

Article Information Sheet (AIS)
Formerly known as MSDS/PSDS document for Shippers

This Article Information Sheet (AIS) provides relevant battery information to retailers, consumers, OEMs and others users requesting a GHS-compliant SDS. Articles, such as batteries, are exempt from GHS SDS classification criteria. The GHS criteria is not designed or intended to be used to classify the physical, health and environmental hazards of an article. Branded consumer batteries are defined as electro-technical devices. The design, safety, manufacture, and qualification of branded consumer batteries follow ANSI and IEC battery standards. This document is based on principles set forth in the following hazard communication approaches: ANSI Z-400.1, GHS, JAMP AIS, and IEC 62474.

1. Document Information

Document Name	Duracell Alkaline Batteries (Major and Specialty Cells)
Document ID	AIS-ALK
Issue Date	1-May-15
Preparer	Product Safety & Regulatory
Last Revision	7/22/2016
Information Contact	moquet.l@duracell.com

2. Company Information

Name & Address	Duracell US Operations, Inc., 14 Research Drive, Bethel, CT USA 06801
Telephone	(203) 796- 4430
Website	www.duracell.com
Consumer Relations	North America: 1-800-551-2355 (9:00 AM - 5:00 PM EST)

3. Article Information

Description	Duracell branded consumer alkaline battery
Product Category	Electro-technical device
Use	Portable power source for electronic devices
Global sub-brands (Retail)	Coppertop, Plus, Quantum, Simply, Turbo, Ultra, Basic, TurboMax
Global sub-brands (B2B)	Procell, Industrial, OEM/OEA
Major Cells - Sizes/Part Numbers	(AA) MN/MX 1500; (AAA) MN/MX 2400; (AAAA) MN/MX 2500; (C) MN/MX 1400; (D) MN/MX 1300; (9V) MN/MX1604
Specialty Cells - Sizes/Part Numbers	MN11, MN21, MN27, MN175, PX76 (LR44), PX28, PX625, (LR09), LR43, LR54, N, J, 4.5V, 625A
Lanterns - Part Numbers	MN903, MN908, MN915, MN918; MN1203
Principles of Operation	A battery powers a device by converting stored chemical energy into electrical energy.

Representative Product Images



Major Cells Major Cells Lantern Specialty

4. Article Construction

Applicable Battery Industry Standards	ANSI C18.1M Part 1, ANSI C18.1M Part 2, ANSI C18.4, IEC 60086-1, IEC 60086-2, IEC 60086-5
Electro-technical System	Alkaline Manganese Dioxide
Electrode - Negative	Zinc (CAS # 7440-66-6); 10-25%
Electrode - Positive	Manganese Dioxide (CAS # 1313-13-9); 35-40%
Electrolyte	Alkali Metal Hydroxide (aqueous potassium hydroxide - CAS # 1310-58-3); 5-10%
Materials of Construction - Can	Nickel Plated Steel
Declarable Substances (IEC 62474 Criteria 1)	None
Mercury Free Battery (ANSI C18.4M <5ppm)	Yes
Small Cell or Battery (ANSI C18.1M Part 2; IEC 60086-5)	Sizes: AAA and Specialty Cells fit inside a specially designed test cylinder 2.25 inches (57.1mm) long by 1.25 inches (31.70 mm) wide.

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5. Health & Safety

Ingestion/Small Parts Warning

Required for Small Cell or Battery (Sizes: AAA and Specialty Cells): Keep away from children. If swallowed, consult a physician immediately.

Normal Conditions of Use

Exposure to contents inside the sealed battery will not occur unless the battery leaks, is exposed to high temperatures, or is mechanically abused.

Note to Physician

A damaged battery will release concentrated and caustic potassium hydroxide.

First Aid - If swallowed

Do not induce vomiting. Seek medical attention immediately. USA CALLS ONLY - CALL 24-HOUR NATIONAL BATTERY INGESTION HOTLINE: (202) 625-3333 - COLLECT.

First Aid - Eye Contact

Flush with water for at least 15 minutes. Seek medical care if irritation persists.

First Aid - Skin Contact

Remove contaminated clothing. Wash skin with soap and water. Seek medical care if irritation persists.

First Aid - Inhalation

Remove to fresh air.

Battery Safety Standards & Testing

Duracell batteries meet the requirements of ANSI C18. 1M Part 2 and IEC 60086-5. These standards specify tests and requirements for alkaline batteries to ensure safe operation under normal use and reasonably foreseeable misuse. The test regimes assess three conditions of safety. These are:

1-Intended use simulation: Partial use, vibration, thermal shock, and mechanical shock

2-Reasonably foreseeable misuse: Incorrect installation, external short-circuit, free fall (user-drop), over-discharge, and crush

3-Design consideration: Thermal abuse, mold stress

Precautionary Statements

CAUTION: Batteries may explode or leak, and cause burn injury, if recharged, disposed of in fire, mixed with a different battery type, inserted backwards or disassembled. Replace all used batteries at the same time. Do not carry batteries loose in your pocket or purse. Do not remove the battery label. Keep small batteries (i.e., AAA) away from children. If swallowed, consult a physician at once.

6. Fire Hazard & Firefighting

Fire Hazard

Batteries may rupture or leak if involved in a fire.

Extinguishing Media

Use any extinguishing media appropriate for the surrounding area.

Fires Involving Large Quantities of Batteries

Large quantities of batteries involved in a fire will rupture and release caustic potassium hydroxide. Firefighters should wear self-contained breathing apparatus and protective clothing.

7. Handling & Storage

Handling Precautions

Avoid mechanical and electrical abuse. Do not short circuit or install incorrectly. Batteries may rupture or vent if disassembled, crushed, recharged or exposed to high temperatures. Install batteries in accordance with equipment instructions.

Storage Precautions

Store batteries in a dry place at normal room temperature. Refrigeration does not make them last longer.

Spills of Large Quantities of Loose Batteries (unpackaged)

Notify spill personnel of large spills. Irritating and flammable vapors may be released from leaking or ruptured batteries. Spread batteries apart to stop shorting. Eliminate all ignition sources. Evacuate area and allow vapors to dissipate. Clean-up personnel should wear appropriate PPE to avoid eye and skin contact and inhalation of vapors or fumes. Increase ventilation. Carefully collect batteries and place in appropriate container for disposal. Remove any spilled liquid with absorbent material and contain for disposal.

8. Disposal Considerations (GHS Section 13)

Collection & Proper Disposal

Dispose of used (or excess) batteries in compliance with federal, state/provincial and local regulations. Do not accumulate large quantities of used batteries for disposal as accumulations could cause batteries to short-circuit. Do not incinerate. In countries, such as Canada and the EU, where there are regulations for the collection and recycling of batteries, consumers should dispose of their used batteries into the collection network at municipal depots and retailers. They should not dispose of batteries with household trash.

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USA EPA RCRA (40 CFR 261) Classified as non-hazardous waste (not ignitable, corrosive, reactive or toxic). Federal Universal Waste Regulations (40 CFR 273) do not apply. State requirements may be more stringent than Federal.

California Universal Waste Rule (Cal. Code Regs. Title 22, Div. 4.5, Ch. 23) California prohibits disposal of batteries as trash (including household trash).

9. Transport Information (GHS Section 14)

Regulatory Status Not regulated. Alkaline batteries (sometimes referred to as "Dry Cell" or "household" batteries) are not listed or regulated as dangerous goods under IATA Dangerous Goods Regulations, ICAO Technical Instructions, IMDG Code, UN Model Regulations, U.S. Hazardous Materials Regulations (49 CFR), and UNECE ADR.

UN Identification Number/ Shipping Name None - Not Required

Special Provision (SP) Conformance Special regulatory provisions require batteries to be packaged in a manner that prevents the generation of a dangerous quantity of heat and short circuits. Shippers can prepare batteries by taping the terminals, individually packaging batteries, or otherwise segregating the batteries to prevent risk of creating a short circuit. Batteries shipped in original unopened Duracell packaging is compliant.

US DOT SP 49 CFR 172.102 Special Provision 130
Air Transport (IATA/ICAO) SP Special Provision A123 (57th Edition - 2016). NOTE: The words "NOT RESTRICTED" and "SPECIAL PROVISION A123" must be included on the description of the substance on the Air Waybill, when air way-bill is issued.

International Maritime Dangerous Goods (IMDG) Not regulated/No requirements

Passenger Air Travel No restrictions

Emergency Transportation Hotline

CHEMTREC 24-Hour Emergency Response Hotline
Within the United States call +703-527-3887
Outside the United States, call +1 703-527-3887 (Collect)

10. Regulatory Information (GHS Section 15)

10a. Battery Requirements

USA EPA Mercury Containing & Rechargeable Battery Management Act of 1996 During the manufacturing process, no mercury is added.

EU Battery Directive 2006/66/EC & amendment 2013/56/EU Compliant with marking and substance restrictions for mercury (<0.0005%); cadmium (<0.0020%) and lead (<0.0040%). Global labels are marked with the special collection symbol and the EU qualifier in accordance with EU Battery Directive 2006/66/EC, Article 11, Paragraph 1 on batteries and accumulators and waste batteries and accumulators (Annex II).

P.R.C. Provision on Mercury Content Limitation for Batteries (GB 8897.5-2005, MOD, Section 9.1(e))



P.R.C Mercury Free Battery (GB 24427-2009) < 1 ppm Yes

10b. General Requirements

USA CPSIA 2008 (PL. 11900314) Exempt

USA CPSC FHSA (16 CFR 1500) Consumer batteries are not listed as a hazardous product.

USA EPA TSCA Section 13 (40 CFR 707.20) For customs clearance purpose, batteries are defined as an "Article".

USA EPA RCRA (40 CFR 261) Classified as non-hazardous waste (not ignitable, corrosive, reactive or toxic). Federal Universal Waste Regulations (40 CFR 273) do not apply. State requirements may be more stringent than Federal.

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California Prop 65	No warning required per 3rd party assessment.
CANADA Products Containing Mercury Regulations SOR/20140254	Mercury free
EU REACH SVHC's (169 Substances) Candidate List June 2016)	No listed substances are present (>0.01% w/w)
EU REACH Article 31	SDS is not required consumer alkaline batteries.
10c. Regulatory Definitions - Articles	
USA OSHA	29 CFR 1910.1200(b)(6)(v)
USA TSCA	40 CFR 704.3; 710.2(3)(c); and [19 CFR 12.1209a]
EU REACH	Title 1 - Chapter 2 - Article 3(3)
GHS	Section 1.3.2.1
11. Other Information	
11a. Certification & 3rd Party Approvals	
UL (UTGT2.S50939 Single Multiple Station Smoke Alarms - Component)	AA, 9V Certification Standard: ANSI/UL 217 Single & Multiple Station Smoke Alarms
11b. AIS Hazard Communication Approaches (consulted in developing this document):	
Globally Harmonized System (GHS)	GHS SDS requirements and classification criteria do not apply to articles or products (such as batteries) that have a fixed shape, which are not intended to release a chemical. The article exemption is found in Section 1.3.2.1.1 of the GHS and reads: <i>The GHS applies to pure substances and their dilute solutions and to mixtures. "Articles" as defined by the Hazard Communication Standard (29 CFR 1900.1200) of the OSHA of the USA, or by similar definition, are outside the scope of the system.</i>
Joint Article Management Promotion Consortium JAMP	JAMP is a Japanese Industry Association who developed the concept of an Article Information Sheet as a supply chain tool to share and communicate chemical information in articles. The AIS authoring process is based on "declarable" substances to meet global regulatory requirements as well as substances to be reported by GADSL, JIG, etc.
IEC 62474 Ed. 1.0 B:2012 Material Declaration for Products of and for the Electro-technical Industry	An international standard that came into effect in March 2012 concerning declaration for electrical and electronic products. IEC 6274 replaces the defunct Joint Industry Guide – Material Declaration for Electro-technical Products (JIG-101-Ed 4.1 (May 21, 2012)
IEC 62474 Database - Publically available online (maintained by TC11: Environmental Standardization for electrical and electronic products and systems.	The general principle for a substance to be included in the database as a declarable substance is: 1) existing national laws or regulations in an IEC member country that are relevant to Electro-technical products and that prohibit or restrict substances, or that have a labeling, communication, reporting or notification requirement, and 2) applying IEC 62474 criteria results in identification of declarable substance.
ANSI Z 400.1/Z19.1 (2010)	2.1 Scope: Applies to preparation of SDSs for hazardous chemicals used under occupational conditions. Does not address how the standard may be applied to articles. It presents basic information on how to develop and write a SDS. Additional information is provided to help comply with state and federal environmental and safety laws and regulations. Elements of the standard may be acceptable for International use.

DISCLAIMER: This AIS is intended to provide a brief summary of our knowledge and guidance regarding the use of this material. The information contained here has been compiled from sources considered by Duracell to be dependable and is accurate to the best of the Company's knowledge. It is not meant to be an all-inclusive document on worldwide hazard communication regulations. This information is offered in good faith. Each user of this material needs to evaluate the conditions of use and design the appropriate protective mechanisms to prevent employee exposures, property damage or release to the environment. Duracell assumes no responsibility for injury to the recipient or third persons or for any damage to any property resulting from misuse of the product.

PRODUCT SAFETY DATA SHEET

PRODUCT NAME: Energizer Battery

Type No: 123, 1CR2, 223, 2CR5, 2L76, CRV3, LA522, L522

Volts:
3.0, 9.0

TRADE NAMES: Cylindrical Lithium Manganese Dioxide Batteries

Approximate Weight: 11 – 40 g.

CHEMICAL SYSTEM: Lithium Manganese Dioxide

Designed for Recharge: No

Document Number: 12004-A

Energizer has prepared copyrighted Product Safety Datasheets to provide information on the different Eveready/Energizer battery systems. Batteries are articles as defined under the GHS and exempt from GHS classification criteria (Section 1.3.2.1.1 of the GHS). The information and recommendations set forth herein are made in good faith, for information only, and are believed to be accurate as of the date of preparation. However, ENERGIZER BATTERY MANUFACTURING, INC. MAKES NO WARRANTY, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO THIS INFORMATION AND DISCLAIMS ALL LIABILITY FROM REFERENCE ON IT.

