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PTM107399

SAFETY DATA SHEET

SDS according Commission Directive 91/155/EEC

Protective Clothing	NFPA Rating (USA)	EC Classification	WHMIS (Canada)	Transportation
Not required with normal use		**Not Classified as Dangerous**		**See Section 14**

Section 1: Product and Company Information

Product Name: High Power Lithium Ion Cell, Phosphate-Based

Product Code:
ANR26650M1A
APR18650M1A
APR18650M1HDA
AHR32113-Ultra-A
AHR32113-Ultra-B
AHR32157-M1-A
AHR32157-M1-B
AHP68150202-M1-A
AHP68150202-M1-B
AHP70161227-M1-A
AHP70165227-M1-A
AHR18700-M1-ULTRA-F1
AHR26700-M1-ULTRA-F1

Product Use: Electrical

Chemical Family: Mixture

Synonyms: High Power Lithium Ion Battery, Phosphate-Based

Manufacturer:
A123 Systems Inc.
Arsenal on the Charles
1 Kingsbury Ave
Watertown MA 02472

Phone Number: (617) 778-5700

Fax: (617) 778-5749

24-hour Emergency: Chemtrec: (800) 424-9300

Section 2: Composition and Ingredient Information

As a solid, manufactured article, exposure to hazardous ingredients is not expected with normal use.

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

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

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Section 3: Hazards Identification

Preparation Hazards and Classification:

Not dangerous with normal use. The battery should not be opened or burned. Exposure to the ingredients contained within or their combustion products could be harmful.

European Communities (EC): This product is not classified as dangerous according to Directive 1999/45/EC and its amendments. This product contains dangerous ingredients however, there is no expected release during use of the product and there is a barrier preventing exposure of the user and the environment.

Appearance, Color and Odor:

Solid object with no odor.

Primary Route(s) of Exposure:

These chemicals are contained in a sealed enclosure. Risk of exposure occurs only if the cell is mechanically, thermally or electrically abused to the point of compromising the enclosure. If this occurs, exposure to the electrolyte solution contained within can occur by Inhalation, Ingestion, Eye contact and Skin contact.

Potential Health Effects:

ACUTE (short term): see Section 8 for exposure controls

In the event that this battery has been ruptured, the electrolyte solution contained within the battery would be corrosive and can cause burns.

Inhalation: Inhalation of materials from a sealed battery is not an expected route of exposure. Vapors or mists from a ruptured battery may cause respiratory irritation.

Ingestion: Swallowing of materials from a sealed battery is not an expected route of exposure. Swallowing the contents of an open battery can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract.

Skin: Contact between the battery and skin will not cause any harm. Skin contact with contents of an open battery can cause severe irritation or burns to the skin.

Eye: Contact between the battery and the eye will not cause any harm. Eye contact with contents of an open battery can cause severe irritation or burns to the eye.

CHRONIC (long term): see Section 11 for additional toxicological data

Not applicable

Medical Conditions Aggravated by Exposure:

Not available

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Section 4: First Aid Measures

Inhalation: If contents of an opened battery are inhaled, remove source of contamination or move victim to fresh air. Obtain medical advice.

Eye Contact: If eye contact with contents of an open battery occurs, immediately flush the contaminated eye(s) with lukewarm, gently flowing water for at least 30 minutes while holding the eyelids open. Neutral saline solution may be used as soon as it is available. If necessary, continue flushing during transport to emergency care facility. Take care not to rinse contaminated water into the unaffected eye or onto face. Quickly transport victim to an emergency care facility.

Skin Contact: If skin contact with contents of an open battery occurs, as quickly as possible remove contaminated clothing, shoes and leather goods. Immediately flush with lukewarm, gently flowing water for at least 30 minutes. If irritation or pain persists, seek medical attention. Completely decontaminate clothing, shoes and leather goods before reuse or discard.

Ingestion: If ingestion of contents of an open battery occurs, NEVER give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Have victim drink 60 to 240 mL (2-8 oz.) of water. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Have victim rinse mouth with water again. Quickly transport victim to an emergency care facility.

Section 5: Fire Fighting Measures

Flammable Properties: In the event that this battery has been ruptured, the electrolyte solution contain within the battery would be flammable. Like any sealed container, battery cells may rupture when exposed to excessive heat; this could result in the release of flammable or corrosive materials.

Suitable extinguishing Media: Use water or appropriate ABC type extinguishers on fires relating to intact cells. If cell rupture occurs use an appropriate Class D extinguisher or other appropriate smothering agent. Class C fire extinguishers should be used to extinguish electrical fires.

Unsuitable extinguishing Media: Do not use water to extinguish electrical or ruptured cell related fires.

Explosion Data:

Sensitivity to Mechanical Impact: This may result in rupture in extreme cases.

