

**MATERIAL SAFETY DATA SHEET**

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**BB-2590/U**

Effective Date: 01 Jan 2014

[includes Models BT-70791A, BT-70791B, BT-70791E, BT-70791F, BT-70791G, BT-70791BE, BT-70791BG, BT-70791BGHT, BT-70791BK, BT-70791BK( ), BT-70791CE, BT-70791CG, BT-70791CK, BT-70791CK( ), BT-70791JE]

**1. Product Identification**

**Product Name:** Lithium Ion Battery  
**Chemical System:** Lithium-Ion (Carbon/Lithiated Metal Oxide)  
**NSN:** 6140-01-490-4316 (or pending per model Model #)  
**Nominal Weight:** 3.2 lbs, (1.45 kg)  
**Nominal Voltage:** 28.8V, (two 14.4V sections)

**2. Composition/Information on Ingredients**

Although the chemical composition of the various cell manufacturers is proprietary, the following is typical of the chemistry.

Hazardous Components (Specific Chemical Identity; Common Name(s))	%	CAS Number	LD <sub>50</sub> (mg/kg) (oral-rat)	LC (mg/L)
Aluminum foil	0.1-1 w/w	7429-90-5	N/AV	A/AV
Biphenyl (BP)	0 -0.3 w/w	92-52-4	2400	N/AV
Copper foil	0.1 -0.3 w/w	7440-50-8	3.5(ipr-mouse)	N/AV
Dioxathiolane 2,2-Dioxide (DTD)	0 -3 w/w	1072-53-3	1600	N/AV
Linear and Cyclic Carbonic Solvents (See other information)	5 -17 w/w	N/APP	≈11000 (weighted avg)	N/AV
Graphite Powder	10-30 w/w	7440-44-0	440 (ivn-mouse)	N/AV
Lithium Carbonate	0 -0.3 w/w	554-13-2	525	N/APP
Lithium cobaltite (LiCoO <sub>2</sub> )	01-3- w/w	12190-79-3	N/AV	N/AV
Lithium hexafluorophosphate (LiPF <sub>6</sub> )	1-5 w/w	21324-40-3	1702	Rat: >20
Poly (vinylidene fluoride) (PVDF)	0.1 -1 w/w	24937-79-9	N/AV	N/AV
Propane Sultone (PS)	0-3 w/w	1120-71-4	100	N/AV
Steel, nickel and inert polymer	Balance	N/APP	N/APP	N/APP

These chemicals and metals are contained in a sealed can.

### 3. Hazards Identification

#### Routes of Entry:

Inhalation?	Not anticipated. Respiratory (and eye) irritation may occur if fumes are released due to heat or an abundance of leaking batteries.
Skin?	Yes
Ingestion?	Yes

#### Potential Health Effects:

These chemicals are contained in a sealed can. Risk of exposure occurs only if the battery is mechanically or electrically abused. The most likely risk is acute exposure when a cell vents. Propylene Carbonate is mildly irritating upon eye and skin contact. Contact of electrolyte and extruded lithium with skin and eyes should be avoided. Inhalation or ingestion of lithium trifluoromethane sulfonate may be harmful.

#### Signs/Symptoms of Exposure:

Skin and eye irritation may occur following exposure to a leaking battery.

#### Medical Conditions Generally Aggravated by Exposure:

An acute exposure will not generally aggravate any medical condition.

### 4. First Aid Measures

#### Emergency & First Aid Procedures:

If battery is leaking and material contacts eyes, flush with copious amounts of clear, tepid water for thirty (30) minutes, exposed skin for at least fifteen (15) minutes. Contact Physician at once. Leaking contents may be irritating to respiratory passages. Remove to fresh air. Contact physician if irritation persists. If ingested, rinse mouth and surrounding area with clear, tepid water for at least fifteen (15) minutes. Consult physician immediately for treatment and to rule out involvement of the esophagus and other tissues.

### 5. Fire Fighting Measures

#### Extinguishing Media:

Water spray, Carbon Dioxide, dry chemical powder or appropriate foam. Use agent appropriate for surrounding materials

#### Special Fire Fighting Procedures:

If large quantities are burning, wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

#### Unusual Fire and Explosion Hazards:

Organic components will burn if cell incinerated. Combustion of cell contents will cause evolution of extremely corrosive Hydrogen Fluoride gas.

### 6. Accidental Release Measures

#### Ventilation:

None under normal use conditions.

#### Protective Gloves:

None under normal use conditions. Use butyl gloves when handling leaking batteries.

#### Eye Protection:

None under normal use conditions. Wear safety glasses when handling leaking batteries.

## 7. Handling and Storage

### Precautions to be Taken in Handling and Storage:

Store batteries in a cool (below 70° F), dry area that is subject to little temperature changes. Do not place near heating equipment, nor expose to direct sunlight for long periods. Elevated temperatures can result in reduced battery service life.

### Other Precautions:

Do not disassemble battery or battery pack. Do not puncture, crush or dispose of in fire.

## 8. Exposure Controls/Personal Protection

### Steps to be Taken in Case Material is Released or Spilled:

Notify safety personnel of large spills. Evacuate the area and allow vapors to dissipate. Increase ventilation. Avoid eye or skin contact. **DO NOT** inhale vapors. Clean up personnel should wear appropriate protective gear. Remove spilled liquid with absorbent and contain for disposal.