SECTION 1 - MANUFACTURER INFORMATION

Manufactured for
Energizer Battery Manufacturing, Inc.
25225 Detroit Rd.
Westlake, OH 44145

Telephone Number for Information:
800-383-7323 (USA / CANADA)

Date Prepared: January 2017

SECTION 2 - HAZARDS IDENTIFICATION

GHS classification: N/A

Signal Word: N/A

Hazard Classification: N/A

Under normal conditions of use, the battery is hermetically sealed.

Ingestion: Swallowing a battery can be harmful.

Inhalation: Contents of an open battery can cause respiratory irritation.

Skin Contact: Contents of an open battery can cause skin irritation.

Eye Contact: Contents of an open battery can cause severe irritation.

SECTION 3 - INGREDIENTS

IMPORTANT NOTE: The battery should not be opened or burned. Exposure to the ingredients contained within or their combustion products could be harmful.

MATERIAL OR INGREDIENT	PEL (OSHA)	TLV (ACGIH)	%/wt.
Carbon Black (CAS# 1333-86-4)	3.5 mg/m ³ TWA	3.5 mg/m ³ TWA	0-1
1,2-Dimethoxyethane (CAS# 110-71-4)	None established	None established	0-6
1,3-Dioxolane (CAS# 646-06-0)	None established	None established	0-8
Graphite (CAS# 7782-42-5)	15 mg/m ³ TWA (total dust) 5 mg/m ³ TWA (respirable fraction)	2 mg/m ³ TWA (respirable fraction)	0-3
Lithium or Lithium Alloy (CAS# 7439-93-2)	None established	None established	1-6

Lithium Trifluoromethanesulfonate (CAS# 33454-82-9)	None established	None established	0-3
Lithium Trifluoromethanesulfonimide (CAS# 90076-65-6)	None established	None established	0-3
Manganese Dioxide (CAS# 1313-13-9)	5 mg/m ³ Ceiling (as Mn)	0.2 mg/m ³ TWA (as Mn)	12-42
Propylene Carbonate (CAS# 108-32-7)	None established	None established	0-8
Non-Hazardous Components:			
Steel (iron CAS# 65997-19-5)	None established	None established	20
Plastic and Other	None established	None established	Balance

SECTION 4 – FIRST AID MEASURES

Ingestion: Do not induce vomiting or give food or drink.

Inhalation: Provide fresh air and seek medical attention.

Skin Contact: Remove contaminated clothing and wash skin with soap and water.

Eye Contact: Immediately flush eyes thoroughly with water for at least 15 minutes, lifting upper and lower lids, until no evidence of the chemical remains. Seek medical attention.

Note: Carbon black is listed as a possible carcinogen by International Agency for Research on Cancer (IARC).

SECTION 5- FIRE FIGHTING MEASURES

In case of fire where lithium batteries are present, flood area with water or smother with a Class D fire extinguishant appropriate for lithium metal, such as Lith-X. Water may not extinguish burning batteries but will cool the adjacent batteries and control the spread of fire. Burning batteries will burn themselves out. Virtually all fires involving lithium batteries can be controlled by flooding with water. However, the contents of the battery will react with water and form hydrogen gas. In a confined space, hydrogen gas can form an explosive mixture. In this situation, smothering agents are recommended. A smothering agent will extinguish burning lithium batteries.

Emergency Responders should wear self-contained breathing apparatus. Burning lithium manganese dioxide batteries produce toxic and corrosive lithium hydroxide fumes.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

To cleanup leaking batteries:

Ventilation Requirements: Room ventilation may be required in areas where there are open or leaking batteries.

Respiratory Protection: Avoid exposure to electrolyte fumes from open or leaking batteries.

Eye Protection: Wear safety glasses with side shields if handling an open or leaking battery.

Gloves: Use neoprene or natural rubber gloves if handling an open or leaking battery.

Battery materials should be collected in a leak-proof container.

SECTION 7 - HANDLING AND STORAGE

Storage: Store in a cool, well ventilated area. Elevated temperatures can result in shortened battery life. In locations that handle large quantities of lithium batteries, such as warehouses, lithium batteries should be isolated from unnecessary combustibles.

Mechanical Containment: If potting or sealing the battery in an airtight or watertight container is required, consult your Energizer Battery Manufacturing, Inc. representative for precautionary suggestions. Do not obstruct safety release vents on batteries. Encapsulation of batteries will not allow cell venting and can cause high pressure rupture.

Handling: Accidental short circuit for a few seconds will not seriously affect the battery. Prolonged short circuit will cause the battery to lose energy, generate significant heat and can cause the safety release vent to open. Sources of short circuits include jumbled batteries in bulk containers, metal jewelry, metal covered tables or metal belts used for assembly of batteries into devices. Damaging a lithium battery may result in an internal short circuit.

The contents of an open battery, including a vented battery, when exposed to water, may result in a fire and/or explosion. Crushed or damaged batteries may result in a fire.

If soldering or welding to the battery is required, consult your Energizer representative for proper precautions to prevent seal damage or short circuit.

Charging: This battery is manufactured in a charged state. It is not designed for recharging. Recharging can cause battery leakage or, in some cases, high pressure rupture. Inadvertent charging can occur if a battery is installed backwards.

Labeling: If the Energizer label or package warnings are not visible, it is important to provide a package and/or device label stating:

WARNING: Battery can explode or leak and cause burns if installed backwards, disassembled, charged, or exposed to water, fire or high temperature.

Where accidental ingestion of small batteries is possible, the label should include:

⚠ WARNING

(1) KEEP OUT OF REACH OF CHILDREN. Swallowing may lead to serious injury or death in as little as 2 hours due to chemical burns and potential perforation of the esophagus. **Immediately see doctor; have doctor phone (202) 625-3333.** Keep in original package until ready to use. Dispose of used batteries immediately.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation Requirements: Not necessary under normal conditions.

Respiratory Protection: Not necessary under normal conditions.

Eye Protection: Not necessary under normal conditions.

Gloves: Not necessary under normal conditions.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance (physical state, color, etc.):	Solid object
Upper Explosive Limits:	Not applicable for an Article
Lower Explosive Limits	Not applicable for an Article
Odor	No odor
Vapor Pressure (mm Hg @ 25°C)	Not applicable for an Article
Odor Threshold	No odor
Vapor Density (Air = 1)	Not applicable for an Article
pH	Not applicable for an Article
Density (g/cm ³)	2.0-3.0

Melting point/Freezing Point	Not applicable for an Article
Solubility in Water (% by weight)	Not applicable for an Article
Boiling Point @ 760 mm Hg (°C)	Not applicable for an Article
Flash Point	Not applicable for an Article
Evaporation Rate (Butyl Acetate = 1)	Not applicable for an Article
Flammability	Not applicable for an Article
Partition Coefficient	Not applicable for an Article
Auto-ignition Temperature	Not applicable for an Article
Decomposition Temperature	Not applicable for an Article
Viscosity	Not applicable for an Article

SECTION 10 – STABILITY AND REACTIVITY

Lithium manganese dioxide batteries contain no sulfides or cyanides and they do not meet any other reactivity criteria including "reacts violently with water" and therefore do not meet any of the criteria established in 40 CFR 261.2 for reactivity.

SECTION 11 – TOXICOLOGICAL INFORMATION

Under normal conditions of use, lithium manganese dioxide batteries are non-toxic.

SECTION 12 – ECOLOGICAL INFORMATION

Issues such as ecotoxicity, persistence and bioaccumulation are not applicable for articles.

SECTION 13 – DISPOSAL CONSIDERATIONS

LiMnO₂ batteries are not hazardous waste per the United States Resource Conservation and Recovery Act(RCRA) - 40 CFR Part 261 Subpart C. Dispose of in accordance with all applicable federal, state and local regulations.

SECTION 14 – TRANSPORT INFORMATION

In general, all batteries in all forms of transportation (ground, air, or ocean) must be packaged in a safe and responsible manner. Regulatory concerns from all agencies for safe packaging require that batteries be packaged in a manner that prevents short circuits and be contained in "strong outer packaging" that prevents spillage of contents. All original packaging for Energizer lithium batteries are compliant with these regulatory concerns.




Energizer lithium manganese dioxide batteries are exempt from the classification as dangerous goods as they meet the requirements of the special provisions listed below. (Essentially, they are properly packaged and labeled, contain less than 1 gram of lithium and pass the tests defined in UN model regulation section 38.3).

Regulatory Body	Special Provisions
ADR	188, 230, 310, 636, 656
IMDG	188, 230, 310, 957
UN	UN 3090, UN 3091
US DOT	29, A54, A100, A101
IATA 58 th Edition, ICAO	Packaging Instructions 968 - 970
Transport Canada TDG	34

Energizer is registered with CHEMTREC. In the event of an incident during transport call 1-800-424-9300 (North America) or 1-703-527-3887 (International).

A global lithium label chart is provided below to summarize the current global labeling requirements.

Label Summary Chart

Shipping Mode	Li content	Net quantity wt. of batteries per package	Battery Type			
AIR	0.3g to ≤1g/cell 0.3g to ≤2g/ battery	≤2.5 kg	123, 1CR2, 223, 2CR5, 2L76, CRV3, LA522	YES	YES	YES
	≤0.3g/cell	≤2.5kg	All Li Coin and 2L76	NO	YES	YES
	≤0.3g/cell	>2.5kg	All Li Coin and 2L76	YES	YES	YES
Land/ Sea only	All	All	All	NO	YES	YES

SECTION 15 - REGULATORY INFORMATION

Outside of the transportation requirements noted in Section 14, lithium manganese dioxide batteries marketed by Energizer Battery Manufacturing, Inc. are not regulated.

SARA/TITLE III - As an article, this battery and its contents are not subject to the requirements of the Emergency Planning and Community Right-To-Know Act.

SECTION 16 - OTHER INFORMATION

None.

PRODUCT SAFETY DATA SHEET

PRODUCT NAME: Eveready / Energizer Battery

TRADE NAMES: ENERGIZER, ENERGIZER e³, INDUSTRIAL, EVEREADY

CHEMICAL SYSTEM: Alkaline Manganese Dioxide-Zinc

Designed for Recharge: No

Document Number: 12000-A

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25225 Detroit Rd.
Westlake, OH 44145

Telephone Number for Information:
800-383-7323 (USA / CANADA)

Date Prepared: January 2017

SECTION 2 - HAZARDS IDENTIFICATION

GHS classification: N/A

Signal Word: N/A

Hazard Classification: N/A

Under normal conditions of use, the battery is hermetically sealed.

Ingestion: Swallowing a battery can be harmful. Contents of an open battery can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract.

Inhalation: Contents of an open battery can cause respiratory irritation.

Skin Contact: Contents of an open battery can cause skin irritation and/or chemical burns.

Eye Contact: Contents of an open battery can cause severe irritation and chemical burns.

SECTION 3 - INGREDIENTS

IMPORTANT NOTE: The battery should not be opened or burned. Exposure to the ingredients contained within or their combustion products could be harmful.

MATERIAL OR INGREDIENT	PEL (OSHA)	TLV (ACGIH)	%/wt.
Graphite (CAS# 7782-42-5)	15 mg/m ³ TWA (total dust) 5 mg/m ³ TWA (respirable fraction)	2 mg/m ³ TWA (respirable fraction)	2-6
Manganese Dioxide (CAS# 1313-13-9)	5 mg/m ³ Ceiling (as Mn)	0.2 mg/m ³ TWA (as Mn)	30-45
Potassium Hydroxide (CAS# 1310-58-3)	None established	2 mg/m ³ Ceiling	4-8
Zinc (CAS# 7440-66-6)	15 mg/m ³ TWA PNOR* (total dust) 5 mg/m ³ TWA PNOR* (respirable fraction)	10 mg/m ³ TWA PNOC** (inhalable particulate) 3 mg/m ³ TWA PNOC** (respirable particulate)	12-25

Non-Hazardous Components			
Steel (Iron CAS# 65997-19-5)	None established	None established	18-22
Water, Paper, Plastic and Other	None established	None established	Balance

* PNOR: Particulates not otherwise regulated

**PNOC: Particulates not otherwise classified

SECTION 4 – FIRST AID MEASURES

Ingestion: Do not induce vomiting or give food or drink. Seek medical attention immediately. CALL NATIONAL BATTERY INGESTION HOTLINE for advice and follow-up (202-625-3333) collect day or night.

Inhalation: Provide fresh air and seek medical attention.

Skin Contact: Remove contaminated clothing and wash skin with soap and water. If a chemical burn occurs or if irritation persists, seek medical attention.

Eye Contact: Immediately flush eyes thoroughly with water for at least 15 minutes, lifting upper and lower lids, until no evidence of the chemical remains. Seek medical attention.

SECTION 5 - FIRE FIGHTING MEASURES

In case of fire, it is permissible to use any class of extinguishing medium on these batteries or their packing material. Cool exterior of batteries if exposed to fire to prevent rupture.

Fire fighters should wear self-contained breathing apparatus.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

To cleanup leaking batteries:

Ventilation Requirements: Room ventilation may be required in areas where there are open or leaking batteries.

Eye Protection: Wear safety glasses with side shields if handling an open or leaking battery.

Gloves: Use neoprene or natural rubber gloves if handling an open or leaking battery.

Battery materials should be collected in a leak-proof container.

SECTION 7 - HANDLING AND STORAGE

Storage: Store in a cool, well ventilated area. Elevated temperatures can result in shortened battery life.

Mechanical Containment: If potting or sealing the battery in an airtight or watertight container is required, consult your Energizer Battery Manufacturing, Inc. representative for precautionary suggestions. Batteries normally evolve hydrogen which, when combined with oxygen from the air, can produce a combustible or explosive mixture unless vented. If such a mixture is present, short circuits, high temperature, or static sparks can cause an ignition.

