

MATERIAL SAFETY DATA SHEET

Section 1: Chemical Product and Company Identification

Part Number:	U-S128DG-52
Description:	Lithium ion rechargeable battery
Customer Description:	N/A
Customer Part Number:	N/A
National Stock Code:	N/A

Manufactured by:	axcom Battery Technology Carl-Friedrich-Benz Str.15 47877 Willich, Germany
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Emergency Telephone Number:	
USA	+49(0)215448380
International	+49(0)215448380
Technical Contact Telephone Number	+49(0)215448380

MSDS Prepared by:	Ricky Lee
Date Prepared:	01 JANUARY 2016
Date Reviewed:	01 JANUARY 2017

Section 2: Composition/Information on Ingredients

Chemical Name	CAS #	Percent of Content
Lithium Cobalt Oxide	12190-79-3	25-40
Iron	7439-89-6	15-25
Aluminum	7429-90-5	2-6
Graphite		
Natural	7782-42-5	10-20
Artificial	7740-44-0	
Copper	7440-50-8	5-15
Organic Electrolyte		10-20

Section 3: Hazards Identification

Emergency Overview: Caution, do not open or disassemble. Do not expose to fire or open flame. Do not mix with batteries of varying sizes, chemistries or types. Do not puncture, deform incinerate or heat above 60 °C.

Potential Health Effects: The materials contained in this battery may only represent a hazard if the integrity of the battery is compromised or if the battery is physically or electrically abused. **Acute exposure:** Electrolyte may irritate skin and eyes.

Section 4: First Aid Measures

If materials from a ruptured or otherwise damaged cell or battery contact skin, flush immediately with water and wash affected area with soap and water. For eye contact, flush with copious amounts of water for 15 minutes and see physician at once. Avoid inhaling any vented gases. If irritation persists, seek medical assistance.

Section 5: Fire Fighting Measures

Extinguishing Media: Dry chemical type extinguishers or water are the most effective means to extinguish a cell or battery fire. A CO extinguisher will also work effectively.

Fire Fighting Procedures: Use a positive pressure self-contained breathing apparatus if batteries are involved in a fire. Full protective clothing is necessary. During water application, caution is advised as burning pieces of flammable particles may be ejected from the fire.

Unusual Fire and Explosion Hazards: Cells or batteries may flame or leak potentially hazardous organic vapors if exposed to excessive heat or fire.

Hazardous Combustion Products: Fire, excessive heat, or over voltage conditions may produce hazardous decomposition products.

Damaged or opened cells or batteries can result in rapid heating and the release of flammable vapors. Vapors may be heavier than air and may travel along the ground or be moved by ventilation to an ignition source and flash back.

Section 6: Accidental Release Measures

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

Section 7: Handling and Storage

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

Never disassemble a battery or bypass any safety device.

Should a battery unintentionally be crushed, thus releasing its contents, rubber gloves must be used to handle all battery components. Avoid inhalation of any vapors that may be emitted.

In the event of skin or eye exposure to the electrolyte, refer to Section 4, First Aid Information.

Batteries should be separated from other materials and stored in a non-combustible, well ventilated, sprinkler-protected 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 or below -32°C. Store batteries in a cool (below 21°C (70°F)), dry area that is subject to little temperature change. Elevated temperatures can result in reduced battery service life. Battery exposure to temperatures in excess of 130°C will result in the battery venting flammable liquid and gases.

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

Section 8: Exposure Controls/Personal Protection

No engineering controls are required for handling batteries that have not been damaged.

Personal protective equipment for damaged batteries 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

Not Applicable

Section 10: Stability and Reactivity

- (1) This product is stable under ordinary conditions of use and storage.
- (2) It is not recommended that this product be stored above 60°C (140°F).
- (3) Hazardous decomposition products: Carbon Monoxide (CO) and other Volatile Organic Compounds.

Section 11: Toxicological Information

- (1) Irritancy: The electrolytes contained in this battery can irritate eyes with any contact. Prolonged contact with the skin or mucous membranes may cause irritation.
- (2) Sensitization: No information is available at this time.
- (3) Carcinogenicity: No information is available at this time.
- (4) Reproductive toxicity: No information is available at this time.
- (5) Teratogenicity: No information is available at this time.
- (6) Mutagenicity: No information is available at this time.