Sensitivity to Static Discharge: Not applicable

Specific Hazards arising from the Chemical: The interaction of water and exposed lithium may result in the generation of hydrogen gas. Because hydrogen gas is explosive, battery-related fires in confined or poorly ventilated spaces should be controlled with appropriate smothering agents.

Protective Equipment and precautions for firefighters: As for any fire, evacuate the area and fight the fire from a safe distance. Wear a pressure-demand, self-contained breathing apparatus and full protective gear. Fight fire from a protected location or a safe distance.

NFPA

Health: 0
Flammability: 0
Instability: 0

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Section 6: Accidental Release Measures

Personal Precautions: Restrict access to area until completion of clean-up. Do not touch the spilled material. Wear adequate personal protective equipment as indicated in Section 8.

Environmental Precautions: Prevent material from contaminating soil and from entering sewers or waterways.

Methods for Containment: Stop the leak if safe to do so. Contain the spilled liquid with dry sand or earth. Clean up spills immediately.

Methods for Clean-up: Absorb spilled material with an inert absorbent (dry sand or earth). Scoop contaminated absorbent into an acceptable waste container. Collect all contaminated absorbent and dispose of according to directions in Section 13. Scrub the area with detergent and water; collect all contaminated wash water for proper disposal.

Section 7: Handling and Storage

Handling Do not open, dissemble, crush or burn battery. Do not expose battery to extreme heat or fire.

Storage: Store battery in a dry location. Keep at room temperature. Elevated temperatures can result in shortened battery life. Keep out of reach of children.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Use local exhaust ventilation or other engineering controls to control sources of dust, mist, fume and vapor.

Personal Protection:

Respiratory Protection: Not necessary under normal conditions.

Skin Protection: Not necessary under normal conditions. Wear neoprene or natural rubber gloves if handling an open or leaking battery.

Eye Protection: Not necessary under normal conditions. Wear safety glasses if handling an open or leaking battery.

Other Protective Equipment: Have a safety shower and eye-wash fountain readily available in the immediate work area.

Hygiene Measures: Do not eat, drink or smoke in work areas. Maintain good housekeeping.

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Section 9: Physical and Chemical Properties

Physical State:	Solid	**Vapor Pressure: (mm Hg @ 20°C)**	Not applicable
Appearance:	Battery	**Vapor Density: (Air = 1)**	Not applicable
pH:	Not applicable	**Solubility in Water:**	Insoluble
Relative Density: (water = 1)	Not available	**Water / Oil distribution coefficient:**	Not applicable
Boiling Point:	Not applicable	**Odor Type:**	Odorless
Melting Point:	Not applicable	**Odor Threshold:**	Not applicable
Viscosity:	Not applicable	**Evaporation Rate: (n-Butyl Acetate = 1)**	Not applicable
Oxidizing Properties:	Not applicable	**Auto Ignition Temperature (°C):**	Not applicable
Flash Point and Method (°C):	Not applicable	**Flammability Limits (%):**	Not applicable

Section 10: Stability and Reactivity

Stability: Stable

Conditions to Avoid: Avoid exposing the battery to fire or high temperature. Do not disassemble, crush, short or install with incorrect polarity. Avoid mechanical or electrical abuse.

Incompatible Materials: Not available

Hazardous Decomposition Products: This material may release toxic fumes if burned or exposed to fire.

Possibility of Hazardous Reactions: Not available

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Section 11: Toxicological Information

Irritation:	Risk of irritation occurs only if the cell is mechanically, thermally or electrically abused to the point of compromising the enclosure. If this occurs, irritation to the skin, eyes and respiratory tract may occur.
Sensitization:	Not available
Neurological Effects:	Not available
Teratogenicity:	Not applicable
Reproductive Toxicity:	Not applicable
Mutagenicity (Genetic Effects):	Not applicable
Toxicologically Synergistic Materials:	Not available

Section 12: Ecological Information

Ecotoxicity:	Not available
Mobility:	Not available
Persistence and degradability:	Not available
Bioaccumulative potential:	Not available
Other adverse effects:	Not available

Section 13: Disposal Considerations

Waste Disposal Method:	Battery recycling is encouraged. Do NOT dump into any sewers, on the ground or into any body of water. Store material for disposal as indicated in Section 7 Handling and Storage.
USA:	Dispose of in accordance with local, state and federal laws and regulations.
Canada:	Dispose of in accordance with local, provincial and federal laws and regulations.
EC:	Waste must be disposed of in accordance with relevant EC Directives and national, regional and local environmental control regulations. For disposal within the EC, the appropriate code according to the European Waste Catalogue (EWC) should be used.