Do not obstruct safety release vents on batteries. Encapsulation (potting) of batteries will not allow cell venting and can cause high pressure rupture.

Handling: Accidental short circuit for a few seconds will not seriously affect the battery. Prolonged short circuit will cause the battery to lose energy, and can cause the safety release vent to open. Sources of short circuits include jumbled batteries in bulk containers, metal jewelry, metal covered tables or metal belts used for assembly of batteries into devices.

If soldering or welding to the battery is required, consult your Energizer Battery Manufacturing, Inc. representative for proper precautions to prevent seal damage or short circuit.

Charging: This battery is manufactured in a charged state. It is not designed for recharging. Recharging can cause battery leakage or, in some cases, high pressure rupture. Inadvertent charging can occur if a battery is installed backwards.

Labeling: If the Eveready / Energizer Battery label or package warnings are not visible, it is important to provide a package and/or device label stating:

WARNING: do not install backwards, charge, put in fire, or mix with other battery types. May explode or leak causing injury.
Replace all batteries at the same time.

Where accidental ingestion of small batteries is possible, the label should include:

Keep away from small children. If swallowed, promptly see doctor; have doctor phone (202) 625-3333 collect.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation Requirements: Not necessary under normal conditions.

Respiratory Protection: Not necessary under normal conditions.

Eye Protection: Not necessary under normal conditions.

Gloves: Not necessary under normal conditions.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance (physical state, color, etc.):	Solid object
Upper Explosive Limits:	Not applicable for an Article
Lower Explosive Limits:	Not applicable for an Article
Odor	No odor
Vapor Pressure (mm Hg @ 25°C)	Not applicable for an Article
Odor Threshold	No odor
Vapor Density (Air = 1)	Not applicable for an Article
pH	Not applicable for an Article
Density (g/cm ³)	2.0 - 3.0
Melting point/Freezing Point	Not applicable for an Article
Solubility in Water (% by weight)	Not applicable for an Article
Boiling Point @ 760 mm Hg (°C)	Not applicable for an Article
Flash Point	Not applicable for an Article
Evaporation Rate (Butyl Acetate = 1)	Not applicable for an Article
Flammability	Not applicable for an Article
Partition Coefficient	Not applicable for an Article
Auto-ignition Temperature	Not applicable for an Article
Decomposition Temperature	Not applicable for an Article
Viscosity	Not applicable for an Article

SECTION 10 - STABILITY AND REACTIVITY

Alkaline batteries do not meet any of the criteria established in 40 CFR 261.2 for reactivity.

SECTION 11 – TOXICOLOGICAL INFORMATION

Under normal conditions of use, alkaline batteries are non-toxic.

SECTION 12 – ECOLOGICAL INFORMATION

Issues such as ecotoxicity, persistence and bioaccumulation are not applicable for articles.

SECTION 13 – DISPOSAL CONSIDERATIONS

Dispose of in accordance with all applicable federal, state and local regulations. Appropriate disposal technologies include incineration and land filling.

SECTION 14 – TRANSPORT INFORMATION

In general, all batteries in all forms of transportation (ground, air, or ocean) must be packaged in a safe and responsible manner. Regulatory concerns from all agencies for safe packaging require that batteries be packaged in a manner that prevents short circuits and be contained in "strong outer packaging" that prevents spillage of contents. All original packaging for Energizer alkaline batteries has been designed to be compliant with these regulatory concerns.

Alkaline batteries (sometimes referred to as "Dry cell" batteries) are not listed as dangerous goods under the ADR European Agreement Concerning the International Carriage of Dangerous Goods by Road, the IMDG International Maritime Dangerous Goods Code, UN Dangerous Good Regulations, IATA Dangerous Goods Regulations, ICAO Technical Instructions and the U.S. hazardous materials regulations (49 CFR). These batteries are not subject to the dangerous goods regulations provided they meet the requirements contained in the following special provisions.

Regulatory Body	Special Provisions
ADR	Not regulated
IMDG	Not regulated
UN	Not regulated
US DOT	49 CFR 172.102 Provision 130
IATA	A123
ICAO	Not regulated

All Energizer alkaline batteries are packed in such a way to prevent short circuits or the generation dangerous quantities of heat and meet the special provisions listed above. In addition, the IATA Dangerous Goods Regulations and ICAO Technical Instructions require the words "not restricted" and the Special Provision number A123 be provided on the air waybill, when an air waybill is issued.

SECTION 15 - REGULATORY INFORMATION

Batteries marketed by Energizer Battery Manufacturing, Inc. are not classified as dangerous goods by the US Department of Transportation or the major international regulatory bodies and are therefore not regulated.

SARA/TITLE III - As an article, this battery and its contents are not subject to the requirements of the Emergency Planning and Community Right-To-Know Act.

SECTION 16 - OTHER INFORMATION

None.

The information contained within is provided as a service to our customers and for their information only. The information and recommendations set forth herein are made in good faith and are believed to be accurate as of the date of preparation or revision. BIPOWER makes no warranty expressed or implied, and disclaims all liabilities from reliance on it.

Section 1 – Identification**1.1 Product Name and Description:**

Battery: Lithium-ion, Rechargeable, Non-venting cells and batteries.
 Electro-chemistry: Lithium-ion (Li-ion)

This Safety Data Sheet covers all lithium ion rechargeable cells and batteries supplied by BIPOWER CORP.

1.2 Supplier**Office Address**

BIPOWER CORP.
 2560 Corporate Place, Suite D203
 Monterey Park, CA 91754
 USA

Telephone Numbers For Information

Telephone: (323) 981-9498
 Fax: (323) 981-9468
 Emergency Telephone: (323) 981-9498
 Date of Revision: January-11-2017

Section 2 – Hazard(s) Identification

The lithium ion cell/battery covered in this Data Sheet is hermetically sealed in an aluminum alloy or metal case and not hazardous if used as recommended by the manufacturer.

Under a normal condition of use, the electrode materials and electrolyte contained in a cell/battery are non-reactive provided the battery integrity is maintained. Risk of exposure exists only in case of mechanical, electrical or thermal abuse.

Warning: the cells/batteries should not be short circuited, punctured, incinerated, crushed, immersed in water, over-discharged, or exposed to a temperatures above the declared operation temperature range of the cell or battery.

Risk of fire or explosion may occur in the above condition of abuse.

Section 3 – Composition/Information on Ingredients

Chemical Name	CAS Number	EINECS Number	% by Weight
Lithium Cobalt Oxide	12190-79-3	235-362-0	25 - 35
Carbon, various forms	7440-44-0	231-153-3	10 - 30
Polymer Binders	NA	NA	0.1 - 1
Copper	7440-50-8	231-159-6	1 - 15
Aluminum	7429-90-5	231-072-3	1 - 10
Biphenyl	92-52-4	202-163-5	0.1 - 0.3
Organic Carbonates	NA	NA	5 - 10
Lithium Salts	NA	NA	1 - 6

Section 4 - First-Aid Measures

In case of battery rupture, major leakage or explosion, evacuate all workers and quarantine the contaminated area. Provide good ventilation to clear out any evacuate fumes, gases or the pungent odor.

Eyes - Rinse eyes with plenty of water for 15 minutes; Seek immediate medical attention.

Skin - Rinse affected area with plenty of water and soap or take a shower for 15 min;

Inhalation - Expose the person to fresh air and use artificial respiration if needed;
 Seek medical attention if necessary.

Ingestion - Consult a physician or local poison control center immediately;

Section 5 - Fire-Fighting Measures

Extinguishing media:

1. Dry chemical or water type extinguishers are the most effective means to extinguish a cell or battery fire.
2. A carbon dioxide (CO₂) extinguisher is also effective.

Special fire fighting procedures:

Respiratory protection: In all fire situations, wear self-contained breathing apparatus (SCBA) and chemical apron.

Skin protection: Wear full fire fighting protective clothing and equipment to prevent body contact with electrolyte solution.

Eye protection: Safety glasses are recommended.

During water application, caution is advised as burning pieces of flammable particles may be ejected from the fire.

Causes of unusual fire or explosion hazard:

Cells or batteries that are damaged, opened or exposed to excessive heat/fire may flame or leak potentially hazardous organic vapors.

Section 6 - Accidental Release Measures

Procedures to contain and clean up leaks and spills:

Under a normal condition of use, a battery is hermetically sealed and not hazardous. Leakage or release of hazardous materials contained within a battery would be possible under abusive conditions.

In the event of battery rupture and leakage: contain the spills and cover the spills or leakage with dry sand or 1:1 mixture of soda ash and slaked lime.

Rubber gloves must be used to handle all battery components.

Avoid inhalation of any vapors that may be emitted.

Damaged batteries that are not hot or burning should be placed in a sealed plastic bag or container.

Section 7 - Handling and Storage

Precautions for safe handling:

Avoid any contact with the contents in case of rupture, leakage or explosion. Follow the procedures in Section 6 to handle and dispose the spills or waste.

Batteries are designed to be recharged. However, improperly charging a cell or battery may cause the product to flame or leak. Use only approved chargers and procedures.

Never disassemble a battery or bypass any safety device.

More than a momentary short circuit will cause temporary battery voltage loss until the battery is subjected to a charge.

Extended short-circuiting creates high temperatures in the cell.

High temperatures can cause burns in skin or cause the cell to flame.

Avoid reversing battery polarity within the battery assembly. To do so may cause cell to flame or to leak.

Conditions for safe storage and incompatibility:

Batteries should be separated from other materials and stored in a non-combustible, well ventilated structure with sufficient clearance between walls and battery stacks.

Do not place batteries near heating equipment, nor expose to direct sunlight for long periods.

Do not store batteries above 60°C (140°F) or below -20°C (-4°F).

Store batteries in a cool (below 25°C (77°F)), dry area that is subject to little temperature change.

Do not store batteries in a manner that allows terminals to short circuit.

Maintain the state of charge level at 30-50% when the cell is placed in storage.

Section 8 - Exposure Controls/Personal Protection

Engineering controls and work practices:

Under conditions of normal use, batteries do not emit hazardous or regulated substances.
No engineering controls are required for handling batteries that have not been damaged.

Personal protective equipment:

Personal protective equipment should include chemical resistant gloves and safety glasses.
In the event of a fire, SCBA should be worn along with thermally protective outer garments.

Section 9 - Physical and Chemical Properties

Appearance: prismatic or cylindrical, hermetically sealed metal container.
Open Circuit Voltage (OCV): 3.7V
Charge temperature range: 0°C to +45°C
Discharge (operation) temperature range: -20°C to +60°C
Recommended storage temperature: 1 month: -20°C to +45°C; 6 months: -20°C to +35°C

Section 10 - Stability and Reactivity

Stability:	The batteries are stable under normal operation and storage conditions.
Hazardous Polymerization:	will not occur.
Materials to avoid:	water, strong acid or alkalis solutions, oxidizing agents.
Conditions to avoid:	short-circuiting, disassembling, over-discharging, heating over the declared operation temperature range of the product.
Hazardous decomposition products:	Carbon Monoxide (CO) and other VOC's

Section 11 - Toxicological Information

No toxicological impacts are expected under normal use conditions.
The electrolytes contained in this cell or battery can irritate eyes with any contact if released.
Prolonged contact of electrolytes with lung tissue, skin or mucous membranes may cause irritation.
Information regarding sensitization, carcinogenicity, mutagenicity or reproductive toxicity related to internal cell or battery components has not been included in this document.

Section 12 - Ecological Information

No ecological impacts expected under normal use conditions.
Information on the ecological impact of internal cell or battery components has not been included in this document.

Section 13 - Disposal Considerations

Do not dispose in fire or submerge in water.
Battery disposal regulations vary on national, state/provincial and local bases.
Disposal must be conducted in accordance with the applicable laws and regulations.
These batteries contain recyclable materials and recycling is encouraged over disposal.

Section 14 - Transport Information

The regulations that govern the transport of rechargeable lithium ion (including polymer) cells and batteries include the International Civil Aviation Organization (ICAO) Technical Instructions and International Air Transportation Association (IATA) Dangerous Goods Regulations and International Maritime Dangerous Goods (IMDG) Code.

The transportation of lithium ion cells and batteries of all types within, to and from the the United States are governed by US DOT CFR 49 Part 171-180 of the US Hazardous Materials Regulations (HMR). CFR 49 Part §173.185(c) and the Special Provisions contained in §172.102 provide information on exceptions and packaging based on details of Watt-hour (Wh) rating, weight, tests and classifications.

- Shipping names:** Lithium ion cells or batteries;
- UN number 3480:** Lithium ion cells or batteries;
- UN number 3481:** Lithium ion cells or batteries contained in or packed with equipment;
- Hazard classification:** Miscellaneous Class 9 (restricted to transport);
- Shipping information:** All lithium ion cells or batteries for transport must be of the type proven to meet the criteria in Part III, sub-section 38.3 of the UN Manual of Tests and Criteria.
- Packing Instructions:** Packing of lithium ion cells/batteries and batteries contained in or packed with equipment for transportation are regulated by IATA/ICAO, the 57th Edition of IATA Dangerous Goods Regulations (DGR), Packing Instructions PI965, PI966 and PI967, IMDG and ADR Code SP188, and P903/908/909, SP230/376/377.
- Label requirements:** Identification and proper labeling should comply with the applicable regulations.

Section 15 - Regulatory Information

United States

- Hazard Communication Standard (29 CFR 1910.1200): Article
- CERCLA SECTION 304 Hazardous Substances: N/A
- EPCRA SECTION 302 Extremely Hazardous Substance: N/A
- EPCRA SECTION 313 Toxic Release Inventory: N/A
- EPCRA SECTION 312: N/A
- Components Listed on US Toxic Substances Control Act (TSCA) Inventory: Yes

Europe

- Registration, Evaluation, Authorization and Restriction of Chemicals (REACH): Article
- European RoHS Directive 2008/35/EC: N/A
- European WEEE Directive 2008/34/EC: Article

Note: Applies to cells and batteries incorporated into electrical and electronic equipment, when that equipment becomes waste.

