Material/Product Safety Data Sheet (MSDS-PSDS)

Date: 12/01/10

1. Identification of the product and supplier

Identification of the product:	Primary Lithium/Thionyl chloride unit cells and multi-cell battery packs (Li–$SOCl_2$) non-rechargeable batteries
Manufacturer:	AA Portable Power Corp
Address:	860S 19th St, UnitA, Richmond, CA, 94804
Telephone:	510-525-2328
Fax:	510-439-2808
E-mail:	sales@batteryspace.com

2. Composition and information about the ingredients

Each cell consists of an hermetically sealed metallic container containing a number of chemicals and materials of construction of which the following could potentially be hazardous upon release.

	Appr . Percent of Total Weight (%)	Chemical Abstracts Service #	CHIP Classification
Lithium (Li)	3.0～4.1	7439-93-2	 
Thionyl chloride ($SOCl_2$)	39.2～45.5	7719-09-7	  
Aluminum chloride anhydrous ($AlCl_3$)	1～4.9	7446-70-0	
Carbon (C)	2.8～3.6	1333-86-4	NONE KNOWN
Amount varies depending on cell size			

3. Hazards identification

Do not short circuit, recharge, puncture, incinerate, crush, immerse, force discharge or expose to temperatures above the declared operating temperature range of the product. Risk of fire or explosion. The Lithium-Thionyl chloride batteries described in this Product Safety Data Sheet are sealed units which are not hazardous when used according to the recommendations of the manufacturer.

Under normal conditions of use, the electrode materials and electrolyte they contain are not exposed to the outside, provided the battery integrity is maintained and seals remain intact. Risk of exposure only in case of abuse (mechanical, thermal, electrical) which leads to the activation of safety valves and/or the rupture of the battery containers. Electrolyte leakage or battery vent/explosion/fire may follow, depending upon the circumstances.

4. First aid measures

Inhalation: Remove from exposure, rest and keep warm, In severe cases obtain medical attention.

Skin contact: Wash off skin thoroughly with tap water. Remove contaminated clothing and wash before reuse. In severe cases obtain medical attention.

Eye contact: Irrigate thoroughly with water for at least 15 minutes. Obtain medical attention

Ingestion: Wash out mouth thoroughly with water and give plenty of water to drink. Obtain medical attention.

Further treatment: All cases of eye contamination, persistent skin irritation and casualties who have swallowed this substance or been affected by breathing its vapours should be seen by a Doctor.

5. Fire-fighting measures

CO_2 extinguishers or copious quantities of water-based foam can be used to cool down burning Li-$SOCl_2$ cells and batteries, as long as the extend of the fire has not progressed to the point that the Lithium metal they contain is exposed.

Do not use for this purpose sand, dry powder or soda ash , graphite powder or fire blankets.

Use only metal (Class D) extinguishers on raw lithium.

Extinguishing Media: Use water or CO_2 on burning Li-$SOCl_2$ cells or batteries and class D fire extinguishing agent only on raw lithium.

6. Accidental release measures

Do not breathe vapours or touch liquid with bare hands.

If the skin has come into contact with the electrolyte it should be washed thoroughly with water.

Earth or sand should be used to absorb the exudation, seal leaking battery and earth in a heavy duty polythene bag and dispose of as Special Waste in accordance with local regulations.

7. Handling and storage

Handling: Do not crush, pierce, short (+) and (-) battery terminals with conductive (i.e. metal) goods. Do not directly heat or solder. Do not throw into fire.
Do not mix batteries of different types and brands. Do not mix new and used batteries. Keep batteries in non conductive (i.e. plastic) trays.

Storage: Store in a cool (preferably below 30°C) and ventilated area, away from moisture, sources of heat, open flames, food and drink. Keep adequate clearance between walls and batteries. Temperature above 100°C may result in battery leakage and rupture. Since short circuit can cause burn, leakage and rupture hazard, keep batteries in original packaging until use and do not jumble them.

Other: Lithium-Thionyl chloride batteries are not rechargeable and should not be tentatively charged.
Follow Manufacturers recommendations regarding maximum recommended currents and operating temperature range.
Applying pressure on deforming the battery may lead to disassembly followed by eye, skin and throat irritation.

8. Exposure controls/personal protection

	Occupational exposure standard	Compound Sulfur dioxide Hydrogen chloride	8hr TWA 1 ppm 1 ppm	15min TWA 1 ppm 5 ppm	SK - -
	**Respiratory protection**	**In all fire situations, use self-contained breathing apparatus.**			
	**Hand protection**	**In the event of leakage wear gloves.**			
	**Eye Protection**	**Safety glasses are recommended during handling**			
	**Other**	**In the event of leakage, wear chemical apron.**			

9. Physical and chemical properties

Appearance: Cylindrical shape

Odour: If leaking, gives off a pungent corrosive odour.

pH: Not applicable .

Flash Point: Not applicable unless individual components exposed.

Flammability: Not applicable unless individual components exposed.

Relative density: Not applicable unless individual components exposed

Solubility (water): Not applicable unless individual components exposed

Solubility (other): Not applicable unless individual components exposed

10. Stability and reactivity

Product is stable under conditions described in Section 7.

