SAFETY DATA SHEET
According to EC 1907/2006 (REACH)

Date last verification : 2015-01-30
Revision date : 2012-07-21
Publication date : 2005-06-17
Version number : 2.1

1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

SDS : 22606
Product code 12nc : 9898 031 21381
Supplier : MICRO POWER ELECTRONICS, INC.
13955 SW Millikan Way
OR 97005 Beaverton
Oregon
United States of America
TEL:+1 503-693-7600
FAX:+1 503-648-9625
Tradename : HS1/FRX LIMNO2 BATTERY (M5070A) (453564141462) : LITHIUM METAL BATTERIES [5.04 G LITHIUM]

1.2. Relevant identified uses of the substance or mixture and uses advised against

General description : BATTERY
Use : Various
Uses advised against : Data not available.

1.3. Details of the supplier of the safety data sheet

Supplier safety data sheet : Philips Electronics Nederland B.V., P.O. Box 218, 5600 MD Eindhoven, Tel. +31 (0)40 2747588
Responsible department : dangerous.goods@philips.com

1.4. Emergency telephone number

Emergency telephone number : +31 (0)497-598315

2. Hazards identification

2.1. Classification of the substance or mixture

GHS: (EC) No 1272/2008
Not classified according to GHS classification.
EC: (EC) No 67/548 or 1999/45
Not classified according to EC classification.

2.2. Label elements

GHS: (EC) No 1272/2008
GHS-Label : not applicable
Remarks on GHS-labelling : none
EC: (EC) No 67/548 or 1999/45
EC-Label : not applicable
Remarks on EC-labelling : none

2.3. Other hazards

Data not available.

Date of request : 2015-10-01
SDS 22606 - Page 1 / 8
3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-no.</th>
<th>Index No.</th>
<th>Percentage(%)</th>
<th>GHS-Label</th>
<th>EC-Label</th>
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<tbody>
<tr>
<td>LITHIUM</td>
<td>7439-93-2</td>
<td>003-001-00-4</td>
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<td>GHS02</td>
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<td>231-102-5</td>
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<td>H260 Water-react. 1</td>
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<td>H314 Skin corr. 1B</td>
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<tr>
<td>MANGANESE DIOXIDE</td>
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<td>025-001-00-3</td>
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<td>H315 Skin irrit. 2</td>
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<td>H319 Eye irrit. 2</td>
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<td>603-031-00-3</td>
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<td>H360FD Repr. 1B</td>
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<td>Repr.Cat. 2</td>
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</tr>
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</table>

For the full text of the H-sentences, hazard statements and R-sentences mentioned in this section, see section 16.

4. First aid measures

4.1. Description of first aid measures

Skin : Not applicable.
Ingestion : Not applicable.
Inhalation : Not applicable.
Eyes : Not applicable.

4.2. Most important symptoms and effects, both acute and delayed

Skin local : Not applicable.
            general : Not applicable.
Ingestion local : Not applicable.
            general : Not applicable.
Inhalation local : Not applicable.
            general : Not applicable.
Eyes local : Not applicable.

Remarks symptoms : None

4.3. Indication of any immediate medical attention and special treatment needed

None

Date of request : 2015-10-01
5. **Firefighting measures**

5.1. **Extinguishing media**
   - Suitable fire-extinguisher
determined by surrounding
   - Unsuitable fire-extinguisher
not traceable

5.2. **Special hazards arising from the substance or mixture**
   - **Hazardous decomposition products in fire**: lithium oxide, manganese oxides, carbon monoxide, hydrogen fluoride, sulphur oxides

5.3. **Advice for firefighters**
   In the event of fire, wear protective clothing and use breathing apparatus that is independent of the ambient air.

6. **Accidental release measures**

6.1. **Personal precautions, protective equipment and emergency procedures**
   - **Precautions**
     Use protective equipment. See section 8.
   - **Emergency procedure**
     Is not to be expected.

6.2. **Environmental precautions**
   Remainder material has to be incinerated in a proper installation or dumped on an approved landfill, in accordance with local and national legislation.