Section 12: Ecological Information

Not applicable to this material/product.

Section 13: Disposal Considerations

To prevent short circuit, batteries should be completely discharged prior to disposal, terminal taped and/or capped. When completely discharged it is not considered hazardous.

This product does not contain any materials listed by the United States EPA as requiring specific waste disposal requirements. These are exempted from the hazardous waste disposal standards under Universal Waste Regulations. Disposal of large quantities of Lithium Ion batteries or cells may be subject to Local, State or Federal / Provincial regulations. Consult your Local, State and Federal / Provincial regulations regarding disposal of these batteries.

Section 14: Transport Information

(1) Product is shipped as:

Ground (DOT)	Air (IATA/ICAO)	Sea (IMDG)
Non-Hazardous by ground	UN3480 Lithium ion Batteries – Not restricted	UN3480 Lithium ion Batteries – Not restricted
	UN3481 “Lithium ion Batteries contained in equipment” or “Lithium ion batteries packed with equipment” – Not restricted	UN3481 “Lithium ion Batteries contained in equipment” or “Lithium ion batteries packed with equipment” – Not restricted

(2) Special shipping information. These batteries have been tested to Section 38.3 of ‘UN Manual of Test and Criteria’. Declares that all lithium ion and lithium polymer batteries do not contain more than:

- 20Wh ELC (Equivalent Lithium Contents) for each cell inside battery.
- 100Wh ELC (Equivalent Lithium Contents) for each battery.

It is below the limits set by the 2017 IATA Dangerous Goods Regulations 58TH edition Packing Instruction 965 Section II (When batteries are packaged with equipments or contained in equipments, refer packing instruction 966 or 967 instead of 965) is applied. And they are out of scope for Special Provision A154. Also the consignment complies with the current edition –58TH 2017 of the IATA regulation and complied with Special Provision 188.

- 1) Section II of Packing Instruction – PI965 for Lithium Ion Batteries (UN3480)
- 2) UN manual of Tests and Criteria, Part III, sub-section 38.3 (withstanding a 1.2m drop test);
- 3) Watt-hour rating is not more than 100 Wh which shown on the batteries.
- 4) Labelled with a lithium battery handling label
- 5) Package permissible gross weight has been observed (Passenger/Cargo Aircraft is 10Kg Gross)

In the case of transportation, avoid exposure to high temperature and prevent the formation of any condensation. Take in a cargo of them without falling, dropping and breakage. Prevent collapse of cargo piles and wet by rain. The container must be handled carefully. Do not give shocks that result in a mark of hitting on a cell. Please refer to Section 7-HANDLING AND STORAGE also.

UN regulation

- Un number: 3480 (3481 when the battery is contained in equipment or packed with equipment)
- Proper shipping name:
Lithium ion batteries (“lithium ion batteries contained in equipment” or “lithium ion packed with equipment”)
- Class: 9 *
- Packing group:

** Although this product meets the criteria of *dangerous goods and are classified as “lithium ion batteries”, depending on the battery’s total capacity in the packaging, etc., they may not be subject to the fully regulated provisions.*

Regulation depends on region and transportation mode

- Worldwide - Air transportation:
ICAO/IATA-DGR [packing instruction 965 section 1B or II]
(When shipping batteries “packed with” or “contained in” equipment, use packing instruction 966 or 967 as appropriate.)
- Worldwide - Ocean transportation:
IMO-IMDG Code [special provision 188]
- Europe - Ground transportation:
ADR [special provision 188]

** Instruction or provisions in the box brackets are conditions to make the battery cell exempted from full regulation.*

Section 15: Regulatory Information

Regulations specifically applicable to the product:

- IATA-DGR (air transportation)
- IMO-IMDG Code (sea transportation)
- US Department of Transportation 49 Code of Federal Regulations [USA]

Section 16: Other Information

The information contained herein is 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.

Model No.	ELC / cell (g)	Aggregated ELC (g)	Specifications
NL560B.082	0.645	5.16	4S2P ,65Wh , Li- ion, 14.4V, 4500mAh
PLC706D.806	0.765	3.06	2S2P ,87Wh , Li- ion, 7.2V, 5200mAh