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## PRODUCT INFORMATION SHEET

### SECTION 1: IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE SUPPLIER

**Product Name:** Lithium-Ion Rechargeable Battery

**Product Description:** Battery pack and products with lithium-ion cells

**Date of issue/Revision Date:** July 3, 2019

**Manufacturer/Distributor:**

Robert Bosch Tool Corporation  
1800 W. Central Road  
Mt. Prospect, IL 60056

**For More Information, Call:**

(Monday-Friday, 8:00 AM– 5:00 PM CST)  
Bosch Customer Service  
(877) 267-2499

**In Case of Emergency, Call:**

(24 Hours/Day, 7 Days/Week)  
(877) 303-0891

### SECTION 2: HAZARDS IDENTIFICATION

| Health                                            | Environmental                         | Physical                                |
|---------------------------------------------------|---------------------------------------|-----------------------------------------|
| Eye Irritation: No classified hazards             | Acute Toxicity: No classified hazards | Flammable liquid: No classified hazards |
| Skin Irritation: No classified hazards            |                                       |                                         |
| Acute Toxicity, Oral: No classified hazards       |                                       |                                         |
| Acute Toxicity, Inhalation: No classified hazards |                                       |                                         |

**GHS Label:**

No applicable labeling

**Hazard Statements/Precautionary Statements:**

No exposure during routine handling of product

**Classified Hazards**

This material is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200. This SDS contains valuable information for the safe handling and proper use of this product. Save this SDS for future reference.

**Other Hazards**

**Flammable:**

Organic components will burn if cell is incinerated. Combustion of cell contents may cause evolution of Hydrogen Fluoride.

**Potential Health Effects:**

Fluoride interferes with nerve impulse conduction causing severe pain or absence of sensations.



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**Warning:**

No exposure during routine handling of product. Hydrofluoric Acid exposure during firefighting: This information is given for the use of professional fire fighters responding to a warehouse fire where fire from other materials may incinerate batteries. This section is provided solely in case of exposure, during firefighting, to the combustion by-products.

### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

**Composition:**

| Ingredient          | Chemical Name                                                | CAS #        | Concentration (%) |
|---------------------|--------------------------------------------------------------|--------------|-------------------|
| Electrolyte         | Electrolyte salt and solvent                                 | Various      | 5-25              |
| Electrolyte solvent | Organic solvent (e.g. Ethylene carbonate, Dimethylcarbonate) | Various      | 5-25              |
| Electrolyte salt    | Lithium hexafluorophosphate (LiPF <sub>6</sub> )             | 21324-40-3   | 0.05-5            |
| Cathode             | Lithium transition metal oxide/ Lithium metal phosphate      | Confidential | 20-60             |
| Anode               | Graphite/Carbon, others                                      | Various      | 10-30             |
| Cathode substrate   | Aluminium                                                    | 7429-90-5    | 1-10              |
| Anode substrate     | Copper                                                       | 7440-50-8    | 1-15              |
| Binder              | PVDF, SBR, others                                            | Various      | <5                |
| Others              | Steel, nickel, other inert components                        | Various      | Balance           |

### SECTION 4: FIRST AID MEASURES

No exposure during routine handling of product. Risk of exposure occurs only if the battery is mechanically or electrically abused. No effect under routine handling and use to eyes, skin or if inhaled. Ingestion is not likely, given the physical size and state of the cell. If swallowed, seek medical attention immediately.

If exposure to internal materials within cell due to damaged outer casing the following actions are recommended:

**Eye contact:**

Rinse eyes with water for 15 minutes without rubbing and seek medical attention.

**Skin contact:**

Wash area thoroughly with soap and water. If irritation continues seek medical attention.

**Inhalation:**

Leave area immediately and move to fresh air and seek medical attention.

**Ingestion:**

If swallowed, contact POISON CONTROL CENTER immediately.

### SECTION 5: FIREFIGHTING MEASURES

**NFPA 704 Hazard Class****HMIS**

0 (Minimal)  
1 (Slight)  
2 (Moderate)  
3 (Serious)  
4 (Severe)



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**Suitable Extinguishing Media:**

Water spray, carbon dioxide, dry chemical powder or appropriate foam. Use agent appropriate for surrounding materials.

**Unsuitable Extinguishing Media:**

None.

**Products of Combustion:**

Organic components will burn if incinerated. Combustion of cell contents may cause evolution of Hydrogen Fluoride. In case of fire in an adjacent area, use water, CO<sub>2</sub>, or dry chemical extinguishers if cells are packed in their original containers since the fuel of the fire is basically paper products.

