

## **CONTINUED: SECTION 14. TRANSPORT INFORMATION:**

- Each cell and battery is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, Part III, subsection 38.3;
    - cells and batteries must be manufactured under a quality management program;
    - for batteries, The Watt-hour rating must be marked on the outside of the battery case;
    - Each package must be capable of withstanding a 1.2m drop test in any orientation without:
      - damage to cells or batteries contained therein;
      - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
      - release of contents.
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  - A shipper is not permitted to offer for transport more than one package prepared according to Section II in any single consignment
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Quantities of lithium-ion cells or batteries that exceed the allowance permitted in Section II, Table 965-II must be assigned to Class 9 and are subject to all of the applicable provisions of Regulation.

Where classified as lithium batteries packed with equipment (UN3481), IATA Dangerous Goods Regulations packing instruction 966 is applied.

Where classified as lithium batteries installed in equipment (UN3481), IATA Dangerous Goods Regulations packing instruction 967 is applied.

## **SECTION 15. REGULATORY INFORMATION:**

Regulations specifically applicable to the product:

US Department of Transportation 49 Code of Federal Regulations [USA]

\* About overlapping regulations, please refer to Section 14-TRANSPORT INFORMATION.

## **SECTION 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.

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