

Material Safety Data Sheet Lithium Primary Cells and Batteries (LM Series)

Section I – Information of Manufacturer

Manufacturer's Name: DYNAMIS Batterien GmbH
Address: Brühlstr. 15 D-78465 Dettingen / Konstanz
Tel. +49 7533 93669-0
Date 2010-09-30

Section II – Hazardous Information

Hazardous Components:

| Description: | CAS# | wt-% |
|------------------------|-----------|-------------------|
| 1. Lithium | 7439-93-2 | content see below |
| 2. Manganese dioxide | 1313-13-9 | 10-40 % |
| 3. Organic Electrolyte | | 4-20 % |

Lithium Content per Cell

| Product | Capacity in [mAh] | Content of met. Lithium in [g] |
|---------|-------------------|--------------------------------|
|---------|-------------------|--------------------------------|

Cells w/ content < 1 g per cell:

| | | |
|-------------|------|------|
| LM 14250 | 650 | 0.20 |
| LM 14250 HC | 950 | 0.28 |
| LM 14505 | 1600 | 0.53 |
| LM 17335 | 1500 | 0.50 |
| LM 17335 HC | 2000 | 0.60 |
| LM 17450 | 2300 | 0.80 |
| LM 9V-P | 1300 | 0.93 |
| LM 123A | 1500 | 0.50 |

Section III – Physical / Chemical Characteristics

Boiling Point: N/A
Vapour Pressure (mm Hg): N/A
Vapour Density (AIR=1): N/A
Solubility in Water: N/A
Appearance and Odour: Cylindrical Shape, Odourless
Specific Gravity (H2O=1): N/A
Melting Point: N/A
Evaporation Rate (Butyl Acetate): N/A

Section IV – Hazard Classification

Classification: N/A

Section V – Reactivity Data

Stability: Stable Status
Conditions to Avoid: Fire
Incompatibility (Materials to Avoid): Acids
Hazardous Decomposition of Byproducts: N/A
Hazardous Polymerization: Will not occur

Section VI – Health Hazard Data

Routes of Entry
Inhalation: N/A
Skin: N/A
Ingestion: 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 vapours may cause irritation of the upper respiratory tract and lungs.

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 vapours 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): N/A
Ignition Temp.: N/A
Flammable Limits: N/A
LEL: N/A
UEL: N/A
Extinguishing Media: Carbon Dioxide, Dry Chemical or Foam extinguishers
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 – Accidental Release or Spillage

Steps to Be Taken in Case Material is Released or Spilled:
Batteries that are leakage should be handled with rubber gloves.
Avoid direct contact with electrolyte.
Wear protective clothing and a positive pressure Self – Contained Breathing Apparatus (SCBA).

Section X – Handling and Storage

Safe handling and storage advice:

Batteries 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 batteries.

Never disassemble a battery.

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

Keep batteries between 15°C and 35°C for prolong storage.

Section XI – Exposure Controls / Person Protection

Respiratory Protection (Specify Type): N/A

Ventilation

Local Exhausts: N/A

Special: N/A

Mechanical (General): N/A

Special: N/A

Other: N/A

Eye Protection: N/A

Protective Gloves: N/A

Other Protective Clothing or Equipment: N/A

Work / Hygienic Practices: N/A

Section XII – Ecological Information

N/A

Section XIII – Disposal Method

Dispose of batteries according to government regulations.

Section XIV – Transportation Information

- a. During the transportation of a large amount of batteries by ship, trailer or railway, do not leave them in the places of high temperatures and do not allow them to be exposed to condensation.
- b. During the transportation do not allow packages to be fallen down or damaged.
- c. Lithium metal batteries identified by manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).
- d. Except when installed in equipment, for air shipment that contain one or more cells or batteries, they are necessary to meet the following items.
 1. Each consignment must be accompanied with a document such as air waybill with an indication that:
 - the package contains lithium metal cells or batteries;
 - the package must be handled with care and that a flammability hazard exists if the package is damaged;
 - special procedures should be followed in the event the package is damaged, to include inspection and repacking if necessary; and
 - a telephone number for additional information.
 2. Each package must be labeled with a lithium battery handling label.
 - The width 120mm * length 110mm sized lithium battery handling label must be labeled onto the side of a package without bending it.

3. Each package must be capable of withstanding a 1.2 m drop test in any orientation.
 - damage to cells or batteries contained therein;
 - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
 - releaser of contents.
4. Each package containing more than four cells or more than two batteries installed in equipment must be complied with above item 1 and 2.
- e. Recommendations on the transport of dangerous goods-Model Regulations 15th revised edition, IATA Special Provision A154, A164 and IMDG Special Provision 188. 2011 IATA Dangerous Goods Regulations 52nd edition Packing Instruction 968 Section is applied.

Section XV – Regulatory Information

Special requirement be according to the local regulatoryies.

Section XVI – Other Information

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

Section XVII – Measures for fire extinction

In case of fire, it is permissible to use any class of extinguishing medium on these batteries or their packing material. Cool exterior of batteries if exposed to fire to prevent rupture. Fire fighters should wear self-contained breathing apparatus.