Section 16 - Other Information

The information contained herein is made in good faith and believed to be accurate by the best knowledge available to us and furnished without warranty of any kind. Users should consider this data only as a supplement to other information gathered by them and must make independent determinations of the suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers. BIPOWER CORP makes no warranty expressed or implied, and disclaims all liabilities from reliance on it.

This product is a consumer product which is used in a hermetically sealed state. So, it is not an object of the SDS system. This document is provided to customers as reference information for the safe handling of the product. The information and recommendations set forth are made in good faith and are believed to be accurate at the date of preparation. Panasonic Corporation makes no warranty expressed or implied.

PRODUCT SAFETY DATA SHEET

1 Chemical product and company identification

Name of Product : Manganese dioxide lithium battery
Name of Company : Panasonic Corporation Automotive & Industrial Systems Company
Address : 1-1 Matsushita-cho, Moriguchi-city, Osaka, 570-8511, Japan
Telephone +81-6-6994-4560
Division : Energy Device Business Division
Department : Engineering Department
Emergency Contact : Outside the United States +1-703-527-3887
(call CHMTREC) in the United States 1-800-424-9300

2 Hazards identification

GHS Classification : Not applicable
Toxicity : Vapor generated from burning batteries, may irritate eyes, skin and throat.
Hazard : Electrolyte and lithium metal are inflammable.
Risk of explosion by fire if batteries are disposed in fire or heated above 100 degrees C.
Stacking or jumbling batteries may cause external short circuits, heat generation, fire or explosion.

3 Composition/information of ingredients

Component	Material	CAS No.	Content (%)
Positive electrode	Manganese dioxide	1313-13-9	12 - 50
Negative electrode	Lithium metal	7439-93-2	0.5 - 6
Electrolyte	1,2-dimethoxyethane	110-71-4	1.5 - 3.5
	Lithium Perchlorate	7791-03-9	0.2 - 0.7
	Organic electrolyte	-	2.5 - 7
Others (Steel or Plastic parts)	Steel	7439-89-6, 7440-47-3	30 - 85
	Polypropylene	9003-07-0	0.5 - 10

Lithium content per cell

Model Number	Lithium content(g)	Model Number	Lithium content(g)	Model Number	Lithium content(g)	Model Number	Lithium content(g)
CR1025	0.008	CR1612	0.01	CR2012	0.02	CR2412	0.03
		CR1616	0.02	CR2016	0.03	CR2450	0.18
CR1216	0.008	CR1620	0.02	CR2025	0.05	CR2477	0.29
CR1220	0.01	CR1632	0.04	CR2032	0.07		
						CR3032	0.15
				CR2330	0.08		
				CR2354	0.17		

4 First aid measures (in case of electrolyte leakage from the battery)

- Eye contact : Flush the eyes with plenty of clean water for at least 15 minutes immediately, without rubbing. Get immediate medical treatment. If appropriate procedures are not taken, this may cause eye injury.
- Skin contact : Wash the contact areas off immediately with plenty of water and soap. If appropriate procedures are not taken, this may cause sores on the skin.
- Inhalation : Remove to fresh air immediately. Get medical treatment immediately.

5 Firefighting measures

- Fire extinguishing agent : Alcohol-resistant foam and dry sand are effective.
- Extinguishing method : Since vapor, generated from burning batteries may make eyes, nose and throat irritates, be sure to extinguish the fire on the windward side. Wear the respiratory protection equipment in some cases.

6 Accidental release measures (in case of electrolyte leakage from the battery)

- Take up with absorbent cloth, treat cloth as inflammable.
- Move the battery away from the fire.

7 Handling and storage

Handling

- : • When packing the batteries, do not allow battery terminals to contact each other, or contact with other metals. Be sure to pack batteries by providing partitions in the packaging box, or in a separate plastic bag so that the single batteries are not mixed together.
- Use strong material for packaging boxes so that they will not be damaged by vibration, impact, dropping and stacking during their transportation.
- Do not short-circuit, recharge, deform, throw into fire or disassemble.
- Do not mix different type of batteries.
- Do not solder directly onto batteries.
- Insert the battery correctly in electrical equipment.

Storage

- : • Do not let water penetrate into packaging boxes during their storage and transportation.
- Do not store the battery in places of the high temperature or under direct sunlight.
- Please also avoid the places of high humidity. Be sure not to expose the battery to condensation, rain or frozen condition

8. Exposure controls and personal protection

Acceptable concentration : Not specified about Lithium Battery.

Facilities : Nothing in particular.

Protective Equipment (in case of electrolyte leakage from the battery)

Respiratory Protection : Self-Contained Breathing Apparatus for organic gases

Hand Protection : Safety gloves.

Eye Protection : Safety goggle

9. Physical and chemical properties

Appearance : Coin shape

Nominal Voltage : 3 V

10. Stability and reactivity

Since batteries utilize a chemical reaction they are actually considered a chemical product.

As such, battery performance will deteriorate over time even if stored for a long period of time without being used. In addition, the various usage conditions such as discharge, ambient temperature, etc. are not maintained within the specified ranges the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage.

11. Toxicological information (in case of electrolyte leakage from the battery)

Acute toxicity	: Oral(rat) LD50 > 2000mg/kg (estimated)
Irritation	: Irritating to eye and skin.
Mutagenicity	: Not specified.
Chronic toxicity	: Not specified.

12. Ecological information

In case of the worn out battery was disposed in land, the battery case may be corroded, and leak electrolyte. However, there is no environmental impact information.

Mercury (Hg), Cadmium (Cd) and Lead (Pb) are not used in cell.

13. Disposal considerations

When the battery is worn out, dispose of it under the ordinance of each local government.

14. Transport information

During the transportation of a large amount of batteries by ship, trailer or railway, do not leave them in the places of high temperatures and do not allow them to be exposed to condensation.

During the transportation do not allow packages to be dropped or damaged.

Proper shipping name : Lithium metal batteries

UN Number, UN Class : UN3090, Class9 (for the Air transport by PI968 Section IA or IB)
: Exemption (for the Marine transport and the Air transport by Section II of PI 968, 969 or 970)
Even though the cells are classified as lithium metal batteries (UN3090 or UN3091), they are not subject to some requirements of Dangerous Goods Regulations because they meet the following:
1. for cells, the lithium content is not more than 0.3g ;
2. each cell is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, PartIII, sub-section 38.3.
3. each cell is manufactured in ISO9001 certified factory.

Please refer to the following reference information about concrete ways of transportation. Actual content of packaging label and shipping documents varies by shipping companies. Make sure to confirm in advance with your shipping company.

Information of reference

	Reference	Packing Instruction(PI)/ Special provision(SP)	Note
Air transport	IATA DGR	PI 968 Section I A	Cells, Cargo Aircraft only; Net quantity per package Max. 35kg
		PI 968 Section I B	Cells, Cargo Aircraft only; net quantity per package Max. 2.5kg
		PI 968 Section II	Cells, Cargo Aircraft only; not more than one package in any single consignment; net quantity per package Max. 2.5kg
		PI 969 Section II	Cells packed with equipment
		PI 970 Section II	Cells contained in equipment, button cell batteries
Marine transport	IMDG Code	SP 188	

15. Regulatory information

- IATA Dangerous Goods Regulations 59th Edition (IATA DGR)
- IMO International Maritime Dangerous Goods Code 2016 Edition (IMDG Code)
- UN Recommendations on the Transportation of Dangerous Goods, Model Regulations
- UN Recommendations on the Transportation of Dangerous Goods, Manual of Tests and Criteria
- EU Battery Directive (2006/66/EC, 2013/56/EU)
- Regulation (EC) No. 1907/2006 on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)
- State of California Regulations - Best management practices for Perchlorate Materials

16. Other information

This PSDS is provided to customers as reference information in order to handle batteries safely. It is necessary for the customer to take appropriate measures depending on the actual situation such as the individual handling, based on this information.

In California only, packages that contain CR lithium coin cells and the Owners/Operating Instructions of products that contain CR lithium coin cells must include the following statement: "Perchlorate Material - special handling may apply.

See <http://www.dtsc.ca.gov/hazardouswaste/perchlorate>".

The effective date for this Perchlorate label is July 1, 2006 for non-consumer products and January 1, 2007 for consumer products.

MATERIAL SAFETY DATA SHEET

SECTION 1: PRODUCT AND MANUFACTURER

Product name: Sealed maintenance-free lead acid batteries

Manufacturer: BAO TONG USA dba BATTERY WORLD

Address: Hanqiang Street, Wuhan economic & technology development zone,
WUHAN, China 430056

Tel: +86-27-84891320

US Office: 1032 E. Main Street, Alhambra, CA 91801

Tel: 626-289-5962

Fax: 626-576-2503

Date of Revision: 01/10/2014

SECTION 2: HAZARDOUS COMPONENTS

COMPONENTS	%WEIGHT	TLV	LD50 ORAL	LC50 INHALATION	LC50 CONTACT
Lead (Pb, PbO ₂ , PbSO ₄)	About 70%	N/A	(500) mg/Kg	N/A	N/A
Sulfuric Acid	About 20%	1 mg/m ³	(2.140) mg/Kg	N/A	N/A
Fiberglass Separator	About 5%	N/A	N/A	N/A	N/A
ABS or PP	About 5%	N/A	N/A	N/A	N/A

SECTION 3: PHYSICAL DATA

COMPONENTS	DENSITY	MELTING POINT	SOLLUBILITY (H ₂ O)	ODOR	APPEARANCE
Lead	11.34	327.4°C (Boiling)	None	None	Sliver-Gray Metal
Lead Sulfate	6.2	1070°C (Boiling)	40 mg/l (15°C)	None	White Powder
Lead Dioxide	9.4	290°C (Boiling)	None	None	Brown Powder
Sulfuric Acid	About 1.3	About 114°C (Boiling)	100%	Acidic	Clear Colorless Liquid
Fiberglass Sep.	N/A	N/A	SLIGHT	TOXIC	WHITE FIBROUS GLASS
ABS or PP	N/A	N/A	NONE	NO ODOR	SOLID

SECTION 4: PROTECTION

EXPOSURE	PROTECTION	COMMENTS
SKIN	Rubber gloves, Apron, Safety shoes	Protective equipment must be worn if battery is cracked or otherwise damaged.
RESPIRATORY	Respirator (for lead)	A respirator should be worn during reclaim operations if the TLV exceeded.
EYES	Safety goggles, Face Shield	

SECTION 5: FLAMMABILITY DATA

COMPONENTS	FLASHPOINT	EXPLOSIVE LIMITS	COMMENTS
Lead	None	None	
Sulfuric Acid	None	None	
Hydrogen	259°C	4% - 74.2%	Sealed batteries can emit hydrogen only if over charged (float voltage > 2.4 VPC). The gas enters the air through the vent caps. To avoid the chance of a fire or explosion, keep sparks and other sources of ignition away from the battery. Extinguishing Media: Dry chemical, foam, CO ₂
Fiberglass Sep.	N/A	N/A	Toxic vapors may be released. In case of fire: wear self-contained breathing apparatus.
478 Polystyrene	None	N/A	Temperatures over 300 °C (572°F) may release combustible gases. In case of fire: wear positive pressure self-contained breathing apparatus.

SECTION 6: REACTIVITY DATA

COMPONENT	Lead/lead compounds
STABILITY	Stable
INCOMPATIBILITY	Potassium, carbides, sulfides, peroxides, phosphorus, sulfurs.
DECOMPOSITION PRODUCTS	Oxides of lead and sulfur.
CONDITIONS TO AVOID	High temperature, Sparks and other sources of ignition.
COMPONENT	Sulfuric Acid
STABILITY	Stable at all temperatures
POLYMERIZATION	Will not polymerize
INCOMPATIBILITY	Reactive metals, strong bases, most organic compounds
DECOMPOSITION PRODUCTS	Sulfuric dioxide, trioxide, hydrogen sulfide, hydrogen
CONDITIONS TO AVOID	Prohibit smoking, sparks, etc. from battery charging area. Avoid mixing acid with other chemicals.

SECTION 7: CONTROL MEASURES

<p>1. Store lead/acid batteries with adequate ventilation. Room ventilation is required for batteries utilized for standby power generation. Never recharge batteries in an unventilated, enclosed space.</p> <p>2. Do not remove vent caps. Follow shipping and handling instructions that are applicable to the battery type. To avoid damage to terminals and seals, do not double-stack industrial batteries.</p> <p>STEPS TO TAKE IN CASE OF LEAKS OR SPILLS</p> <p>If sulfuric acid is spilled from a battery, neutralize the acid with sodium bicarbonate (baking soda), sodium carbonate (soda ash), or calcium oxide (lime).</p> <p>Flush the area with water discard to the sewage systems. Do not allow unneutralized acid into the sewage system.</p> <p>WASTE DISPOSAL METHOD:</p> <p>Neutralized acid may be flushed down the sewer. Spent batteries must be treated as hazardous waste and disposed of according to local state, and federal regulations. A copy of this material safety data must be supplied to any scrap dealer or secondary smelter with battery.</p> <p>ELECTRICAL SAFETY</p> <p>Due to the battery's low internal resistance and high power density. High levels of short circuit can be developed across the battery terminals. Do not rest tools or cables on the battery. Use insulated tools only.</p> <p>Follow all installation instruction and diagrams when installing or maintaining battery systems.</p>
--

SECTION 8: HEALTH HAZARD DATA

<p>LEAD: The toxic effects of lead are accumulative and slow to appear. It affects the kidneys, reproductive, and central nervous system.</p> <p>The symptoms of lead overexposure are anemia, vomiting, headache, stomach pain (lead colic), dizziness, loss of appetite, and muscle and joint pain. Exposure to lead from a battery most often occurs during lead reclaim operations through the breathing or ingestion of lead dusts and fumes.</p> <p>THIS DATA MUST BE PASSED TO ANY SCRAP OR SMELTER WHEN A BATTERY IS RESOLD.</p>
<p>SULFURIC ACID: Sulfuric acid is a strong corrosive. Contact with acid can cause severe burns on the skin and in the eyes. Ingestion of sulfuric acid will cause GI tract burns. Acid can be release if the battery case is damaged or if the vents are tampered with.</p>
<p>FIBERGLASS SEPARATOR: Fibrous glass is an irritant of the upper respiratory tract, skin and eyes. For exposure up to 10F/CC use MSA Comfort with type H filter. Above 10F/CC up to 50F/CC use Ultra-Twin with type H filter.</p> <p>NTP or OSHA does not consider this product carcinogenic.</p>

SECTION 9: SULFURIC ACID PRECAUTIONS

INHALATION: Acid mist from formation process may cause respiratory irritation, remove from exposure and apply oxygen if breathing is difficult.

