

**Safety Data Sheet**  
**According to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and GHS**

Revision: 16.07.2018

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

- **Product Identifier**
- **Trade name:** Battery Pack P/N 452-0133 & 452-0222
- **Article number:** 452-0133 & 452-0222
- **1.2 Relevant identified uses of the substance or mixture and uses advised against**  
No further relevant information available.
- **Application of the substance / the preparation** Lithium Metal based battery product
- **1.3 Details of the supplier of the Safety Data Sheet**
- **Manufacturer/Supplier:**  
ACR Electronics, Inc.  
5757 Ravenswood Rd., Ft. Lauderdale, FL. 33312 USA  
PHONE: (954)-981-3333  
FAX: (954)-961-4403  
WEBSITE: [www.acrartex.com](http://www.acrartex.com)  
E-MAIL: [msds@acrartex.com](mailto:msds@acrartex.com)
- **1.4 Emergency telephone number:**  
ChemTel Inc.  
(800)255-3924, +1 (813)248-0585



**2 Hazards identification**

- **2.1 Classification of the substance or mixture**
- **Classification according to Regulation (EC) No 1272/2008**



GHS08 health hazard

Repr. 1B                      H360FD may damage fertility. May damage the unborn child.

.....



GHS05 corrosion

Eye Dam. 1                      H318 Causes serious eye damage

.....



GHS07

Acute Tox. 4   H302      Harmful if swallowed.  
Acute Tox. 4   H332      Harmful if inhaled.  
Skin Irrit. 2    H315      Causes skin irritation.

.....

- **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**



C; Corrosive

R35: Causes severe burns

.....



Xn; Harmful

R20: Harmful by inhalation.

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- **Hazard description:** Information references exposures to battery contents, and not exposures to whole units. Exposures to whole units are unlikely to product health hazards. Note: The hazards listed in this document reference only the contents of cells and/or batteries that are leaking and/or ruptured. Undamaged cells and/or batteries possess no expected health or physical hazards during normal use. Intentional abuse of cells or batteries increases the risk of harm or damage to the product, to the user, and to surrounding materials and personnel. Do not attempt to open sealed cells or batteries. Do not intentionally short-circuit cells or batteries. Do not expose these products to temperatures exceeding the maximum manufacturers rating. Do not dispose of cells/batteries in landfills. Please follow all manufacturer guidelines in the use, storage, and disposal of these products. Consult manufacturer in cases of questions involving specific product usage. Do not short circuit, recharge, puncture, incinerate, crush, force discharge or expose to temperatures above the specified range. Upon severe mechanical, electrical or thermal abuse, the cell may vent with the expulsion of some of the content.
- **Information concerning particular hazards for human and environment:**  
The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
- **Classification system:**  
The classification is according to the latest editions of the EU-lists, and extended by company and literature data. The classification is in accordance with the latest editions of international substances lists, and is supplemented by information from technical literature and by information provided by the company.

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## 2.2 Label elements

### Labeling according to Regulation (EC) No 1272/2008

The product is classified and labelled according to the CLP regulation.

### Hazard pictograms



GHS05 GHS07 GHS08

- **Signal word:** Danger
- **Hazard-determining components of labeling:**  
Manganese dioxide 1,2- dimethoxyethane lithium
- **Hazard statements:**  
H302+H332 Harmful if swallowed or if inhaled.  
H315 Causes skin irritation.  
H318 Causes serious eye damage.  
H360FD May damage fertility. May damage the unborn child.  
EUH014 Reacts violently with water.

Safety data sheet available on request.

To avoid risks to human health and the environment, comply with the instructions for use.

38 percent of the mixture consists of component(s) of unknown toxicity

### Precautionary statements:

- P281 Use personal protective equipment as required.
- P261 Avoid breathing dust.

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- P303 +P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- P312 Call a POISON CENTER or doctor/physician if you feel unwell.

• **Additional information:**

Information references exposures to battery contents, and not exposures to whole units.  
Exposures to whole units are unlikely to product health hazards.