**Protection of Firefighters:**

Hydrofluoric Acid exposure during firefighting: This information is given for the use of professional fire fighters responding to a warehouse fire where fire from other materials may incinerate batteries. This section is provided solely in case of exposure, during firefighting, to the combustion by-products.

### SECTION 6: ACCIDENTAL RELEASE MEASURES

**Personal Precautions:**

Use standard industrial clothing in normal use. If handling large containers of cells wear steel-toed footwear.

**Environmental Precautions:**

No special precautions necessary.

**Methods for Containment:**

Transport container outdoors. Hold burned cells and fire cleanup solids for disposal as potential hazardous waste. Unburned cells are not hazardous waste. A fire with over 100 kg of cells burnt will likely require reporting to environmental officials. Always consult and obey all international, federal and local environmental laws.

### SECTION 7: HANDLING AND STORAGE

**Handling**

Use only approved charging equipment. Do not disassemble battery or battery pack. Do not puncture, crush or dispose of in fire.

**Storage**

Store in a cool, dry place away from sparks and flame. Keep below 125°C. Keep above -60°C. Charge between 0°C and 45°C.

### SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

| Chemical Name | OSHA PEL               | ACGIH TLV              | Cali. Prop 65 Reg. | IARC/NTP |
|---------------|------------------------|------------------------|--------------------|----------|
| Aluminum Foil | TWA 5mg/m <sup>3</sup> | TWA 5mg/m <sup>3</sup> | N                  | N        |
| Biphenyl (BP) | N/A                    | N/A                    | N                  | N        |
| Copper Foil   | N/A                    | N/A                    | N                  | N        |



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|                                                   |     |     |   |   |
|---------------------------------------------------|-----|-----|---|---|
| Linear & Cyclic Carbonate solvents                | N/A | N/A | N | N |
| Graphite Powder/Carbon                            | N/A | N/A | N | N |
| Metal Oxide or other Electrolyte (proprietary)    | N/A | N/A | N | N |
| Lithium Hexafluorophosphate (LiPF <sub>6</sub> )  | N/A | N/A | N | N |
| Polyvinylidene Fluoride (PVDF)                    | N/A | N/A | N | N |
| Styrene Butadiene Rubber (SBR)                    | N/A | N/A | N | N |
| Aluminum, Steel, Nickel and other inert materials | N/A | N/A | N | N |

**Eye Protection:**

Not necessary under conditions of normal use.

**Skin Protection:**

Not necessary under conditions of normal use.

**Respiratory Protection:**

Not necessary under conditions of normal use.

**Engineering Controls:**

Not necessary under conditions of normal use.

**General Hygiene Considerations:**

Not necessary under conditions of normal use.

**Exposure Controls:**

Not necessary under conditions of normal use.

### SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Data represent typical values and are not intended to be specifications.

|                                |          |                                               |                                                     |
|--------------------------------|----------|-----------------------------------------------|-----------------------------------------------------|
| <b>Physical state:</b>         | Solid    | <b>Viscosity:</b>                             | N/A                                                 |
| <b>Colour:</b>                 | N/A      | <b>Upper Explosive Limits (vol % in air):</b> | N/A                                                 |
| <b>Odor:</b>                   | Odorless | <b>Lower Explosive Limits (vol % in air):</b> | N/A                                                 |
| <b>Odor Threshold:</b>         | N/A      | <b>Vapor pressure:</b>                        | N/A                                                 |
| <b>pH:</b>                     | N/A      | <b>Vapor density:</b>                         | N/A                                                 |
| <b>Melting/Freezing Point:</b> | N/A      | <b>Relative density:</b>                      | N/A                                                 |
| <b>VOC Content:</b>            | N/A      | <b>Solubility:</b>                            | N/A                                                 |
| <b>Boiling Point:</b>          | N/A      | <b>Partition Coefficient:</b>                 | N/A                                                 |
| <b>Flash Point:</b>            | N/A      | <b>Auto-ignition Temperature:</b>             | N/A                                                 |
| <b>Evaporation Rate:</b>       | N/A      | <b>Decomposition Temperature:</b>             | N/A                                                 |
| <b>Specific Gravity:</b>       | N/A      | <b>Flammability (solid, gas):</b>             | Organic components will burn if cell is incinerated |



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### SECTION 10: STABILITY AND REACTIVITY

**Incompatible Materials:**

Water, heat and strong acids.

