

Material Safety Data Sheet

Model No.: T Series Li-ion Rechargeable Cells

IDENTITY (As Used on Label and List) Lithium Ion cell	Note: Blank spaces are not permitted if any item is not applicable or no information is available, the space must be marked to indicate that.
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Section I – Information of Manufacturer

Manufacturer's Name	ENIX ENERGIES
Address (Number, Street, City State, and ZIP Code) 27, rue des Glairaux - BP231 38522 SAINT-EGREVE	Telephone Number for information Tel: 0825 88 65 11
	Date of prepared and revision Jan 18, 2010

Section II – Information on Ingredients

Description:	CAS#	Approximate % of total weight
Aluminum	7429-90-5	3-6%
Artificial Graphite	7740-44-0	16-20%
Copper	7440-50-8	7-10%
Iron	7439-89-6	15-25%
Lithium Mixed Metal Oxide (LiMO ₂)	N.A.	30-50%
Lithium Cobaltate (LiCoO ₂)	12190-79-3	0-10%
Lithium Manganate (LiMn ₂ O ₄)	12057-17-9	0-10%
Organic electrolyte	N.A.	10-20%

M = One metal or a combination of metals (Co, Mn, Ni or Al)

Section III - Physical / Chemical Characteristics

Boiling Point N.A.	Specific Gravity (H ₂ O=1) N.A.
Vapor Pressure (mm Hg) N.A.	Melting Point N.A.
Vapor Density (AIR=1) N.A.	Evaporation Rate (Butyl Acetate) N.A.
Solubility in Water N.A.	
Appearance and Odor Cylindrical or prismatic shape, odorless	

Section IV – Hazard Classification

During normal use, no physical danger of ignition or explosion and chemical danger of leakage of hazardous material. In the condition of over-abusive use, the safety vent will open. Hence, hazardous materials may come out.

If the electrolyte reacts with water, it will generate hydrogen fluoride. Do not expose to fire, as the leaked electrolyte is inflammable substance.

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Section V – Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable	X	

Incompatibility (Materials to Avoid)

Hazardous Decomposition or Byproducts

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	X	

Section VI - Health Hazard Data

Route(s) of Entry	Inhalation?	Skin?	Ingestion?
	N.A.	N.A.	N.A.

Health Hazard (Acute and Chronic) / Toxicological information

- In case of electrolyte leakage, skin will be itchy when contaminated with electrolyte.
- In contact with electrolyte can cause severe irritation and chemical burns.
- Inhalation of electrolyte vapors may cause irritation of the upper respiratory tract and lungs.
- In case of electrolyte vapor or splash, eye contact causes inflammation.

Section VII – First Aid Measures

First Aid Procedures

- 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 for fifteen (15) minutes, and contact a physician.
- If electrolyte vapors are inhaled, provide fresh air and seek medical attention if respiratory irritation develops. Ventilate the contaminated area.

Section VIII - Fire and Explosion Hazard Data

Flash Point (Method Used)	Ignition Temp.	Flammable Limits	LEL	UEL
N.A.	N.A.	N.A.	N.A.	N.A.

Extinguishing Media

Carbon Dioxide, Dry Chemical or Foam extinguishers can be used for battery BUT water extinguisher is not suitable.

Special Fire Fighting Procedures

N.A.

Unusual Fire and Explosion Hazards

- Do not dispose of battery in fire - may explode.
- Do not short-circuit battery - may cause burns.

Section IX – Measures for fire extinction

In case of fire, it is permissible to use Carbon Dioxide, Dry Chemical or Foam extinguishers on these cells or their packing material. Cool exterior of cells if exposed to fire to prevent rupture. Fire fighters should wear self-contained breathing apparatus.

Section X – Accidental Release or Spillage

Steps to Be Taken in Case Material is Released or Spilled

Cells that are leakage should be handled with rubber gloves.

Avoid direct contact with electrolyte.

Wear protective clothing.

Section XI– Handling and Storage

Safe handling and storage advice

Cells should be handled and stored carefully to avoid short circuits.

Do not store in disorderly fashion, or allow metal objects to be mixed with stored cells.