• **Hazard description:**

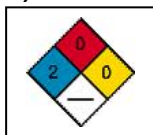
• **WHMIS-symbols:**

- D1B - Toxic material causing immediate and serious toxic effects
- D2B - Toxic material causing other toxic effects
- E - Corrosive material



• **NFPA ratings (scale 0 – 4)**

Health = 2  
Fire = 0  
Reactivity = 0



• **HMIS—ratings (scale 0 – 4)**

Health - \*2  
Fire = 0  
Reactivity = 0

HEALTH	*2
FIRE	0
REACTIVITY	0

• **HMIS Long Term Health Hazard Substances**

110-71-4	1,2 - dimethoxyethane
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• **2.3 Other hazards**

• **Results of PBT and vPvB assessment**

- **PBT:** Not applicable.
- **vPvB:** Not applicable.

## 3 Composition/information on ingredients

• **3.1 Mixtures**

- **Description:** Mixture of substances listed below with nonhazardous additions

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· <b>Dangerous Components:</b>		
CAS: 1313-13-9 EINECS: 215-202-6 Index number: 025-001-00-3	manganese dioxide  Xi R20/22 <hr/>  Acute Tox. 4, H302; Acute Tox. 4, H332	25-50%
CAS: 108-32-7 EINECS: 203-572-1 Index number: 607-194-00-1	propylene carbonate  Xi R36 <hr/>  Eye Irrit. 2, H319	<10%
CAS: 110-71-4 EINECS: 203-794-9 Index number: 603-031-00-3	1,2-dimethoxyethane  T Repr. Cat. 2 R60-61;  Xn R20;  F R11 R19 <hr/>  Flam. Liq. 2, H225  Repr.n 1B, H360FD  Acute Tox. 4, H332	<10%
CAS: 109-99-9 EINECS: 203-726-8 Index number: 603-025-00-0	Tetrahydrofuran  Xi R36/37;  F R11 R19 <hr/>  Flam. Liq. 2, H225  Eye Irrit. 2, H319; STOT SE 3, H335	<10%
CAS: 7439-93-2 EINECS: 231-102-5 Index number: 003-001-00-4	Lithium  C R34;  F R14/15 <hr/>  Water-react. 1, H260  Skin corr. 1B, H314	<10%
CAS: 1333-86-4 EINECS: 215-609-9	Carbon black Substance with a community workplace exposure limit.	<10%
CAS: 7791-03-9 EINECS: 232-237-2	lithium perchlorate  Xn R22;  Xi R36/37/38;  O R9 <hr/>  Ox. Sol. 1, H271  Acute Tox. 4, H302; Skin Irrit. 2, H315; Eye Irrit. 2, H319; STOT SE 3, H335	<10%

· **Additional information:** For the wording of the listed risk phrases refer to section 16.

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## 4 First aid measures

### • 4.1 Description of first aid measures

#### • General information:

The hazards listed below reference only the contents of cells and/or batteries that are leaking and/or ruptured, with the exception of ingestions. In the unlikely case where intact cells/batteries are ingested and then release contents, the treatment is the same as for ingestions of device contents. Seek immediate medical advice.

#### • After inhalation:

Unlikely route of exposure.

Supply fresh air.

Seek immediate medical advice.

In case of unconsciousness, place patient stably in side position for transportation

#### • After skin contact:

Immediately rinse with water.

Do not pull solidified product off the skin.

Seek immediate medical advice.

#### • After eye contact:

Unlikely route of exposure.

Protect unharmed eye.

Rinse opened eye for several minutes under running water.

Remove contact lenses if worn, if possible.

Rinse opened eye for several minutes under running water. Then consult a doctor.

#### • After swallowing:

Rinse out mouth and then drink plenty of water.

Do not induce vomiting; call for medical help immediately.

### • 4.2 Most important symptoms and effects, both acute and delayed

Gastric or intestinal disorders

Breathing difficulty

Coughing

Nausea

Profuse sweating

#### • Hazards:

Danger of gastric perforation.

Danger of pulmonary oedema.