SKIN CONTACT: Acid may cause irritation, burns or ulceration. Flush with plenty of soap and water, remove contaminated clothing, and see physician if contact area is large or if blisters form.

EYE CONTACT: Acid may cause severe irritation, burns, cornea damage and blindness. Call physician immediately and flush with water until physician arrives.

INGESTION: Acid may cause irritation of mouth, throat, esophagus and stomach. Call physician. If patient is conscious, flush mouth with water, have the patient drink milk or sodium bicarbonate solution.

DO NOT GIVE ANYTHING TO AN UNCONSCIOUS PERSON.

SECTION 10: TRANSPORTATION REGULATIONS

We hereby certify that all Bao Tong USA 's Maintenance Free Rechargeable Sealed Lead Acid batteries conform to the UN2800 classification as " Batteries, wet, Non- Spillable, and electric storage" as a result of passing the Vibration and Pressure Differential Test described in DOT [\[49 CFR 173.159\(d\)\]](#) and IATA/ICAO [\[Special Provision A67\]](#).

Bao Tong's Batteries having met the related conditions are EXEMPT from hazardous goods regulations for the purpose of transportation by DOT, and IATA/ICAO, and therefore are unrestricted for transportation by any means. For all modes of transportation, each battery outer package is labeled "NON-SPILLABLE". All our Batteries are marked non-spillable.



Specialized Fire Products

SOLO 370 LITHIUM-ION BATTERY

SAFETY DATA SHEET

SDS0096US-EN
ACCORDING TO US CFR 1910.1200

SECTION 1: IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

1.1 Product identifier	
Product Name	Solo 370
Trade Name	Solo 370-XXX (XXX denotes customer variant)
CAS No.	Mixture.
EINECS No.	Mixture.
REACH Registration No.	None assigned.
1.2 Relevant identified uses of the substance or mixture and uses advised against	
Identified Use(s)	Battery product.
Uses Advised Against	None known.
1.3 Details of the supplier of the safety data sheet	
Company Identification	SDi, LLC, 3535 State Highway 66, Parkway 100 Building 6, Neptune, NJ 07753, USA
Telephone	(732) 751 9266
Fax	(732) 751 9241
E-mail	sales@sdifire.com
1.4 Emergency telephone number	
Info Trac	1-800-535-5053
1.5 Details of the Manufacturer	
Company Identification	Detector testers (No Climb Products Ltd), Edison House, 163 Dixons Hill Road, Welham Green, Hertfordshire AL9 7JE, United Kingdom.
Telephone	+44 (0) 1707 282760
Fax	+44 (0) 1707 282777
E-mail	SDS@detector testers.com

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture	
US CFR 1910.1200	Not classified as dangerous for supply/use. The battery is a sealed unit and therefore the ingredients present have no hazard potential except in a situation where the battery has been violated or dismantled.
2.2 Label elements	
Hazard Pictogram(s)	None.
Signal Word(s)	None.
Hazard Statement(s)	None.
Precautionary Statement(s)	None.
2.3 Other hazards	None.
2.4 Additional Information	There is no hazard when the measures for handling and storage are followed. In case of cell damage, possible release of dangerous substances and a spontaneous flammable gas mixture may be released. Battery content must not get in contact with water. Contact with water liberates extremely flammable gases.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Mixtures

Hazardous Ingredient(s)	%W/W	CAS No.
Cobalt oxide	<15	1307-96-6
Manganese dioxide	<15	1313-13-9
Nickel Oxide	<15	1313-99-1
Electrolyte(*)	<15	None

(*) Main Ingredients: Lithium hexafluorophosphate, organic carbonates

3.2 Additional Information

During the charge process a lithium carbon intercalation phase is formed, which is highly flammable and corrosive, but not released under normal usage.

Mercury content: Hg<0.1mg/kg

Cadmium content: Cd<1mg/kg

Lead content: Pb<10mg/kg

For full text of H/P statements see section 16.

**SECTION 4: FIRST AID MEASURES****4.1 Description of first aid measures**

Inhalation

Unlikely route of exposure.

Skin Contact

Electrolyte leakage: Remove to fresh air immediately. Seek medical treatment.

Eye Contact

Unlikely route of exposure.

Electrolyte leakage: After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water.

Ingestion

Unlikely route of exposure.

Electrolyte leakage: Flush eyes with water for at least 15 minutes. Seek medical treatment.

4.2 Most important symptoms and effects, both acute and delayed

Unlikely route of exposure.

Electrolyte leakage: Make victim drink plenty of water. Do not induce vomiting. Seek medical treatment.

4.3 Indication of any immediate medical attention and special treatment needed

None anticipated.

Electrolyte leakage Can cause damage to the eyes and skin.

Unlikely to be required but if necessary treat symptomatically.

SECTION 5: FIREFIGHTING MEASURES**5.1 Extinguishing media**

Suitable Extinguishing media

Extinguish preferably with dry chemical or sand.

Unsuitable extinguishing media

Water, Water spray.

5.2 Special hazards arising from the substance or mixture

Hazardous decomposition product(s) include: Hydrofluoric acid (upon contact with water), Hydrogen fluoride (HF) gas, Carbon monoxide and Carbon dioxide.

5.3 Advice for fire-fighters

In case of major fire and large quantities: A self contained breathing apparatus should be worn. If possible, remove cell(s) from fire fighting area. If heated above 125°C, cell(s) can explode/vent. Cell is not flammable but internal organic material will burn if the cell is incinerated.

SECTION 6: ACCIDENTAL RELEASE MEASURES**6.1 Personal precautions, protective equipment and emergency procedures**

Use PPE. Avoid contact with skin, eyes or clothing. Avoid breathing fumes.

6.2 Environmental precautions

Prevent entry into drains.

6.3 Methods and material for containment and cleaning up

Adsorb spillages onto sand, earth or any suitable adsorbent material. Transfer to a container for disposal.

6.4 Reference to other sections

See Also Section: 8, 13

SECTION 7: HANDLING AND STORAGE**7.1 Precautions for safe handling**

Avoid mechanical damage to the cell. Do not open or disassemble.

Do not throw batteries in water.

Keep away from: Children

Avoid overheating.

7.2 Conditions for safe storage, including any incompatibilities

Keep away from open flames, heat and sources of ignition.

Storage temperature

Ambient.

Storage life

Stable under normal conditions.

Incompatible materials

None anticipated.

7.3 Specific end use(s)

Battery product

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**8.1 Control parameters**

Under normal conditions of battery use, internal components will not present a health or environmental hazard.

8.1.1 Occupational Exposure Limits

SUBSTANCE	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m ³)	STEL (ppm)	STEL (mg/m ³)	Note
Cobalt oxide	1307-96-6	-	5*	-	-	OSHA, Sen.
Manganese dioxide	1313-13-9	-	5*	-	-	OSHA
Nickel oxide	1313-99-1	-	5*	-	-	OSHA, Carc
Carbon	7440-44-0	-	5*	-	-	OSHA

Source:

OSHA = Occupational Safety and Health Administration *Respirable Dust.

8.2 Exposure controls**8.2.1 Appropriate engineering controls**

Provide adequate ventilation.

8.2.2 Personal protection equipment



SOLO 370 LITHIUM-ION BATTERY

Specialized Fire Products

Eye/ face protection



Not normally required.
Electrolyte leakage: Wear eye/face protection.

Skin protection (Hand protection/ Other)



Not normally required.
Electrolyte leakage: Wear impervious gloves.

Respiratory protection



No personal respiratory protective equipment normally required.
Electrolyte leakage: Wear suitable respiratory protective equipment.

Thermal hazards

Not applicable.

8.2.3 Environmental Exposure Controls

Avoid release to the environment.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Solid.
Colour	Not applicable.
Odour	Odourless.
Odour threshold	Not applicable.
pH	Not determined.
Melting point/freezing point	Not applicable.
Initial boiling point and boiling range	Not applicable.
Flash Point	Not applicable.
Evaporation rate	Not applicable.
Flammability (solid, gas)	Non-flammable.
Upper/lower flammability or explosive limits	Not applicable.
Vapour pressure	Not applicable.
Vapour density	Not applicable.
Relative density	Not applicable.
Solubility(ies)	Insoluble
Partition coefficient: n-octanol/water	Not applicable.
Auto-ignition temperature	Not applicable.
Decomposition Temperature	Not applicable.
Kinematic Viscosity	Not applicable.
Explosive properties	Not explosive when used as intended.
Oxidising properties	Not oxidising when used as intended.

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity	Stable under normal conditions.
10.2 Chemical stability	Stable under normal conditions.
10.3 Possibility of hazardous reactions	No hazardous reactions known if used for its intended purpose.
10.4 Conditions to avoid	Do not heat the product.
10.5 Incompatible materials	Stable under normal conditions.
10.6 Hazardous decomposition product(s)	No hazardous decomposition products known when used as intended. See Section: 5 Firefighting measures

SECTION 11: TOXICOLOGICAL INFORMATION

Unlikely to cause harmful effects under normal conditions of handling and use.	
11.1 Information on toxicological effects	
Acute toxicity	Low acute toxicity.
Skin corrosion/irritation	Non-irritant.
Serious eye damage/irritation	Not classified.
Respiratory or skin sensitization	It is not a skin sensitizer.
Germ cell mutagenicity	There is no evidence of mutagenic potential.
Carcinogenicity	No evidence of carcinogenicity.
Reproductive toxicity	None anticipated.
STOT - single exposure	Not classified.
STOT - repeated exposure	Not classified.
Aspiration hazard	None anticipated.
11.2 Other information	None.



Specialized Fire Products

SOLO 370 LITHIUM-ION BATTERY

SECTION 12: ECOLOGICAL INFORMATION

12.1	Toxicity	Under normal conditions of battery use, internal components will not present a health or environmental hazard.
12.2	Persistence and degradability	Not applicable.
12.3	Bioaccumulative potential	Not applicable.
12.4	Mobility in soil	Not applicable.
12.5	Other adverse effects	Do not flush spill material into any public water system.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1	Waste treatment methods	Consult an accredited waste disposal contractor or the local authority for advice.
13.2	Additional Information	Disposal should be in accordance with local, state or national legislation.

SECTION 14: TRANSPORT INFORMATION

14.1	UN number	UN 3480, UN3481
14.2	UN proper shipping name	Batteries, Lithium Ion
14.3	Transport hazard class(es)	
	ADR	Under special provision 188.
	IMDG	Under special provision 188.
	IATA	UN 3480, UN 3481
	DOT	Not applicable.
14.4	Packing group	Not applicable.
14.5	Environmental hazards	Not applicable.
14.6	Special precautions for user	Not applicable.
14.7	Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable.

SECTION 15: REGULATORY INFORMATION

15.1	Safety, health and environmental regulations/legislation specific for the substance or mixture	
15.1.1	OSHA	
	Toxic and hazardous substances (29 CFR 1910; Subpart Z)	All chemicals are not listed
	National emission standards for hazardous air pollutants (40 CFR 61.01)	All chemicals are not listed
15.1.2	Title III Consolidated List of Lists Sec 313	Cobalt oxide (Cobalt compounds), Manganese dioxide (Manganese compounds), Nickel oxide (Nickel compounds)
15.1.3	OSPAR List of Chemicals for Priority Action	All chemicals are not listed
15.1.4	State Right to Know Lists	Cobalt oxide (cobalt compounds) - New Jersey Nickel oxide (nickel compounds) - New Jersey, Pennsylvania
15.1.5	TSCA (Toxic Substance Control Act)	Cobalt oxide (Cas 1307-96-6), Manganese dioxide (Cas 1313-13-9), Nickel oxide (Cas 1313-99-1), Carbon (Cas 7440-44-0).
15.1.6	Proposition 65 (California)	Cobalt oxide (Cas 1307-96-6), Nickel oxide (Cas 1313-99-1)

SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements:

USA

NFPA		HMIS	
Health	0	Health	0
Fire	1	Flammability	1
Instability	0	Physical hazards	0

LEGEND

LTEL	Long Term Exposure Limit
STEL	Short Term Exposure Limit
OSPAR	Oslo and Paris Convention
OSHA	Occupational Safety and Health Administration
NFPA	National Fire Protection Association
HMIS	Hazardous Material Information System
DNEL	Derived No Effect Level
PNEC	Predicted No Effect Concentration
VOC	Volatile Organic Compounds

Disclaimers

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Annex to the extended Safety Data Sheet (eSDS)

No information available.



MATERIAL SAFETY DATA SHEET

MSDS Number: HFR-CQC-ZQ-0076 Revision:1/A

Section I - Product Identification and company/undertaking

Product Name : Total 8100PCS Nickel Metal Hydride Battery

Chemical System : Nickel/Metal Hydride

Designated for Recharge : Yes No

Telephone No. : 510-687-0388

Fax : 510-687-0328

Battery producer and MSDS issuer: Tenergy Corporation

Company and Address : **Tenergy Corporation**
436 Kato Terrace, Fremont, CA 94539
United States

Section II - Hazardous Ingredients

IMPORTANT NOTE: The product is a manufactured article as described in 29 CFR 1910.1200. The battery cell is contained in a hermetically-sealed case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, hazardous materials are fully contained inside the battery cell. The battery cell should not be opened or exposed to heat because exposure to the following ingredients contained within could be harmful under some circumstances. The following information is provided for the user's information only.