Never disassemble a battery.

Do not breathe cell vapors or touch internal material with bare hands.

Keep cells between -20°C and 35°C for prolong storage.

When the cells are closed to fully charged, the storage temperature should be between -20°C and 30°C and should be controlled at 10-20°C during transportation and packed with efficient air ventilation.

Section XII – Exposure Controls / Personal Protection

Engineering measures:

No engineering measure is necessary during normal use. In case of internal leakage of cell materials, operate the local exhaust or enhance ventilation

Control parameters:

Common chemical name / General name	ACGIH (2002)	
	TLV-TWA	BEI
Aluminum	10mg/m ³ (metal coarse particulate) 5mg/m ³ (flammable powder) 5mg/m ³ (weld fume)	N.A.
Carbon (Artificial graphite)	2mg/m ³ (inhalant coarse particulate)	N.A.
Copper	0.2mg/m ³ (fume) 1.0mg/m ³ (a coarse particulate, mist)	N.A.
Lithium metal oxide (LiMO ₂)	0.02mg/m ³ (as cobalt)	N.A.
Lithium metal oxide (LiMO ₂)	0.2mg/m ³ (as manganese)	N.A.
Lithium metal oxide (LiMO ₂)	0.2mg/m ³ (as nickel)	N.A.
Lithium metal oxide (LiMO ₂)	5mg/m ³ (as Aluminum)	N.A.
Organic electrolyte	N.A.	N.A.

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ACGIH: American Conference of Governmental Industrial Hygienists, Inc.

TLV-TWA: Threshold Limit Value – Time Weighted Average concentration

BEI: Biological Exposure Indices

Personal protective equipment:

Respiratory protection: Respirator with air cylinder, dust mask

Hand protection: Protective gloves

Eye protection: Goggle or protective glasses designed to protect against liquid splashes

Skin and body protection: Working clothes with long sleeve and long trousers

Section XIII – Ecological InformationDo not bury or throw out into the environment as a cell and the internal materials remain in the environment.

Section XIV – Disposal MethodDispose of cells according to government regulations.

Section XV – Transportation Information

All GP lithium ion cells comply with the necessary testing requirements under the UN Manual of Tests and Criteria ST/SG/AC.10/11/Rev. 4, Section 38.3 as referenced in the following transportation regulations:

1. UN Recommendations on the Transport of Dangerous Goods Model Regulations
2. U.S. Department of Transportation Hazardous Materials Regulations (HMR),
3. International Civil Aviation Organization (ICAO) Technical Instructions,
4. International Air Transport Association (IATA) Dangerous Goods Regulations, and
5. International Maritime Dangerous Goods (IMDG) Code.

GP Cells are exempted from these regulations since they meet all UN Testing requirements and not exceed 20Wh (See 49 CFR 173.185 of the U.S. HMR, Guidance on the Transport of Lithium Batteries of 2009-2010 edition of the ICAO Technical Instructions and consequently the 51th edition of the DGR and IATA Dangerous Goods Regulations, and Special Provision 188 of the IMDG Code and UN Model Regulations.)

GP Cells contain less than 20Wh (Actual value of each model showed in page 5)

The Watt hour (Wh) Calculation:

Under the 2009-2010 edition of the ICAO Technical Instructions and consequently the 50th edition of the DGR, the unit Wh is equal to rated capacity (Ah) x nominal voltage (V)

Cells should be packaged in accordance with these transportation regulations (the cell comply to IATA Packing Instruction 965 Section II). It is especially important to ensure that cells are packed in such a way to prevent short circuits.

Non-dangerous goods.

**** The commodity is met the UN manual of Tests and Criteria, Part III, Sub-section 38.3 ****

Section XVI – Regulatory InformationSpecial requirement be according to the local regulatoryies.

Section XVII – Other Information

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

WATT-HOUR FOR LITHIUM ION BATTERY

Battery type	Model	Rated capacity (Ah)	Rated voltage (V)	Watt hour (Wh)
Cylindrical	GP1865T150	1.500	3.75	5.625
Cylindrical	GP1865T220	2.150	3.60	7.740