6.3. **Methods and material for containment and cleaning up**
   - **Spillage procedure**
     not applicable

6.4. **Reference to other sections**
   See section 8 for appropriate personal protection.
   See section 13 for additional information on waste treatment.

7. **Handling and storage**

7.1. **Precautions for safe handling**
   - Observe label precautions.
   - Do not eat, drink or smoke in work areas. Remove contaminated clothing and protective equipment. Wash hands after leaving the work area.
   - **Local exhausting**
     Under normal circumstances not applicable.
   - **Storage code (on behalf of PGS)**
     M4

7.2. **Conditions for safe storage, including any incompatibilities**
   - **Storage conditions**
     See also any precautionary statements and S-phrases in section 2.2.
     Store product protected from proximity to other sources of heat, dry.

7.3. **Specific end use(s)**
   Data not available.

8. **Exposure controls/personal protection**

8.1. **Control parameters**
   - **Exposure limits**: 
applicable to: The Netherlands (20 °C; 1013 mbar)
No TWA has been laid down.
TWA(8 hours): 1 mg/m³ LITHIUM
TWA(15 minutes): 3 mg/m³ MANGANESE DIOXIDE (as manganese)
No TWA has been laid down.
No TWA has been laid down.
No TWA has been laid down.
TWA(8 hours): 0.5 mg/m³ MANGANESE DIOXIDE (as manganese, inhalable dust)

applicable to: Belgium (20 °C; 1013 mbar)
TWA(8 hours): 0.2 mg/m³ MANGANESE DIOXIDE (as manganese)

applicable to: Germany (20 °C; 1013 mbar)
TWA(8 hours): 0.5 mg/m³ MANGANESE DIOXIDE (as manganese, inhalable dust)

applicable to: United States of America (25 °C; 1013 mbar)
TWA(8 hours): 0.02 mg/m³ MANGANESE DIOXIDE (as manganese, respirable dust) - [according to ACGIH]
TWA(8 hours): 0.1 mg/m³ MANGANESE DIOXIDE (as manganese, inhalable dust) - [according to ACGIH]
TWA(8 hours): 5 mg/m³ C MANGANESE DIOXIDE (as manganese) - [according to OSHA]

applicable to: Sweden (20 °C; 1013 mbar)
TWA(8 hours): 0.02 mg/m³ C LITHIUM (as inhalable dust)
TWA(8 hours): 0.2 mg/m³ MANGANESE DIOXIDE (as manganese, dust)
TWA(8 hours): 0.1 mg/m³ MANGANESE DIOXIDE (as manganese, respirable dust)
TWA(8 hours): 0.02 mg/m³ C LITHIUM TRIFLUOROMETHANESULPHONATE (as lithium, inhalable dust)

applicable to: Switzerland (20 °C; 1013 mbar)
TWA(8 hours): 0.5 mg/m³ MANGANESE DIOXIDE (as manganese, inhalable dust)

applicable to: China (20 °C; 1013 mbar)
TWA(8 hours): 0.15 mg/m³ MANGANESE DIOXIDE

C=Ceiling; S=Skin

Remarks exposure limits:
none

DNEL (Derived No Effect Level)
Data not available.

PNEC (Predicted No Effect Concentration)
Data not available.

8.2. Exposure controls

Advised personal protection:
Hands: not applicable
Breakthrough time: not applicable
Eyes: not applicable
Inhalation: not applicable
Skin: none (when used normally)

9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state: battery
Colour: type dependent
Odour: odourless
Odour threshold (20°C; 1013 mbar): not traceable
pH: not applicable
Melting point/range: not traceable
Boiling point/range: not traceable
Flash point/range: not applicable
Vapor rate/range: not applicable
Flammability (solid, gas): data not available
Explosive limits: not applicable
Vapour pressure: not applicable
Density: not traceable
Solubility in water: not applicable
Log Pow: <0 MANGANESE DIOXIDE
Source: IUCLID

-0.49 LITHIUM TRIFLUOROMETHANESULPHONATE
Source: Easi View

-0.48 PROPYLENE CARBONATE
Source: IUCLID
9.2. Other information

Solubility in fat : not applicable
Electrostatic chargement : not traceable

10. Stability and reactivity

10.1. Reactivity

See section 10.2 - 10.6.