Chemical Name	CAS No.	OSHA PEL (mg/m ³)	ACGIH TLV (mg/m ³)
Nickel (powder)	7440-02-0	1TWA	1 TWA
Nickel hydroxide	12054-48-7	1 TWA	1 TWA
Cobalt	7440-48-4	0.1 TWA	Dust & Fume 0.005
Manganese	7439-96-5	Fume: 5 Ceiling Limit	Dust: 5 Fume: 1
Lanthanum	7439-91-0	NA	NA
Cerium	7440-45-1	NA	NA
Neodymium	7440-00-8	NA	NA
Potassium hydroxide	1310-58-3	NA	2 Ceiling Limit
Sodium hydroxide	1310-73-2	2 TWA	2 Ceiling Limit
Lithium hydroxide	1310-65-2	NA	NA



The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. Tenergy Corporation makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities from reliance on it.

- Notes: 1. Concentrations vary depending on the state of charge or discharge.
2. TWA is the time weighted average concentration over an 8-hour period.

Section III — Physical Data for Battery

Melting point (°F) NA	Boiling point (°F) NA	% Volatile by Volume NA
Vapor Pressure (mm Hg) NA	Evaporation Rate Vapor	Density (Air = 1) NA
Specific Gravity (H ₂ O) NA	Solubility in Water NA	Appearance and Odor No Odor

Section IV - Fire and Explosion Hazard Data

Flash Point: NA Lower Explosive Limit: NA Upper Explosive Limit: NA

Extinguishing Media: Any class of extinguishing medium may be used on the batteries or their packing material.

Special Fire Fighting Procedures: Exposure to temperatures of above 212°F can cause venting of the liquid electrolyte.

Internal shorting could also cause venting of the electrolyte. There is potential for exposure to iron, nickel, cobalt, rare earth metals (cerium, lanthanum neodymium, and praseodymium), manganese, and aluminum fumes during fire; use self-contained breathing apparatus.

Section V – First Aid Measures

If electrolyte leakage occurs and makes contact with skin, wash with plenty of water immediately.

If electrolyte comes into contact with eyes, wash with copious amounts of water fifteen(15)minutes, and contact a physician.

Section VI - Health Hazard Data

Threshold Limit Values: See Section II

Effects of a Single (Acute) Overexposure:

Inhalation: During normal use inhalation is an unlikely route of exposure due to containment of hazardous materials within the battery case. However, should the batteries be exposed to extreme heat or pressures



causing a breach in the battery cell case, exposure to the constituents may occur. Inhalation of cobalt dusts may result in pulmonary conditions.

Ingestion: If the battery case is breached in the digestive tract, the electrolyte may cause localized burns.

Skin Absorption: No evidence of adverse effects from available data.

Skin Contact: Exposure to the electrolyte contained inside the battery may result in chemical burns. Exposure to nickel may cause dermatitis in some sensitive individuals.

Eye Contact: Exposure to the electrolyte contained inside the battery may result in severe irritation and chemical burns.

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Carcinogenicity:

Nickel has been identified by the National Toxicology Program (NTP) as reasonably anticipated to be a carcinogen. Cobalt has been identified by IARC as a 2B carcinogen.

Other Effects of Repeated (Chronic) Exposure:

Chronic overexposure to nickel may result in cancer; dermal contact may result in dermatitis in sensitive individuals.

Medical Conditions Aggravated by Overexposure:

A knowledge of the available toxicology information and of the physical and chemical properties of the material suggests that overexposure is unlikely to aggravate existing medical conditions.

Emergency and First Aid Procedures:

Swallowing: Do not induce vomiting. Seek medical attention immediately.

Skin: If the internal cell materials of an opened battery cell come into contact with the skin, immediately flush with water for at least 15 minutes.

Inhalation: If potential for exposure to fumes or dusts occurs, remove immediately to fresh air and seek medical attention.

Eyes: If the contents from an opened battery come into contact with the eyes, immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention.

Section VII - Reactivity Data

The batteries are stable under normal operating conditions.



Hazardous polymerization will not occur.

Hazardous decomposition products: oxides of nickel, cobalt, manganese, lanthanum, and cerium.

Conditions to avoid: heat, open flames, sparks, and moisture.

Potential incompatibilities (i.e., materials to avoid contact with): The battery cells are encased in a non-reactive container; however, if the container is breached, avoid contact of internal battery components with acids, aldehydes, and carbamate compounds.

Section VIII - Spill and Leak Procedures

Spill and leaks are unlikely because cells are contained in an hermetically-sealed case. If the battery case is breached, don protective clothing that is impervious to caustic materials and absorb or pack spill residues in inert material. Dispose in accordance with applicable state and federal regulations.

Section VIX - Safe Handling and Use (Personal Protective Equipment)

Ventilation Requirements: Not required under normal use.

The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. **Tenergy Corporation** makes no warranty,

expressed or implied, with respect to this information and disclaims all liabilities from reliance on it.

Respiratory Protection: Not required under normal use.

Eye Protection: Not required under normal use.

Gloves: Not required under normal use.

Section X- Precautions for Safe Handling and Use

Storage: Store in a cool place, but prevent condensation on cell or battery terminals. Elevated temperatures may result in reduced battery life. Optimum storage temperatures are between -31°F and 95°F.

Mechanical Containment: If there are special encapsulations or sealing requirements, consult your Tenergy representative about possible cell hazard precautions or limitations.

Handling: Accidental short circuit will bring high temperature elevation to the battery as well as shorten the battery life. Be sure to avoid prolonged short circuit since the heat can burn attendant skin and even rupture of the battery cell case.

Batteries packaged in bulk containers should not be shaken. Metal covered tables or belts used for assembly of batteries into devices can be the source of short circuits; apply insulating material to assembly work



surface. If soldering or welding to the case of the battery is required, consult your Tenergy representative for proper precautions to prevent seal damage or external short circuit.

Charging: This battery is designed for recharging. A loss of voltage and capacity of batteries due to self-discharge during prolonged storage is unavoidable. Charge battery before use. Observe the specified charge rate since higher rates can cause a rise in internal gas pressure which may result in damaging heat generation or cell rupture and/or venting.

Labeling: If normal label warnings are not visible, it is important to provide a device label stating:
CAUTION: Do not dispose in fire, mix with other battery types, charge above specified rate, connect improperly, or short circuit, which may result in overheating, explosion or leakage of cell contents.

Section XI – Measures for fire extinction

In case of fire, it is permissible to use any of extinguishing medium on these batteries or their packing material. Cool exterior of batteries if exposed to fire to prevent rupture.

Fire fighters should wear self-contained breathing apparatus

Section XII – Ecological information

N.A

Section XIII - Recycling and Disposal

Tenergy Corporation encourages battery recycling. Our Nickel Metal Hydride batteries are not defined by the federal government as hazardous waste and are safe for disposal in the normal municipal waste stream. , DO NOT INCINERATE or subject battery cells to temperatures in excess of 212°F. Such treatment can cause cell rupture.

Section XIV – Transportation

Tenergy sealed Nickel Metal Hydride batteries are considered to be "dry cell" batteries and are not subject to dangerous goods regulation for the purpose of transportation by the U.S. Department of Transportation (DOT), the International Civil Aviation Organization (ICAO), the International Air Transport Association (IATA) or the International Maritime Dangerous Goods regulations (IMDG). More information concerning shipping, testing, marking and packaging can

be obtained from Labelmaster at <http://www.labelmaster.com>. IATA requires that batteries being transported by air must be protected from short-circuiting and protected from movement that could lead to short-circuiting.

The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. **Tenergy Corporation** makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities from reliance on it.

battery is complying with Special Provision A123 under current edition of IATA Dangerous goods Regulation



Section XV – Regulatory Information

Special requirement be according to the local regulatories

Section XVI – Other Information

The data in this Material Safety Data Sheet relates only to the specific material designated herein



Lithium Polymer Battery

Safety Data Sheet

Version: 2.1

SECTION 1. Product and Company Identification

Product Name	: Li-Polymer Battery
Synonyms	: LiPo – [See APPENDIX A]
Use of the substance/preparation	: Lithium polymer rechargeable cells
Company identification	: Vertical Partners West 14028 North Ohio Street Rathdrum, ID 83858
Telephone number for information	: 1-800-705-0620 (USA)
24 hour emergency contact	: Chemtrec 1-800-424-9300

SECTION 2. Hazards Identification

2.1. OSHA Regulatory Status

The batteries are hermetically sealed articles under normal conditions of use. The products referenced herein are exempt articles and are not subject to OSHA's Hazard Communication Standard requirements for preparation of safety data sheets. This information is provided as a service to our customers.

2.2. Potential health effects

Lithium cobalt oxide: Odorless blue-black powder - cobalt and cobalt compounds are considered to be possible human carcinogens. By International Agency for Research on Cancer (IARC): May irritate eyes, skin, nose, throat and respiratory system and may cause allergic skin sensitization.

Carbon: Odorless black powder - no cases of carbon being harmful to humans have been reported. World Health Organization (WHO), and International Labour Organization (ILO) have never verified that carbon causes irritation of the skin and mucous membrane, etc.

Electric agent: Black powder (Garlic-Like), Toxicity (Am. Conf. Of Gov. Ind. Hygienists ACGIH 2000 Edition) - Simple Asphyxiant, Flammability limits in air (STP conditions): 2.4-83vol% (The upper limit could reach 100%)

Bond: Odorless white powder - inhalation and skin contact are expected to be the primary routes of occupational exposure to this material. As a finished product, it is a synthetic, high molecular weight polymer. Due to its chemical and physical properties, this material does not require special handling other than the good industrial hygiene and safety practices employed with any industrial material of this type. Under normal processing conditions this material releases fume or vapor. Components of these releases may vary with processing time and temperature. Process releases may produce eye, skin and/respiratory tract irritation and with repeated or prolonged exposures, nausea, drowsiness, headache and weakness. Although unlikely under normal handling conditions, if this material is heated in excess of 600°F (315°C), hazardous, decomposition products will be produced. Hazardous decomposition products include hydrogen fluoride and oxides of carbon, the concentrations of which vary with temperature and heating regimens.

Electrolyte: Colorless liquid - may cause moderate to severe irritation, burning, and dryness of the skin. May cause eye irritation or burning. Breathing of the mists, vapors or fumes may irritate the nose, throat and lungs. Exposure of material with areas which contain water may generate hydrofluoric acid which can cause immediate burns on skin, severe eye burns to the mouth and gastrointestinal tract if inhaled. Direct exposure to areas of the body needs to be treated immediately to prevent injury.

2.3. Potential environmental effects

No additional information available.

Safety Data Sheet

SECTION: 3. Composition/information on ingredients

Name	CAS number	%
Carbon (C)	133-86-4	10-25
Lithium-polymer Cobalt Oxide (LCoO ₂)	12057-24-8 1308-04-9	20-40
Lithium-Polymer Hexafluorophosphate (LiPF ₆)	21340-40-3	1.4
Organic Carbonates (EC/EMC/DEC)	N/A	8-18
Polyvinylidene Fluoride (PVDF)	24937-79-9	1-5
PP+PE	9003-07-0 9002-8804	4-6
Copper (Cu)	7440-50-8	15-30
Aluminum (Al)	7429-50-5	10-20
Nickel	7440-02-0	0.5-1

SECTION: 4. First aid measures

4.1. First aid procedures

First-aid measures general	: The following first aid measures are required in the case of exposure to interior battery components after damage of the external battery casing. Undamaged, closed cells do not represent a danger to health.
First-aid measures after inhalation	: Assure fresh air breathing. If breathing difficulty or discomfort occurs and persists, see a physician. If breathing stops, give artificial respiration and see a physician immediately.
First-aid measures after skin contact	: Remove contaminated clothing and thoroughly wash with soap and plenty of water. If irritation persists, consult a physician.
First-aid measures after eye contact	: Rinse thoroughly with plenty of water for at least 15 minutes. If symptoms persist contact a physician.
First-aid measures after ingestion	: Contents of an open battery can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract. If open battery is ingested, do not induce vomiting or give food or drink. Seek medical attention immediately.

SECTION: 5. Firefighting measures

5.1. Extinguishing media

Hazardous combustion: When burned, hazardous products of combustion including fumes of carbon monoxide, carbon dioxide, and fluorine can occur.

Fire and explosion: This material does not represent an unusual fire or explosion hazard.

Flash point: N/A

Auto ignition: N/A

Flammability limits: N/A

5.2. Extinguishing media

Suitable extinguishing media	: Carbon dioxide, dry chemical or foam
Protection during firefighting	: Wear protective clothing and self-contained breathing apparatus to avoid fume inhalation.

Safety Data Sheet

SECTION: 6. Accidental release measures

6.1. Personal precautions

Evacuate personnel to safe areas, ventilate the area. Refer to protective measure listed in section 7 and 8.

6.1.1. For non-emergency personnel

Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment : Inhalation of any vapor that may be emitted should be avoided. Wear self-contained breathing apparatus to avoid fume inhalation. Rubber gloves should be used to handle the contents of crushed or opened batteries.

6.2. Environmental precautions

Sweep up and place in a suitable container, dispose of waste according to local, state and federal laws and regulations.

SECTION: 7. Handling and storage

7.1. Handling

Battery charge: Charge according to manufacturer's specifications.

Battery disassembly: The batteries should never be disassembled, or mechanically abused. Should a battery unintentionally be crushed or opened, thus releasing its content, rubber gloves should be used to handle battery components. The inhalation of any vapor that may be emitted should be avoided.

Short circuiting of a battery: As with any battery, short circuit causes heating. In addition, short circuit reduces the life of the battery and can lead to ignition of surrounding materials. Physical contact with a short-circuited battery can cause skin burns.