### • 4.3 indication of any immediate medical attention and special treatment needed

Note to Physician: Published reports recommend removal from the esophagus be done endoscopically (under direct visualization). Batteries beyond the esophagus need not be retrieved unless there are signs of injury to the GI tract or a large diameter battery fails to pass the pylorus. If asymptomatic, follow-up x-rays are necessary only to confirm the passage of larger batteries. Confirmation by stool inspection is preferable under most circumstances. For information on treatment, telephone (202) 625-3333 collect, day or night. Various corrosive, harmful or toxic substances is possible in certain cases. These substances may include lithium and/or fluoride salts; specific antidotes may be required in cases of ingestion for lithium salts and in cases of oral/dermal/inhalation contact with fluorides. If fluoride contact is suspected, calcium salts may be of value in treatment. Do not give ipecac.

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## 5 Firefighting measures

- **5.1 Extinguishing media**
- **Suitable extinguishing agents:**
  - Water in flooding quantities.
  - Sand
  - Dry sand
  - Limestone powder
  - Cement
- **For safety reasons unsuitable extinguishing agents:**
  - Water haze
  - Carbon dioxide
- **5.2 Special hazards arising from the substance or mixture**
  - Formation of toxic gases is possible during heating or in case of fire.
- **5.3 Advice for firefighters**
- **Protective equipment:**
  - Wear self-contained respiratory protective device.
  - Wear fully protective suit.
- **Additional information:**
  - Cool endangered receptacles with water spray.

## 6 Accidental release measures

- **6.1 Personal precautions, protective equipment and emergency procedures:**
  - Use respiratory protective device against the effects of fumes/dust/aerosol.
  - Wear protective equipment. Keep unprotected persons away.
  - Product forms slippery surface when combined with water.
  - Ensure adequate ventilation.
- **6.2 Environment precautions:**
  - Do not allow to enter sewers/ surface or ground water.
- **6.3 Methods and material for containment and cleaning up:**
  - Pick up mechanically.
  - For small content spills, ventilate area and put on gloves and safety glasses. Large spills require special equipment and training to include the use of a respirator. For large spills involving many batteries, contact authorities. Ventilation recommended for spilled contents. Avoid release to the environment. If a spill is small, attempt to contain the leak by carefully transferring leaking battery to plastic bag. Add sodium bicarbonate (baking soda) powder to bag, seal, then place bag inside a second bag. Seal second bag and label appropriately; **DO NOT DISCARD INTO HOUSEHOLD TRASH**. Carefully neutralize remainder by applying sodium bicarbonate solution **SLOWLY**, and then allow to cool. Wipe up, then place in a **SEPARATE** container from the battery as the water will react with the battery contents.

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- **6.4 Reference to other sections**

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

## 7 Handling and storage

- **7.1 Precautions for safe handling**

Keep away from open flames or temperatures exceeding manufacturer ratings. DO NOT ATTEMPT TO OPEN SEALED CELLS OR BATTERIES – BATTERY CONTENTS MAY PRESENT SERIOUS SAFETY AND HEALTH HAZARDS. SHORT-CIRCUITING THE TERMINALS OF A DEVICE MAY RESULT IN DAMAGE TO DEVICE AND ANY NEARBY OBJECTS OR PERSONNEL.

All ACR/ARTEX batteries and battery packs were tested and meets requirements for shipping per The UN Manual of Tests and Criteria, Part III, Subsection 38.3, UN T1-T8 Tests ST/SG/AC.10/11.

- **Information about fire – and explosion protection:**

Emergency cooling must be available in case of nearby fire.

Keep ignition sources away - Do not smoke.

- **7.2 Conditions for safe storage, including any incompatibilities**

- **Storage:**

- **Requirements to be met by storerooms and receptacles:**

Store in a dry, well-ventilated place. Do not use or store near open flame.

Avoid extreme temperatures; battery may rupture and release contents. Do not store and transport with incompatible materials. Store individual batteries or cells only in approved packaging in order to avoid inadvertent short circuits, as this may result in damage to device, nearby objects, personnel, or all of the above.

- **Information about storage in one common storage facility:**

Store away from water.