10.2. Chemical stability

The substance or mixture is stable under normal conditions. See also section 10.4.

10.3. Possibility of hazardous reactions

Reactions with water : no
Other hazardous conditions : Data not available.

10.4. Conditions to avoid

Data not available.

10.5. Incompatible materials

Hazardous reactions with : none

10.6. Hazardous decomposition products

Hazardous decomposition products at heating : none

11. Toxicological information

11.1. Information on toxicological effects

Acute oral toxicity
LD-50: >3.478 g/kg (ORL-RAT) MANGANESE DIOXIDE Source : ChemDat (Merck)
LD-50: 29 g/kg (ORL-RAT) PROPYLENE CARBONATE Source : IUCLID
LD-50: 5.37 mg/kg (ORL-RAT) DIMETHOXYETHANE, 1,2- Source : ChemDat (Merck)
LD-50: 3.2 g/kg (ORL-MUS) DIMETHOXYETHANE, 1,2- Source : Sigma-Aldrich

Acute dermal toxicity
LD-50: >5 g/kg (SKN-RAT) DIMETHOXYETHANE, 1,2- Source : ChemDat (Merck)

Acute inhalation toxicity
There are no data available.

Ames test
negative PROPYLENE CARBONATE Source : IUCLID
negative DIMETHOXYETHANE, 1,2- Source : ChemDat (Merck)

Skin corrosion/irritation
The substance or mixture is not classified for skin corrosion/irritation.

Serious eye damage/irritation
The substance or mixture is not classified for serious eye damage/irritation.

Respiratory or skin sensitisation
The substance or mixture is not classified for respiratory or skin sensitisation.

Germ cell mutagenicity
The substance or mixture is not classified for germ cell mutagenicity.

Carcinogenicity
The substance or mixture is not classified for carcinogenicity.
Reproductive toxicity
The substance or mixture is not classified for reproductive toxicity.

Specific target organ toxicity-single exposure
The substance or mixture is not classified for specific target organ toxicity-single exposure.

Specific target organ toxicity-repeated exposure
The substance or mixture is not classified for specific target organ toxicity-repeated exposure.

Aspiration hazard
The substance or mixture is not classified for aspiration hazard.

Symptoms

<table>
<thead>
<tr>
<th></th>
<th>Skin</th>
<th>Ingestion</th>
<th>Inhalation</th>
<th>Eyes</th>
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</thead>
<tbody>
<tr>
<td>local</td>
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<tr>
<td>general</td>
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Remarks symptoms : None

12. **Ecological information**

12.1. **Toxicity**

**Ecotoxicity**

<table>
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<tr>
<th>Parameter</th>
<th>Value</th>
<th>Source</th>
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<tbody>
<tr>
<td>LC-50: 5300 mg/l/96H (Fish)</td>
<td>PROPYLENE CARBONATE</td>
<td>IUCLID</td>
</tr>
<tr>
<td>EC-50: &gt;500 mg/l/48H (Daphnia)</td>
<td>PROPYLENE CARBONATE</td>
<td>IUCLID</td>
</tr>
<tr>
<td>IC-50: &gt;500 mg/l/72H (Algae)</td>
<td>PROPYLENE CARBONATE</td>
<td>IUCLID</td>
</tr>
<tr>
<td>LC-50: &gt;500 mg/l/96H (Fish)</td>
<td>DIMETHOXYETHANE, 1,2-</td>
<td>ACROS</td>
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</table>

12.2. **Persistence and degradability**

<table>
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<th>Value</th>
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<td>Biological oxygen demand (5)</td>
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<tr>
<td>Chemical oxygen demand</td>
<td>1.29 g/g</td>
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<tr>
<td>Biological(5)/chemical oxygen demand ratio</td>
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<tr>
<td>Degradability</td>
<td>not MANGANESE DIOXIDE</td>
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12.3. **Bioaccumulative potential**

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<td>-0.21</td>
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12.4. **Mobility in soil**

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<td>Henry Constant</td>
<td>9.92E-8 atm m3/mol</td>
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</tr>
<tr>
<td></td>
<td>3.63E-4 atm m3/mol</td>
<td>Easiview</td>
</tr>
</tbody>
</table>

12.5. **Results of PBT and vPvB assessment**

Data not available.