Reverse polarity: Avoid reversing the battery polarity of a battery pack, which can cause the battery to be damaged and potentially cause a fire.

7.2. Storage

Storage conditions : Store in a cool, dry and ventilated area. Do not place the battery near heating equipment, or expose to direct sunlight for long periods of time. Elevated temperatures can result in shortened battery life and degrade performance.

SECTION: 8. Exposure controls/personal protection

- | | |
|--------------------------------------|--|
| Personal protective equipment | : None required under normal use. |
| Eye protection | : Use ANSI approved chemical work safety goggles or face shield, when handling a leaking or ruptured battery. |
| Skin protection | : Use rubber apron and protective gloves if working with or handling a ruptured battery. |
| Hand protection | : In case of spill use PVC, neoprene or nitrile gloves of 15 mils (0.015 inch) or thicker. |
| Work hygienic practice | : Use good chemical hygiene practice. Wash hands after use and before drinking, eating or smoking. Wash hands thoroughly after cleaning-up a battery spill caused by leaking battery. No eating, drinking, or smoking in battery storage area. Launder contaminated cloth before re-use. |
| Supplementary safety and health data | : If the battery case is broken or cells leaking, the main hazard is the electrolyte. The electrolyte is a solution of LiPF ₆ , EC, EMC and DEC. |

Safety Data Sheet

SECTION: 9. Physical and chemical properties

Physical state	: Solid article
Freezing point	: N/A
Boiling point	: N/A
Density	: N/A
Vapor pressure	: N/A
Vapor density	: N/A
Flash point	: N/A
Evaporation rate	: N/A

SECTION: 10. Stability and reactivity

10.1. Stability

Stable during normal operating conditions.

10.2. Conditions to avoid

Keep away from open flames, hot surfaces, and sources of ignition. Do not puncture, crush, or incinerate.

10.3. Incompatible materials

Incompatible with water, moisture, strong oxidizing agents, reducing agents, acids and bases.

10.4. Hazardous decomposition products

None, under normal operating conditions. Carbon dioxide and hydrogen fluoride gas may be generated during combustion of battery.

SECTION: 11. Toxicological information

Not applicable under normal conditions of use. Chemicals within the battery have the following properties: Cobalt in lithium cobalt oxide is considered as a class 2B carcinogen by IARC. Organic carbonated (electrolyte) vapors are categorized as corrosive, flammable and irritants.

SECTION: 12. Ecological information

12.1 Ecotoxicity

The batteries when properly used or disposed of do not present environmental hazard. The batteries do not contain mercury, cadmium or lead.

Do not let internal components enter marine environment. Avoid release to waterways, wastewater or groundwater.

SECTION: 13. Disposal considerations

13.1. Waste treatment methods

Do not incinerate. Waste disposal must be in accordance with any and all applicable regulations. Disposal of lithium rechargeable batteries should be performed by permitted, professional disposal firms knowledgeable in federal, state or local requirements. Lithium batteries should be discharged to 0.00mAh prior to disposal.

SECTION: 14. Transport information

14.1. Basic shipping description

UN3480 Lithium ion batteries, Class 9

14.2 Additional information

Other information : These batteries must be prepared for transportation as defined by DOT, IATA, and IMDG regulations based on the mode of transportation. This consignment has passed UN 38.3 test report.

Customer service telephone number for information: 1-800-705-0620

Safety Data Sheet

	Section IA	Section IB	Section II
Capacity of Cell/Batteries	<p>Cells: greater than 20 Wh</p> <p>Batteries: greater than 100 Wh</p>	<p>Cells: no more than 20 Wh</p> <p>Batteries: no more than 100 Wh</p>	<p>* Cell/Batteries: no more than 2.7 Wh</p> <p>* Cells: more than 2.7 but no more than 20 Wh</p> <p>* Batteries: more than 2.7 Wh but not more than 100 Wh</p>
Package Limitation	<p>PAX: 5 kg</p> <p>CAO: 35 kg</p>	10 kg Gross	<p>* 2.5 kg</p> <p>* 8 cells</p> <p>* 2 batteries</p> <p>*must not be loaded in same package</p>

SECTION: 15. Regulatory information

The transportation of the lithium batteries is regulated by the United Nations "Model Regulations on Transport of Dangerous Goods".

Exceptions from shipping requirements for lithium cells and batteries are provided in 49 CFR 173.185.

Shipping of lithium batteries in aircrafts are regulated by the International Civil Aviation Organization (ICAO) and the International Air Transport Association (IATA) requirements. See special provision A88.

Shipping of lithium batteries by vessel are regulated by the International Maritime Dangerous Goods (IMDG).

SECTION: 16. Other information

The information and recommendations set forth are made in good faith and are believed to be accurate at the date of preparation. Venom makes no warranty expressed or implied with respect to this information. Venom does not accept liability for any loss or damage that may occur, whether direct, incidental or consequential, from the use of this information.

APPENDIX A

ITEM	DESCRIPTION	ITEM	DESCRIPTION
1549	20C 2S 8000mAh 7.4V LiPo Hard Case - UNI	15188	50C 3S 5000mAh 11.1V LiPo Hard Case - XT90-S
1551	10C 3S 800mAh 11.1V LiPo - Micro/Molex	15189	50C 4S 9000mAh 14.8V LiPo - UNI 2.0-TRX
1552	30C 3S 7500mAh 11.1V LiPo - UNI 2.0-L	15307	15C 3S 1200mAh 11.1V LiPo Stick - Airsoft
1553	20C 2S 3200mAh 7.4V LiPo Hardcase - UNI 2.0-L	15308	30C 3S 1500mAh 11.1V LiPo - Airsoft
1554	20C 2S 4000mAh 7.4V LiPo Hardcase - UNI 2.0-L	15309	30C 2S 1200mAh 7.4V LiPo - Airsoft
1555	20C 2S 5000mAh 7.4V LiPo Hardcase - UNI 2.0-L	15310	30C 2S 1500mAh 7.4V LiPo - Airsoft
1556	25C 2S 3300mAh 7.4V LiPo Hard Case - UNI	25001X2	45C 1S 180mAh 3.7V LiPo - JST-MCX x2
1557	25C 2S 4100mAh 7.4V LiPo Hardcase - UNI 2.0-L	25001X4	45C 1S 180mAh 3.7V LiPo - JST-MCX x4
1558	25C 2S 5000mAh 7.4V LiPo Hardcase - UNI 2.0-L	25002	30C 2S 430mAh 7.4V LiPo - JST/JST-PH
1558HXT4	25C 2S 5000mAh 7.4V LiPo Hard Case - HXT4	25003	2S 4000mAh 7.4V Transmitter LiPo - Spektrum
1559	10C 2S 1600mAh 7.4V LiPo Receiver Flat Pack	25004	30C 4S 2200mAh 14.8V LiPo - UNI 2.0
1560	10C 2S 1200mAh 7.4V LiPo Receiver Pack	25005	30C 2S 1300mAh 7.4V LiPo - UNI 2.0
1577	20C 3S 2200mAh 11.1V LiPo - UNI 2.0-L	25007	30C 3S 3200mAh 11.1V LiPo - UNI 2.0
1577HXT	20C 3S 2100mAh 11.1V LiPo - HXT 3.5mm	25008	30C 1S 30mAh 3.7V LiPo - JST-MCX
1580	20C 3S 4000mAh 11.1V LiPo - UNI 2.0-L	25009	30C 1S 70mAh 3.7V LiPo - JST-MCX
1581	20C 3S 5400mAh 11.1V LiPo - UNI 2.0-L	25010	30C 1S 200mAh 3.7V LiPo - JST-MCPX
1582	20C 3S 5000mAh 11.1V LiPo - UNI 2.0-L	25011	30C 1S 250mAh 3.7V LiPo - JST-MCX
1584	25C 1S 150mAh 3.7V LiPo - Blade/MCX	25012	30C 1S 500mAh 3.7V LiPo - Mini Losi/JST
1585	15C 2S 250mAh 7.4V LiPo	25013	30C 4S 3200mAh 14.8V LiPo - UNI 2.0
1587	20C 3S 950mAh 11.1V LiPo - Micro Jet	25014	30C 2S 300mAh 7.4V LiPo - JST/JST-PH
15000	5C 2S 2400mAh 7.4V LiPo Receiver/Transmitter Flat pack	25015	30C 6S 3200mAh 22.2V LiPo - UNI 2.0
15001	5C 2S 2100mAh 7.4V LiPo Receiver/Transmitter Hump pack	25016	30C 4S 3600mAh 14.8V LiPo - UNI 2.0
15002	20C 2S 430mAh 7.4V LiPo - JST	25017	30C 5S 3600mAh 18.5V LiPo - UNI 2.0
15003	20C 2S 800mAh 7.4V LiPo - JST	25018	30C 6S 3600mAh 22.2V LiPo - UNI 2.0
15004	20C 4S 2100mAh 14.8V LiPo Starter Box-Tamiya	25019	30C 4S 5000mAh 14.8V LiPo - UNI 2.0
15005	13C 2S 1320mAh 7.4V LiPo - JST	25020	30C 5S 5000mAh 18.5V LiPo - UNI 2.0
15006	13C 3S 1320mAh 11.1V LiPo - UNI	25021	30C 6S 5000mAh 22.2V LiPo - UNI 2.0
15007	20C 3S 3200mAh 11.1V LiPo - UNI	25023	30C 2S 2000mAh 7.4V LiPo - UNI 2.0
15008	20C 2S 5400mAh 7.4V LiPo - UNI 2.0-L	25024	30C 2S 800mAh 7.4V LiPo - JST
15009	20C 3S 6400mAh 11.1V LiPo - UNI 2.0-L	25025	30C 6S 2500mAh 22.2V LiPo - UNI 2.0
15010	20C 2S 8000mAh 7.4V LiPo - UNI	25026	30C 3S 450mAh 11.1V LiPo - JST

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ITEM	DESCRIPTION	ITEM	DESCRIPTION
15011	5C 3S 3000mAh 11.1V Receiver/Transmitter LiPo MX3	25027	70C 3S 450mAh 11.1V LiPo - JST
15012	5C 3S 2400mAh 11.1V Receiver/Transmitter LiPo Z1/Helios	25028	30C 3S 1300mAh 11.1V LiPo - UNI 2.0
15013	30C 4S 3200mAh 14.8V LiPo	25031	50C 6S 1300mAh 22.2V LiPo - UNI 2.0
15015	30C 6S 3200mAh 22.2V LiPo	25032	30C 6S 5400mAh 22.2V LiPo - UNI 2.0
15016	25C 4S 3600mAh 14.8V LiPo	25033	50C 3S 2200mAh 11.1V LiPo - UNI 2.0
15017	25C 5S 3600mAh 18.5V LiPo	25034	25C 3S 2300mAh 11.4V LiHV - UNI 2.0
15018	25C 6S 3600mAh 22.2V LiPo	25035	25C 4S 2300mAh 15.2V LiHV - UNI 2.0
15019	25C 4S 5000mAh 14.8V LiPo	25036	25C 4S 3400mAh 15.2V LiHV - UNI 2.0
15020	25C 5S 5000mAh 18.5V LiPo	25042	50C 6S 2500mAh 22.2V LiPo - UNI 2.0
15021	25C 6S 5000mAh 22.2V LiPo	25043	50C 4S 3600mAh 14.8V LiPo - UNI 2.0
15023	20C 2S 2000mAh 7.4V LiPo - UNI 2.0-L	25045	50C 6S 3600mAh 22.2V LiPo - UNI 2.0
15024	20C 3S 1300mAh 11.1V LiPo - UNI 2.0-L	25046	50C 4S 5000mAh 14.8V LiPo - UNI 2.0
15025	25C 6S 2500mAh 22.2V LiPo	25047	50C 6S 5000mAh 18.5V LiPo - UNI 2.0
15026	35C 3S 5000mAh 11.1V LiPo - UNI 2.0-L	25048	50C 6S 5000mAh 22.2V LiPo - UNI 2.0
15027	35C 4S 5000mAh 14.8V LiPo Hardcase ROAR - UNI 2.0-L	25051	30C 3S 800mAh 11.1V LiPo - JST
15031	50C 4S 5000mAh 14.8V LiPo Hardcase ROAR - UNI 2.0-L	25052X2	45C 1S 250mAh 3.7V LiPo - JST-MCX x2
15032	50C 2S 4500mAh 7.4V LiPo Saddle Pack ROAR - UNI	25052X4	45C 1S 250mAh 3.7V LiPo - JST-MCX x4
15033	40C 3S 2200mAh 11.1V LiPo - UNI	25077	30C 3S 2200mAh 11.1V LiPo - UNI 2.0
15036	50C 1S 5000mAh 3.7V LiPo Hard Case ROAR - UNI	25084	30C 1S 150mAh 3.7V LiPo - JST-MCX
15037	50C 3S 2200mAh 11.1V LiPo - UNI	25087	30C 3S 950mAh 11.1V LiPo - JST
15038	30C 3S 3200mAh 11.1V LiPo Hard Case ROAR - UNI	25146	30C 2S 210mAh 7.4V LiPo - JST/JST-PH
15038HXT4	30C 3S 3200mAh 11.1V LiPo Hard Case - HXT4	25147	30C 2S 300mAh 7.4V LiPo - JST/JST-PH
15042	50C 6S 2500mAh 22.2V LiPo	25148	30C 2S 260mAh 7.4V LiPo - JST/JST-PH
15043	50C 4S 3600mAh 14.8V LiPo	25152	30C 6S 1300mAh 22.2V LiPo - UNI 2.0
15045	50C 6S 3600mAh 22.2V LiPo	25159	30C 3S 3000mAh 11.1V LiPo - UNI 2.0
15046	50C 4S 5000mAh 14.8V LiPo	25167	30C 1S 700mAh 3.7V LiPo - Mini Lasi/JST
15047	50C 5S 5000mAh 18.5V LiPo	25168	30C 1S 250mAh 3.7V LiPo - Mini Lasi/JST
15048	50C 6S 5000mAh 22.2V LiPo	25169	30C 3S 2200mAh 11.1V LiPo - HXT3.5 Super Tigre
15049	40C 4S 3500mAh 14.8V LiPo Hard Case - UNI	25170	30C 3S 1300mAh 11.1V LiPo - HXT3.5 Super Tigre
15056	40C 2S 4000mAh 7.4V LiPo Hardcase ROAR - UNI 2.0-L	35000	15C 6S 22000mAh 22.2V LiPo
15057	40C 2S 5000mAh 7.4V LiPo Hardcase ROAR - UNI 2.0-L	35001	15C 6S 16000mAh 22.2V LiPo
15058	50C 2S 5000mAh 7.4V LiPo Hardcase ROAR - UNI 2.0-L	35002	15C 6S 13000mAh 22.2V LiPo

