Tadiran
Batteries GmbH
Industriestrasse 22
D-63654 Büdingen

Revised 2012-11-20

Distribution Class 1 General

Technical Notice

Lithium Battery Information Sheet

1. Identification

1.1	Product Name:	Tadiran High Energy Lithium Battery, or Sonnenschein Lithium Inorganic Lithium Battery
	Voltage:	3.6 Volts
	Chemistry System:	Lithium thionyl chloride
	Anode:	Lithium metal
	Cathode:	Liquid, thionyl chloride
1.2	Company: Adress:	Tadiran Batteries GmbH Industriestr. 22 63654 BÜDINGEN Germany Tel.: +49(0)6042-954-0 Fax: +49(0)6042-954-190 Web: www.tadiranbatteries.de
1.3	Emergency Telephone Number:	+49(0)6042/954-599
	Note:	This information sheet refers to cells and batteries assembled from them

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2. Hazards Identification

Warning: Fire, explosion, and severe, burn hazard. Do not recharge, disassemble, heat above 100 °C (series SL-500: 150 °C), incinerate, or expose contents to water.

Protection from charging:

Whenever lithium batteries are not the single power source in a circuit the following measures recommended by Underwriters Laboratories are relevant. The cells should not be connected in series with an electrical power source that would increase the forward current through the cells.

The circuit for these cells shall include one of the following:

A. Two suitable diodes or the equivalent in series with the cells to prevent any reverse (charging) current. The second diode is used to provide protection in the event that one should fail. Quality control, or equivalent procedures, shall be established by the device manufacturer to ensure the diode polarity is correct for each unit,

or

B. A blocking diode or the equivalent to prevent any reverse (charging) current and a resistor to limit current in case of a diode failure. The resistor should be sized to limit the reverse charging) current to the maximums given in the data sheets.

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3. Composition/Information on Ingredients

Substance	CAS No.	Approximate percent of total weight	Hazard symbol	R-phrases
Lithium Metal	7439-93-2	2 - 6	F, C	14/15-34
Thionyl Chloride	7719-09-7	18 - 47	C	14-34-37
Aluminium Chloride	7446-70-0	2 - 5		
Lithium Chloride	7447-41-8	1 - 2		
Carbon	7440-44-0	2 - 5		
Steel, Nickel plated	----	35 - 73		
Glass	----	0 - 2		
PVC	9002-86-2	0 - 1		
PMMA	9011-14-7	0 - 1		
PTFE	9002-84-0	0 - 1		

Hazard Symbols:	C	Corrosive
	F	Highly flammable
R-Phrases:	R 14	Reacts violently with water
	R 14/15	Reacts violently with water liberating extremely flammable gases
	R 34	Causes burns
	R 37	Irritating to respiratory system

Important Note: The material in this section may only represent a hazard if the integrity of the battery is compromised, or if the battery is physically or electrically abused.

4. First Aid Measures

A. Electrolyte Contact

- Skin: Immediately flush with plenty of water for at least 15 minutes. If symptoms are present after flushing, get medical attention.
- Eyes: Immediately flush with plenty of water for at least 15 minutes and get medical attention.
- Respiratory system: With large quantities and irritation of the respiratory tract medical surveillance for 48 hours.

  Immediately inhale Cortisone Spray, e.g. Pulmicort.

B. Lithium Metal Contact

- Skin: Remove particles of lithium from skin as rapidly as possible. Immediately flush with plenty of water for at least 15 minutes and get medical attention.
- Eyes: Immediately flush with plenty of water for at least 15 minutes and get immediate medical attention.

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5. Fire - fighting measures

A. Extinguishing Media

- During a fire with lithium batteries, copious amounts of cold water is an effective medium to prevent expansion of the fire. Do not use warm water or hot water.
- Lith-X (Class D extinguishing media) is effective on fires involving only a few lithium batteries.
- Do not use CO_2 or Halon type extinguishers.
- Dry chemical type extinguishers have limited extinguishing potential.