Transport containers 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 offices. Always consult and obey all international, federal and local environmental laws.

## 9. Physical and Chemical Properties

### Appearance:

Rectangular box shape

## 10. Stability and Reactivity

### Stability:

Stable

### Conditions to Avoid:

Do not heat, crush, disassemble, short-circuit.

### Hazardous Decomposition or By-products:

Thermal degradation may produce hazardous fumes of manganese and lithium; hydrofluoric acid; oxides of carbon and sulfur and other toxic by-products.

### Hazardous Polymerization:

Will not occur.

### Incompatible Materials:

Contents incompatible with strong oxidizing agents.

## 11. Toxicological Information

<b>Carcinogenicity:</b>	<b>NTP?</b>	<b>IARC Monograph?</b>	<b>OSHA Regulated?</b>
	No	No	No

## 12. Ecological Information

N/A

## 13. Disposal Considerations

Batteries must be completely discharged prior to disposal and/or the terminals must be taped or capped to prevent short circuit.

Disposal of large quantities of batteries containing lithium cells may be subject to Federal, State or local regulations.

## 14. Transport Information

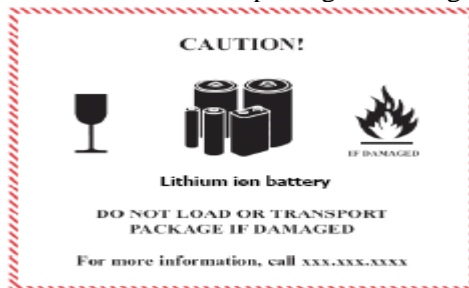
**Transportation:** This lithium-ion battery is regulated as a Class 9 Miscellaneous hazardous material (dangerous goods). The UN number for the U.S. is UN 3090; International is UN 3480. Equivalent Lithium Content, (ELC), per battery is 24.5g max. The Watt-hour rating is 294 Wh max. The battery and component cells conform to the requirements of Section 38.3 of the UN Manual of Tests & Criteria, (T1-T8 tests). Transport according to:

### **Domestic Transportation within the U.S. via ground only (motor vehicle, rail car)**

#### **See 49 CFR Section 172.102: Special Provision 189**

Battery is “excepted” from Class 9 hazardous materials regulations when shipped via ground. Battery must be packaged in a manner to prevent short circuits and in a strong outer package with the following marking: “LITHIUM BATTERIES - FORBIDDEN FOR TRANSPORT ABOARD AIRCRAFT AND VESSEL” (with letters 0.25” ht minimum).

Additionally, for quantities 13 and larger in outer package: maximum gross weight of the package is 30kg (66lbs) and the package must be capable of being dropped 1.2 meters in any orientation without damage to the cells or batteries and without causing a battery short circuit or release of package contents. Package must be marked to indicate it contains lithium batteries and that special procedures should be followed in the event that the package is damaged, (“LITHIUM ION BATTERY” caution label shown below can be used). Shipment also must be accompanied by a document indicating that the package contains lithium batteries and that special procedures should be followed if the package is damaged.



- Label dimensions: 120 x 110 mm (4.75" x 4.35") or 74 X 105 mm (2.9" x 4.13") if package cannot accommodate larger label
- Border color: Red on a contrasting background
- Pictogram colors: Glass, batteries, and flame can be black
- Label also can be used to comply with 49 CFR and IMDG Code

### **Domestic Transportation within the U.S. via air or cargo vessel. See 49 CFR 173.185(a)**

Batteries must be shipped as Class 9 Miscellaneous hazardous material (dangerous goods) with required UN specification packaging, labels, marking, shipper’s declaration for dangerous goods, and emergency response information. Shipping employees must be trained in accordance with 49 CFR requirements. Proper shipping classification is UN 3090, Lithium ion batteries, Class 9, Packing Group II.. Maximum gross weight of the package authorized is 35kg (77lbs) for cargo air transport; no limit for vessel. See also UN 3091 for Lithium ion batteries “packed with” or “contained in” equipment. (Note: Use of UN 3480 & UN 3481 is allowed in the U.S. now).

### **International Transportation: All Modes - ADR, IMDG Code, IATA Dangerous Goods Regulations and ICAO Technical Instructions (Section 1A in Packing Instruction 965):**

Batteries must be shipped as Class 9 Dangerous Goods with required UN specification packaging, labels, marking, shipper’s declaration for dangerous goods, and emergency response information. Shipping employees must be trained in accordance with Int’l requirements. Proper shipping classification is UN 3480, Lithium ion batteries, Class 9, Packing Group II. Maximum net weight of the package is 35kg (77 lbs) for cargo air transport; no limit for vessel or ground. See also UN 3481 for Lithium ion batteries “packed with” or “contained in” equipment.

## 15. Regulatory Information

Batteries are considered to be “articles” and thus are exempt from TSCA regulation.

## 16. Other Information

Avoid mechanical or electrical abuse. **DO NOT** short circuit or install incorrectly. Batteries may explode, pyrolyze or vent if disassembled, crushed, recharged incorrectly or exposed to high temperatures. Install batteries in accordance with equipment instructions.

This information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. Bren-Tronics, Inc. makes no warranty, expressed or implied, regarding the accuracy of the data or the results to be obtained from the use thereof.