12.6. **Other adverse effects**

Remarks on ecotoxicity : none

13. **Disposal considerations**

13.1. **Waste treatment methods**

Remainder material has to be incinerated in a proper installation or dumped on an approved landfill, in accordance with local and national legislation.
14. Transport information

14.1. UN number

ADR/RID : 3090
IMDG/IMO : 3090
IATA/ICAO : 3090

Remarks IATA/ICAO : The product must be transported in accordance with the regulations of IATA PACKING INSTRUCTION 968 - SECTION IA (Meets the GENERAL REQUIREMENTS of IATA PACKING INSTRUCTION 968). The batteries meet the requirements of each test of the "UN Manual of Tests and Criteria, Part III, subsection 38.3".

14.2. UN proper shipping name

ADR/RID : LITHIUM METAL BATTERIES
IMDG/IMO : LITHIUM METAL BATTERIES
IATA/ICAO : LITHIUM METAL BATTERIES

14.3. Transport hazard class(es)

ADR/RID : 9
IMDG/IMO : 9
IATA/ICAO : 9

14.4. Packing group

ADR/RID : none
IMDG/IMO : none
IATA/ICAO : none

14.5. Environmental hazards

Marine pollutant : no

14.6. Special precautions for user

Hazard identification number (ADR/RID) : none
EmS (IMDG/IMO) : F-A, S-I

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Data not available.

15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

- Data not available.

15.2. Chemical safety assessment

- Data not available.

16. Other information

Remarks on SDS : The presence of lithium-batteries gives an enlarged risk of fire.

Overview relevant H-sentences from all components in section 3

H225 Highly flammable liquid and vapour.
H260 In contact with water releases flammable gases which may ignite spontaneously.
H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H335 May cause respiratory irritation.
H360FD May damage fertility. May damage the unborn child.
H361fd Suspected of damaging fertility. Suspected of damaging the unborn child.
EUH014 Reacts violently with water.
EUH019 May form explosive peroxides.

Overview relevant hazard statements from all components in section 3
C CORROSIVE
F HIGHLY FLAMMABLE
T TOXIC
Xi IRRITANT
Xn HARMFUL

Overview relevant R-sentences from all components in section 3
11 Highly flammable.
14/15 Reacts violently with water, liberating extremely flammable gases.
19 May form explosive peroxides.
20 Harmful by inhalation.
20/22 Harmful by inhalation and if swallowed.
34 Causes burns.
36 Irritating to eyes.
36/37/38 Irritating to eyes, respiratory system and skin.
60 May impair fertility.
61 May cause harm to the unborn child.
62 Possible risk of impaired fertility.
63 Possible risk of harm to the unborn child.

Training advice
Provide adequate information, instruction and training for operators.

A key or legend to abbreviations and acronyms used in the safety data sheet
REACH Registration, Evaluation and Authorisation of Chemicals
GHS Globally Harmonised System of Classification and Labelling of Chemicals
CAS Chemical Abstracts Service
TWA Time Weighted Average
LEL Lower Explosive Limit
UEL Upper Explosive Limit
ADR Accord européen relatif au transport international des marchandises Dangereuses par Route
RID Règlement concernant le transport international ferroviaire des marchandises dangereuses
UN United Nations
IMDG International Maritime Dangerous Goods
IMO International Maritime Organization
IATA International Air Transport Association
ICAO International Civil Aviation Organization
EmS Emergency Schedule

* Point to alterations with regard to the previous version.
The information provided in this Material Safety Data Sheet is correct to the best of the knowledge, information and belief of Philips Electronics Nederland B.V. at the date of its printing.