B. 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 lithium may be ejected from the fire.
- Where the cells or batteries are not at the centre of the fire copious amounts of water may be supplied to the cells using a diffuser type nozzle so that the cells remain cool during the containment and extinguishing of the fire. A sprinkler system should be sufficient for this purpose the critical factor being that the lithium cells do not experience temperatures above the melting point of lithium.
- Small amounts of water should never be used such as the volumes contained within portable fire extinguishers. Standard dry powder extinguishers are ineffective. Halon extinguishers must not be used when fighting lithium fires as toxic gases may be generated during fire fighting. It should be noted that a hazard of hydrogen formation exists whenever hot lithium metal comes into contact with water.

6. Accidental release measures

When the battery housing is damaged, small amounts of electrolyte may leak. Seal battery air tight in a plastic bag, adding some chalk ($CaCO_3$) or lime (CaO) powder or Vermiculite.

Electrolyte traces may be wiped off dryly using household paper. Rinse with water afterwards.

7. Handling and Storage

- Do not allow terminals to short-circuit.
- Storage preferably in a cool (below 21 °C), dry area that is subject to little temperature change.
- Do not place near heating equipment, nor expose to direct sunlight for long periods. Elevated temperatures can result in reduced battery service life.

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8. Exposure controls / personal protection

Lithium batteries are products, from which no substance is released under normal and reasonably foreseeable conditions of use.

9. Physical and chemical properties

Refer to information under item 3.

10. Stability and reactivity

May rupture violently when heated above 150 °C or when charged.

11. Toxicological information

Not applicable

Refer to information under item 3.

12. Ecological information

The batteries do not contain mercury, cadmium or other heavy metals.

13. Disposal Considerations

- Batteries do not contain hazardous materials according to EC directives 91/157/EEC, 93/86/EEC, and 2011/65/EU (RoHS directive)
- EC battery directive 2006/66/EC has been implemented by most EC member states.
- According to the EU Battery Dírective, Batteries are marked with the symbol of the crossed-out wheeled bin (see figure). The symbol reminds the end user that batteries are not permitted to be disposed of with household waste, but must be collected separately.

- Waste Batteries must effectively be protected against short circuit during storage and transport.
- A disposal service is offered upon request by Tadiran Batteries.
- For additional information a Technical Notice is available upon request

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14. Transport information

Class 9

UN 3090:	LITHIUM METAL BATTERIES
UN 3091:	LITHIUM METAL BATTERIES CONTAINED IN EQUIPMENT, or LITHIUM METAL BATTERIES PACKED WITH EQUIPMENT
Packing group:	II

Special provisions and packing instructions:

ADR, RID:	188, 230, 310, 636, 656, P903, P903a, P903b
IATA:	A48, A88, A99, A154, A164, A181, A182, A183, P968, P969, P970
IMDG-Code:	188, 230, 310, P903 EmS: F-A, S-I Storage and segregation: Category A

For more information see www.tadiranbatteries.de > products > Transport Regulations

15. Regulatory information

Transport Regulations: see in section 14
EU Battery Directive: see in section 13

16. Other information

- Tadiran Lithium Batteries are registered by Underwriters Laboratories, Northbrook, U.S.A. under file MH 12827.
- Further information is given in
  - Tadiran Lithium Battery Product Data Catalogue
  - Tadiran Lithium Battery Technical Brochure.
- For lithium batteries in general, Safety standard IEC 60086-4 applies. It contains detailed recommendations for manufacturers of equipment and users.
- Battery packs
  The design and assembly of battery packs require special skills, expertise and experience. Therefore it is not recommended that the end user attempt to self-assemble battery packs. It is preferable that any battery using lithium cells be fabricated by TADIRAN to ensure proper battery design and construction. A full battery assembly service is available from TADIRAN who can be contacted for further information. If for any reason, this is not possible, TADIRAN can review the pack design in confidence to ensure that the design is safe (in assembly and use) and capable of meeting stated performance requirements.

The REACH regulation (1907/2006/EC) has replaced the EU directive for safety data sheets (91/155/EU). Both the now valid REACH regulation and the no longer valid directive require safety data sheets to be created and updated for materials and preparations. For products - including lithium batteries - no EU safety data sheets are required according to European chemicals regulations.

The information contained herein is furnished without warranty of any kind. Users should consider these 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.