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Section 14: Transport Information:

A123Systems lithium-ion cells and batteries are designed to comply with all applicable shipping regulations as prescribed by industry and legal standards which includes compliance with the UN Recommendations on the Transport of Dangerous Goods; IATA Dangerous Goods Regulations and applicable U.S. DOT regulations for the safe transport of lithium-ion batteries and the International Maritime Dangerous Goods Code. Each of the listed cells in Section 1 have passed the UN Manual of Tests and Criteria Part III Subsection 38.3, which is required by all of the directives listed above.

In the US, shipments of lithium ion cells and batteries are generally classified as Class 9, UN3090, Packing Group II, by the U.S. Hazardous Materials Regulations (HMR). Packaging, markings and documentation requirements are defined in the 49 CFR Section 173.185 of the U.S. HMR. Exceptions are made for cells that are less than 5 AH in nominal capacity rating. This includes the following listed cells from Section 1.

- ANR26650M1A, APR18650M1A, APR18650M1HDA, AHR32113-Ultra-A, AHR32113-Ultra-B, AHR18700-M1-ULTRA-F1, AHR26700-M1-ULTRA-F1

Exceptions also are made for batteries that contain less than the interconnected number of cells which together amount to less than 26.7 AH. This includes any product that contains less than the following number of interconnected cells listed in Section 1:

- 24 of either APR18650M1A or APR18650M1HDA
- 11 of ANR26650M1A
- 6 of either AHR32113-Ultra-A or AHR32113-Ultra-B
- 38 of AHR18700-M1-ULTRA-F1
- 19 of AHR26700-M1-ULTRA-F1

Excepted cells and batteries are allowed to be transported within the US without Class 9 packaging and markings, but must conform to other requirements as stipulated in Special Provisions 188 and 189 in the 49 CFR Section 173.185 of the U.S. HMR.

International shipments of lithium ion cells and batteries are generally classified as Class 9, UN3480, Packing Group II, by the International Civil Aviation Organization (ICAO) and as Class 9, UN3090, Packing Group II by the International Maritime Dangerous Goods (IMDG) Code. Packaging, markings and documentation requirements are defined in the International Air Transport Association (IATA) Dangerous Goods Regulations (DGR) Packing Instructions 965 and the IMDG Code. Partial exceptions are made for cells that are less than 20 WH in nominal energy rating. This includes the following listed cells from Section 1.

- ANR26650M1A, APR18650M1A, APR18650M1HDA, AHR32113-Ultra-A, AHR32113-Ultra-B, AHR18700-M1-ULTRA-F1, AHR26700-M1-ULTRA-F1

Partial exceptions also are made for batteries that contain less than the interconnected number of cells which together amount to less than 100 WH of nominal energy rating. This includes any product that contains less than the following number of interconnected cells listed in Section 1:

- 27 of either APR18650M1A or APR18650M1HDA
- 14 of ANR26650M1A
- 7 of either AHR32113-Ultra-A or AHR32113-Ultra-B
- 43 of AHR18700-M1-ULTRA-F1
- 21 of AHR26700-M1-ULTRA-F1

Excepted cells and batteries are allowed to be transported internationally without Class 9 packaging and markings, but must conform to other requirements as stipulated in Part 1 of Packing Instructions 965 in the 50th editions of the IATA DGR and Special Provision 188 under the IMDG Code.

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Section 15: Regulatory Information

USA

TSCA Status: All ingredients in the product are listed on the TSCA inventory.

SARA Title III:

Sec. 302/304:	None
Sec: 311/312:	None
Sec. 313:	None
CERCLA RQ	None

California Prop 65 : This product does not contain chemicals known to the State of California to cause cancer or reproductive toxicity.

Canada This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations* and the MSDS contains all the information required by the *Controlled Products Regulations*.

WHMIS Classification: Not Controlled

New Substance Notification Regulations: Lithium hexafluorophosphate is listed on the NDSL. All other ingredients in the product are listed, as required, on Canada's Domestic Substances List (DSL).

NPRI Substances: This product does not contain any NPRI chemicals.

EC Classification for the Substance/Preparation:

Symbol: This product is not classified as dangerous according to Directive 1999/45/EC and its amendments.

Risk Phrases: None

Safety Phrases: S2: Keep out of the reach of children.

Section 16: Other Information

Preparation Information:

Revision Date: April 7, 2009

Revision Summary:

June 12, 2006: Updated Section 7.
November 2, 2006: Added new product code, Section 1.
March 27, 2007: Added new product codes, Section 1.
August 13, 2007: Updated fire extinguishing methods, Section 5.
September 10, 2007: Updated transportation information, Section 14.
December 17, 2007: Added new product codes, Added codes in Section 14.
April 3, 2008: Added new product code, Section 1.
July 8, 2008: New product codes, Section 1.
January 13, 2009: Update Sections 1 & 14.
February 25, 2009: Added new product code, Section 1.
April 6, 2009: Update Sections 1 & 14.

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Manufacturer Disclaimer: The information and recommendations set forth are made in good faith and believed to be accurate at the date of preparation.