**Decomposition products may include:**

Hydrogen Fluoride, Phosphorus Oxides, Carbon Monoxide, Carbon Dioxide, Lithium Hydroxide, Manganese Oxides, Aluminum Oxide, possible fluoro-compounds, Carbon soot.

**Conditions to Avoid:**

Do not crush, puncture, incinerate, immerse in water or heat over 212°F (100°C). Steel casing slowly dissolves in strong mineral acids.

**Polymerization:**

Hazardous polymerization will not occur. Spontaneous decomposition will not occur at normal temperature.

**Chemical Stability:**

This product is stable.

**Reactivity:**

Hazardous polymerization will not occur. Spontaneous decomposition will not occur at normal temperature.

### SECTION 11: TOXICOLOGICAL INFORMATION

**Routes of Exposure****Inhalation, Eye and Skin contact:**

Eye contact, skin contact, skin absorption, inhalation only if burned. Hydrofluoric acid is extremely corrosive. Contact with hydrogen fluoride fumes is to be avoided. Permissible exposure limit is 3ppm. In case of contact with hydrogen fluoride fumes, immediately leave the area and seek first aid and emergency medical attention. Symptoms may have delayed onset. Fluoride ions penetrate skin readily causing destruction of deep tissue layers even bone. Fluoride interferes with nerve impulse conduction causing severe pain or absence of sensations. Immediately flush eyes or skin with water for at least 20 minutes to neutralize the acidity and remove some fluoride. Remove and destroy all contaminated clothing and permeable personal possessions. Before re-use, impermeable possessions should be soaked in benzalkonium chloride after washing. Following flushing of the affected areas, an iced aqueous solution of benzalkonium chloride or 2.5% calcium gluconate gel should be applied to react with the fluoride ion. Compresses and wraps may be used for areas where immersion is not practical. Medicated dressing should be changed every 2 minutes. Exposure to hydrofluoric acid fumes sufficient to cause pain requires immediate hospitalization for monitoring for pulmonary edema.

### SECTION 12: ECOLOGICAL INFORMATION

**Ecotoxicological Information:**

None in routine handling of product.

**Toxicity:**

No data available.

**Persistence and Degradability (Biopersistence & Biodegradability):**

None in routine handling of product.

**Potential of Bioaccumulation:**

None in routine handling of product.



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### **Mobility in Soil:**

None in routine handling of product.

### **SECTION 13: DISPOSAL CONSIDERATIONS**

Dispose in accordance with appropriate regulations. Always consult and obey all international, federal, provincial/state and local hazardous waste disposal laws. Some jurisdictions require recycling of this spent product. Battery recycling is encouraged. Lithium ion batteries are safe for disposal in the normal municipal waste stream since they are not defined by the federal government as hazardous waste. However, Lithium ion batteries are recyclable.

This product does not contain mercury, cadmium or Lithium (metal).

**DO NOT INCINERATE** or subject battery cells to temperatures in excess of 212°F (100°C).

### **SECTION 14: TRANSPORT INFORMATION**

#### **U.S. DOT Hazardous Material Regulations (Ground Transport)**

##### **Proper Shipping Description:**

UN3480 Lithium-ion batteries; UN3481 Lithium-ion batteries packed with or contained in equipment; Class 9.

Lithium-ion batteries are to be shipped in compliance with relevant requirements of HMR “49 CFR173.185”.

#### **Canada Transport Dangerous Goods (Ground Transport)**

##### **Proper Shipping Description:**

UN3480 Lithium-ion batteries; UN3481 Lithium-ion batteries packed with or contained in equipment; Class 9.

Lithium-ion batteries are to be shipped in compliance with relevant requirements of TDG “Part 2” (Section 2.43), or TDG “Schedule 2” (Special Provision 34), as applicable.

#### **International Dangerous Goods Regulations (Air, Sea, Ground Transport)**

##### **Proper Shipping Description:**

UN3480 Lithium-ion batteries; UN3481 Lithium-ion batteries packed with or contained in equipment; Class 9.

Lithium-ion batteries are to be shipped in compliance with relevant requirements of the following DG Regulations:

- ICAO Technical Instructions or IATA Dangerous Goods Regulations (59th Edition): Packing Instructions 965; 966; 967 (Section I, or Section II, as applicable).
- IMDG Code: Packing Instruction P903, or Special Provision 188, as applicable.
- UN Model Regulations on the Transport of Dangerous Goods: Packing Instruction P903, or Special Provision 188, as applicable.
- UN European Agreements (ADR/RID/ADN): Packing Instruction P903, or Special Provision 188, as applicable.
- Australian Dangerous Goods (ADG): Packing Instruction P903, or Special Provision 188, as applicable.