Conditions to avoid: Heat above 100°C or incinerate. Deform. Mutilate. Crush. Pierce. Disassemble Recharge. Short circuit. Expose over a long period to humid conditions.

Materials to avoid: Oxidising agents, alkalis, water. Avoid electrolyte contact with aluminum or zinc.

Hazardous decomposition Products : Hydrogen (H_2) as well as Lithium oxide (Li_2O) and Lithium hydroxide (LiOH) dust is produced in case of reaction of lithium metal with water.
Chlorine (Cl_2), Sulfur dioxide (SO_2) and Disulfur dichloride (S_2Cl_2) are produced in case of thermal decomposition of *thionyl chloride* above 140°C.
Hydrochloric acid (HCl) and Sulfur dioxide (SO_2) are produced in case of reaction of *Thionyl* chloride with water at room temperature.
Hydrochloric acid (HCl) fumes, Lithium oxide, (Li_2O), Lithium hydroxide (LiOH) and Aluminum hydroxide ($Al(OH)_3$) dust are produced in case of reaction of Lithium tetrachloroaluminate (LiAlCl4) with water.

11. Toxicological information

Signs & symptoms: None, unless battery ruptures. In the event of exposure to internal contents, corrosive fumes will be very irritating to skin, eyes and mucous membranes. Overexposure can cause symptoms of non-fibrotic lung injury and membrane irritation.

Inhalation: Lung irritant.

Skin contact: Skin irritant

Eye contact: Eye irritant

Ingestion: Tissue damage to throat and gastro-respiratory tract if swallowed.

Medical conditions generally aggravated by exposure: In the event of exposure to internal contents, eczema, skin allergies, lung injuries, asthma and other respiratory disorders may occur.

12. Ecological information

Mammalian effects: None known if used/disposed of correctly.

Eco-toxicity: None known if used/disposed of correctly.

Bioaccumulation potential: None known if used/disposed of correctly.

Environmental fate: None known if used/disposed of correctly.

13. Disposal consideration

Do not incinerate, or subject cells to temperature in excess of 100°C, Such abuse can result in loss of seal, leakage, and/or cell explosion. Dispose of in accordance with appropriate local regulations.

14. Transport information

Restriction for the transport: Codes and classifications according to the United Nation Regulations.

Label for conveyance:For the single cell batteries and multicell battery packs which are restricted to transport(assigned to the Miscellaneous Class 9),use Class 9 Miscellaneous Dangerous Goods and UN Identification Number labels.
The UN classification number: Class 9 UN3090. Shipping name: Lithium Metal Batteries.
In all cases,refer to the product transport certificate issued by the authorized laboratories.

Packing Group: II
IMDG Code:9033
CAS:
EmS No: 4.1-06
Marine pollutant: None
ADR class: Class 9

Also these batteries and cells have been approved UN manual of test and criteria, part III, sub-section 38.3. And its does not contains any recalled/ defective battery.

Note: For the single cell batteries and multicell battery packs which contain few than 1.0g (single cell) or 2.0g(multicell battery packs) of metal lithium are not restricted for transport.

15. Regulation information

Here below are shown the nature of special risks and the advices of caution.

Risk phrases	**Lithium**	**R14/15** **R21** **R22** **R35** **R41** **R42/43**	**Reacts violently with water, liberating extremely flammable gases.** **Harmful in contact with skin.** **Harmful if swallowed.** **Causes burns.** **Risk of serious damage to eye.** **May cause sensitization by inhalation and skin contact.**
	Thionyl chloride ($SOCl_2$)	**R14 R22** **R35 R37** **R41** **R42/43**	**Reacts with water.** **Harmful if swallowed.** **Causes burns.** **Irritating to respiratory system.** **Risk of serious damage to eye.** **May cause sensitization by inhalation and skin contact.**
	Aluminum chloride anhydrous ($AlCl_3$)	**R14 R22** **R37 R41** **R43**	**Reacts with water.** **Harmful if swallowed.** **Irritating to respiratory system.** **Risk of serious damage to eye.** **May cause sensitization by skin contact.**

Safety phrases	**Lithium (Li)**	**S2 S8 S45**	**Keep out of reach of children Keep away from moisture In case of incident, seek medical attention**
	Thionyl chloride ($SOCl_2$)	**S2 S8 S24 S26 S36 S37 S45**	**Keep out of reach of children. Keep away from moisture. Avoid contact with skin. In case of contact with eyes, rinse immediately with plenty of water. Wear suitable protective clothing. Wear suitable gloves. In case of incident, seek medical attention.**
	Aluminum chloride anhydrous ($AlCl_3$)	**S2 S8 S22 S24 S26 S36**	**Keep out of reach of children. Keep away from moisture. Do not breathe dust. Avoid contact with skin. In case of contact with eyes, rinse immediately with plenty of water. Wear suitable protective clothing.**
UK regulatory references	**Classified under CHIP**		

16. Other information

This information has been compiled from sources considered to be dependable and is, to the best of our knowledge and belief, accurate and reliable as of the date compiled, However, no representation, warranty (either expressed or implied) or guarantee is made to the accuracy, reliability, or completeness of the information contained herein.

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