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ITEM	DESCRIPTION	ITEM	DESCRIPTION
15059	50C 3S 5000mAh 11.1V LiPo - UNI 2.0-L	35003	15C 6S 8000mAh 22.2V LiPo
15060	60C 2S 5000mAh 7.4V LiPo Hard Case ROAR - UNI	35004	15C 4S 16000mAh 14.8V LiPo
15061	60C 2S 5600mAh 7.4V LiPo Hard Case ROAR - UNI	35005	15C 4S 13000mAh 14.8V LiPo
15064	60C 2S 3800mAh 7.4V LiPo Hard Case Short Pack ROAR - UNI	35006	15C 4S 8000mAh 14.8V LiPo
15067	70C 2S 7000mAh 7.4V LiPo Hard Case - UNI	35007	15C 3S 16000mAh 11.1V LiPo
15068	70C 4S 6300mAh 14.8V LiPo Hard Case ROAR - UNI	35008	15C 3S 13000mAh 11.1V LiPo
15070	70C 2S 5300mAh 7.4V LiPo Hard Case ROAR - UNI	35009	15C 3S 8000mAh 11.1V LiPo
15071	70C 4S 5300mAh 14.8V LiPo Hard Case ROAR - UNI	35011	3S 6000mAh 11.1V LiPo - DJI Phantom 2
15072	70C 2S 5800mAh 7.4V LiPo Hard Case - UNI	35012	30C 1S 150mAh 3.7V LiPo - JST-MCX
15075	25C 2S 10000mAh 7.4V LiPo - UNI	35013	30C 1S 250mAh 3.7V LiPo
15079	70C 1S 6300mAh 3.7V LiPo Hard Case - UNI	35014	25C 1S 250mAh 3.7V LiPo
15080	30C 2S 5000mAh 7.4V LiPo Hardcase - UNI 2.0-L	35015	30C 1S 400mAh 3.7V LiPo
15081	35C 2S 3800mAh 7.4V LiPo Hard Case ROAR - UNI	35016	30C 1S 500mAh 3.7V LiPo
15083	30C 2S 4200mAh 7.4V LiPo Saddle Pack ROAR - UNI	35017	30C 1S 500mAh 3.7V LiPo
15084	40C 2S 5000mAh 7.4V LiPo Hardcase ROAR - UNI 2.0-L	35018	15C 1S 600mAh 3.7V LiPo - JST
15085	20C 2S 4000mAh 7.4V LiPo - UNI 2.0-L	35019	30C 1S 600mAh 3.7V LiPo
15086	50C 2S 5000mAh 7.4V LiPo Hardcase ROAR - UNI 2.0-L	35020	30C 2S 800mAh 7.4V LiPo
15087	50C 2S 5600mAh 7.4V LiPo Hard Case ROAR - UNI	35021	30C 3S 1350mAh 11.1V LiPo
15091	35C 2S 10000mAh 7.4V LiPo - UNI 2.0-L	35022	30C 3S 3300mAh 11.1V LiPo
15092	35C 2S 5200mAh 7.4V LiPo - UNI	35023	30C 3S 1400mAh 11.1V LiPo
15093	35C 2S 8000mAh 7.4V LiPo - UNI 2.0-L	35024	15C 3S 2200mAh 11.1V LiPo
15094	35C 3S 3300mAh 11.1V LiPo Hardcase - UNI 2.0-L	35025	15C 3S 4000mAh 11.1V LiPo
15096	DJI Phantom Battery by Venom 20C 3S 2200mAh 11.1V LiPo - UNI 2.0	35026	15C 3S 5400mAh 11.1V LiPo
15099	100C 2S 5000mAh 7.4V LiPo Hardcase ROAR - UNI	35027	10C 3S 6000mAh 11.1V LiPo - Yuneec Q500
15105	35C 3S 850mAh 11.1V LiPo - UNI	35028	8C 3S 5100mAh 11.1V LiPo
15106	35C 3S 1000mAh 11.1V LiPo - UNI	35029	30C 4S 1400mAh 14.8V LiPo
15107	35C 2S 2000mAh 7.4V LiPo - UNI 2.0-L	35030	15C 4S 3200mAh 14.8V LiPo
15108	35C 3S 1300mAh 11.1V LiPo - UNI 2.0-L	35031	15C 4S 4000mAh 14.8V LiPo
15112	35C 3S 5000mAh 11.1V LiPo Hardcase - UNI 2.0-L	35032	15C 6S 5000mAh 22.2V LiPo
15113	50C 3S 5000mAh 11.1V LiPo Hardcase - UNI 2.0-L	35033	3S 5500mAh 11.1V LiPo - DJI Phantom 2
15116	100C 2S 6000mAh 7.4V LiPo Hard Case ROAR - UNI	35034	25C 3S 5800mAh 11.1V LiPo
15117	100C 2S 7200mAh 7.4V LiPo Hard Case ROAR - UNI	35035	20C 3S 1600mAh 11.1V LiPo - Parrot Bebop

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ITEM	DESCRIPTION	ITEM	DESCRIPTION
15118	60C 2S 5500mAh 7.4v LiPo Saddle Pack ROAR - UNI	35036	15C 3S 7100mAh 11.1V LiPo - Blade Chroma
15119	100C 2S 5800mAh 7.4v LiPo Saddle Pack ROAR - UNI	35037	20C 3S 2200mAh 11.1V LiPo - Sensefly
15124	100C 2S 4500mAh 7.4v LiPo Shorty Pack ROAR - UNI	35038	20C 3S 5400mAh 11.1V LiPo - XT60
15125	65C 2S 4100mAh 7.4v LiPo Shorty Pack ROAR - UNI	35039	50C 3S 1000mAh 11.1V LiPo - UNI 2.0
15126	100C 2S 5800mAh 7.4v LiPo Square Pack ROAR - UNI	35040	50C 3S 1300mAh 11.1V LiPo - UNI 2.0
15127	60C 2S 5200mAh 7.4v LiPo Square Pack ROAR - UNI	35041	75C 3S 1300mAh 11.1V LiPo - UNI 2.0
15128	35C 3S 5000mAh 11.1V LiPo Hardcase - UNI 2.0-L	35042	50C 4S 1000mAh 14.8V LiPo - UNI 2.0
15129	50C 3S 5000mAh 11.1V LiPo Hardcase - UNI 2.0-L	35043	50C 4S 1300mAh 14.8V LiPo - UNI 2.0
15135	100C 3S 5000mAh 11.1V LiPo	35044	75C 4S 1300mAh 14.8V LiPo - UNI 2.0
15136	30C 3S 12000mAh 11.1V LiPo Air Pack Battery	35047	10C 3S 7100mAh 11.1V LiPo - Yuneec Q500
15137	30C 3S 16000mAh 11.1V LiPo Air Pack Battery	35048	20C 3S 2800mAh 11.1V LiPo - Parrot Bebop 2
15138	30C 4S 8000mAh 14.8V LiPo Air Pack Battery	35049	4S 6700mAh 14.8V LiPo - Yuneec Typhoon H
15139	30C 4S 12000mAh 14.8V LiPo Air Pack Battery	35050	15C 3S 800mAh 11.1V LiPo - Blade Inductrix 200
15140	30C 4S 16000mAh 14.8V LiPo Air Pack Battery	35051	25C 1S 800mAh 3.7V LiPo - Micro Losi/JST - Ominus
15141	30C 6S 8000mAh 22.2V LiPo Air Pack Battery	35052	25C 1S 1000mAh 3.7V LiPo - Micro Losi/JST - Vista
15142	30C 6S 12000mAh 22.2V LiPo Air Pack Battery	35053	50C 3S 850mAh 11.1V LiPo - UNI 2.0
15143	30C 6S 16000mAh 22.2V LiPo Air Pack Battery	35054	50C 3S 1800mAh 11.1V LiPo - UNI 2.0
15144	45C 6S 16000mAh 22.2V LiPo Air Pack Battery	35055	75C 3S 850mAh 11.1V LiPo - UNI 2.0
15145	45C 6S 22000mAh 22.2V LiPo Air Pack Battery	35056	75C 3S 1000mAh 11.1V LiPo - UNI 2.0
15146	20C 2S 210mAh 7.4v LiPo Air Pack Battery	35057	75C 3S 1800mAh 11.1V LiPo - UNI 2.0
15147	20C 2S 300mAh 7.4v LiPo Air Pack Battery	35058	50C 4S 850mAh 14.8V LiPo - UNI 2.0
15148	40C 2S 260mAh 7.4v LiPo Air Pack Battery - JST	35059	50C 4S 1800mAh 14.8V LiPo - UNI 2.0
15149	30C 2S 5000mAh 7.4V LiPo Hardcase ROAR - UNI 2.0-L	35060	75C 4S 850mAh 14.8V LiPo - UNI 2.0
15150	3S 5500mAh 11.1V Intelligent LiPo - DJI Phantom 2	35061	75C 4S 1000mAh 14.8V LiPo - UNI 2.0
15152	30C 6S 1300mAh 22.2V LiPo - EC3	35062	75C 4S 1800mAh 14.8V LiPo - UNI 2.0
15153	45C 6S 22000mAh 22.2V LiPo Air Pack Battery - XT150/AS150	35063X2	45C 1S 180mAh 3.7V LiPo - JST-MCX x2
15154	10C 6S 12000mAh 22.2V LiPo Air Pack Battery	35063X4	45C 1S 180mAh 3.7V LiPo - JST-MCX x4
15155	10C 6S 16000mAh 22.2V LiPo Air Pack Battery	35065X2	45C 1S 250mAh 3.7V LiPo - JST-MCX x2
15156	10C 6S 22000mAh 22.2V LiPo Air Pack Battery	35065X4	45C 1S 250mAh 3.7V LiPo - JST-MCX x4
15157	10C 3S 6000mAh 11.1V LiPo - Yuneec Q500	35066	15C 6S 22000mAh 22.2V LiPo Drone Pro Battery - XT90-S
15158	8C 3S 5100mAh 11.1V LiPo - XT80	35068	90C 3S 1300mAh 11.1V Graphene LiPo - UNI 2.0
15159	30C 3S 3000mAh 11.1V LiPo - EC3	35069	90C 3S 1500mAh 11.1V Graphene LiPo - UNI 2.0

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ITEM	DESCRIPTION	ITEM	DESCRIPTION
15160	100C 2S 5000mAh 7.4v Water Cooled LiPo Battery	35070	90C 4S 1300mAh 14.8V Graphene LiPo - UNI 2.0
15161	50C 2S 5000mAh 7.4v Water Cooled LiPo Battery	35071	90C 4S 1500mAh 14.8V Graphene LiPo - UNI 2.0
15162	100C 3S 5000mAh 11.1v Water Cooled LiPo Battery	35072	75C 4S 1500mAh 14.8V LiPo - UNI 2.0
15163	50C 3S 5000mAh 11.1v Water Cooled LiPo Battery	35073	75C 4S 850mAh 14.8V LiPo - XT30
15164	100C 4S 5000mAh 14.8v Water Cooled LiPo Battery	35074X4	30C 1S 220mAh 3.8V LiHV - JST-MCPX
15165	50C 4S 5000mAh 14.8v Water Cooled LiPo Battery	35075	20C 3S 4900mAh 11.1V LiPo - Sensefly SQ/Plus
15166	3S 6000mAh 11.1V Intelligent LiPo - DJI Phantom 2	35076	45C 2S 350mAh 7.4V LiPo - JST
15167	35C 1S 700mAh 3.7V LiPo - Mini Losi	35077	50C 2S 450mAh 7.4V LiPo - JST
15168	25C 1S 250mAh 3.7V LiPo - Mini Losi	35078	50C 2S 850mAh 7.4V LiPo - JST
15169	20C 3S 1800mAh 11.1V LiPo - Mini Tamiya	35079	30C 3S 450mAh 11.1V LiPo - JST
15170	50C 2S 2400mAh 7.4V LiPo - UNI	35080	70C 3S 450mAh 11.1V LiPo - JST
15171	50C 2S 4200mAh 7.4V LiPo - UNI	35081	75C 3S 650mAh 11.1V Graphene LiPo - XT30
15172	35C 2S 6600mAh 7.4V LiPo - UNI	35082	75C 4S 650mAh 14.8V Graphene LiPo - XT30
15173	50C 3S 5200mAh 11.1V LiPo - UNI 2.0-L	35083	75C 5S 1300mAh 18.5V LiPo - UNI 2.0
15174	3S 6000mAh 11.1V LiPo - DJI Phantom 2	35084	90C 5S 1300mAh 18.5V Graphene LiPo - UNI 2.0
15185	25C 2S 5000mAh 7.6V LiHV Hard Case - UNI	45000	35C 3S 1500mAh 11.1V LiPo - EC3
15186	25C 3S 5000mAh 11.4V LiHV Hard Case - UNI	45001	50C 3S 2200mAh 11.1V LiPo - EC3
15187	50C 3S 10500mAh 11.1V LiPo - UNI 2.0-TRX	45075	75C 3S 1300mAh 11.1V LiPo - Barbwire 2