**IMPORTANT:** The proper classification, packaging, labeling, marking, and documentation requirements for shipping Lithium-ion batteries is dependent upon whether the particular batteries are:

- a. Rated at 100 Watt-hours (Wh) or less; or
- b. Rated at greater than 100Wh.



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Generally, Lithium-ion batteries rated 100Wh or less are “excepted” from certain Class 9 DG requirements. Always check compliance of Lithium-ion battery consignments against the current regulations governing the chosen mode of transport. When in doubt, contact the carrier or other trained Dangerous Goods professional to confirm acceptability.

### **UN 38.3 Battery Transportation Testing:**

Robert Bosch Tool Corporation rechargeable Lithium-ion batteries listed in Section 1 have passed the relevant transportation test requirements as described in the UN Manual of Tests and Criteria, Part III, section 38.3.

UN 38.3 Test Reports are maintained on file at the corporate headquarters of Robert Bosch Tool Corporation located at 1800 W. Central Road, Mount Prospect, IL, USA 60056.

## **SECTION 15: REGULATORY INFORMATION**

### **Global Inventories**

|                               |                                                                                                                                                       |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>TSCA: United States</b>    | See Sec. 14. Compliant with, relevant transportation test requirements as described in the UN Manual of Tests & Criteria, Part III, Sub-section 38.3. |
| <b>DSL: Canada</b>            | See Sec. 14. Compliant with, relevant transportation test requirements as described in the UN Manual of Tests & Criteria, Part III, Sub-section 38.3. |
| <b>ECL: Korea</b>             | Compliant with, relevant transportation test requirements as described in the UN Manual of Tests & Criteria, Part III, Sub-section 38.3.              |
| <b>PICCS: Philippines</b>     | Compliant with, relevant transportation test requirements as described in the UN Manual of Tests & Criteria, Part III, Sub-section 38.3.              |
| <b>ENCS: Japan</b>            | Compliant with, relevant transportation test requirements as described in the UN Manual of Tests & Criteria, Part III, Sub-section 38.3.              |
| <b>AICS: Australia</b>        | Compliant with, relevant transportation test requirements as described in the UN Manual of Tests & Criteria, Part III, Sub-section 38.3.              |
| <b>IECS: China</b>            | Compliant with, relevant transportation test requirements as described in the UN Manual of Tests & Criteria, Part III, Sub-section 38.3.              |
| <b>EINECS: European Union</b> | Compliant with, relevant transportation test requirements as described in the UN Manual of Tests & Criteria, Part III, Sub-section 38.3.              |

### **SARA 313 Information:**

SARA Title III Section 313: This product does not contain regulated levels of any toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and 40 CFR part 372.

### **California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65)**

This product does not contain regulated levels of any toxic chemical subject to the reporting requirements of California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65)

### **WHMIS: Canadian Workplace**

This product does not contain regulated levels of any toxic chemical subject to the reporting requirements

## **SECTION 16: OTHER INFORMATION**

### **Abbreviations:**

|      |                                           |
|------|-------------------------------------------|
| TSCA | Toxic Substance Control Act               |
| ICAO | International Civil Aviation Organization |
| IMDG | International Maritime Dangerous          |
| OSHA | Occupational Safety and Health            |



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|            |                                                                                         |
|------------|-----------------------------------------------------------------------------------------|
| IARC/NTP   | International Agency for Research on Cancer/National Toxicology Program                 |
| SARA       | Superfund Amendments and Reauthorization Act of 1986                                    |
| ACGIH      | American Conference of Governmental Industrial Hygienists                               |
| NIOSH/MSHA | National Institute for Occupational Safety Health/Mine Safety and Health Administration |
| WHMIS      | Workplace Hazardous Materials Information System                                        |

The batteries referenced herein are considered exempt articles and are not subject to the OSHA Hazard Communication Standard; therefore a SDS is not required. This sheet is being provided as a service to our customers.

Although Robert Bosch Tool Corporation has attempted to provide current and accurate information herein, Robert Bosch Tool Corporation makes no representations regarding the accuracy or completeness of the information and assumes no liability for any loss, damage, injury of any kind, which may result from or arise out of the use of or reliance on the information by any person.

It shall be the responsibility of the customer purchasing this product to ensure that all employees/users of this product are familiar with and trained in the handling, use and hazards associated with this product as contained herein. This responsibility shall also extend directly to the user.