Do not store together with acids.

Do not store together with alkalis (caustic solutions).

- **Further information about storage conditions:** None

- **7.3 Specific end use(s):** No further relevant information available.

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## 8 Exposure controls/personal protection

- Additional information about design of technical facilities: No further data; see item 7
- 8.1 Control parameters

### Ingredients with limit values that require monitoring at the workplace:

#### 1313-13-9 manganese dioxide

PEL (USA)	Short-term value: C 5 mg/m <sup>3</sup> as Mn
REL (USA)	
TLV (USA)	Short-term value: 3 mg/m <sup>3</sup>
EL (Canada)	Long-term value: 1 mg/m <sup>3</sup> as Mn
	0,2 mg/m <sup>3</sup> as Mn
	0,2 mg/m <sup>3</sup> as Mn; R

#### 109-99-9 tetrahydrofuran

IOELV (EU)	Short-term value: 300 mg/m <sup>3</sup> , 100 ppm
	Long-term value: 150 mg/m <sup>3</sup> , 50 ppm
	Skin
PEL (USA)	590 mg/m <sup>3</sup> , 200 ppm
REL (USA)	Short-term value: 735 mg/m <sup>3</sup> , 250 ppm
	Long-term value: 590 mg/m <sup>3</sup> , 200 ppm
TLV (USA)	Short-term value: 295 mg/m <sup>3</sup> , 100 ppm
	Long-term value: 147 mg/m <sup>3</sup> , 50 ppm
	Skin
EL (Canada)	Short-term value: 100 ppm
	Long-term value: 50 ppm
	Skin
EV (Canada)	Short-term value: 100 ppm
	Long-term value: 50 ppm
	Skin

#### 110-71-4 1,2-dimethoxyethane

EV (Canada)	18 mg/m <sup>3</sup> , 5 ppm
	Skin

#### 1333-86-4 Carbon black

PEL (USA)	3,5 mg/m <sup>3</sup>
REL (USA)	3,5* mg/m <sup>3</sup>
	*0,1 in presence of PAHs, as PAHs; 10-hr TWA
TLV (USA)	3* mg/m <sup>3</sup>
	*inhalable fraction
EL (Canada)	3 mg/m <sup>3</sup>
	IARC 2B
EV (Canada)	3,5 mg/m <sup>3</sup>




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- **DNELs:** No further relevant information available.
- **PNECs:** No further relevant information available.
- **Additional information:** The lists valid during the making were used as basis.
  
- **8.2 Exposure controls**
- **Personal protective equipment:**
- **General protective and hygienic measures:**
  - Keep away from foodstuffs, beverages and feed.
  - Immediately remove all soiled and contaminated clothing
  - Wash hands before breaks and at the end of work.
  - Avoid contact with the eyes and skin.
- **Respiratory protection:**
  - Not required under normal conditions of use.
  - For spills, respiratory protection may be advisable.
- **Protection of hands:** Strong material gloves
- **Material of gloves:** Strong material gloves
- **For the permanent contact gloves made of the following materials are suitable:**
  - Strong material gloves
- **Eye protection:**
  -  Safety glasses
- **Body protection:** Not required under normal conditions of use.
- **Limitation and supervision of exposure into the environment:**
  - No further relevant information available.
- **Risk management measures:**
  - See Section 7 for additional information.
  - No further relevant information available.

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## 9 Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

#### General Information

#### Appearance:

- Form: Impermeable container containing liquid and solid contents plus inert carrier materials.
- Colour: According to product specification Dark grey
- Odour: Normally odourless. Leaking devices may emit acid or ethereal odours.
- Odour threshold: Not determined.

• pH-value: Not applicable

#### Change in condition

- Melting point/Melting range: Undetermined
- Boiling point/Boiling range: Undetermined

• Flash point: Not applicable

• Flammability (solid, gaseous): Statement refers to device contents only. Contact with water liberates extremely flammable gases.

• Ignition temperature: Not determined

• Decomposition temperature: Not determined

• Self-igniting: Product is not self-igniting

• Danger of explosion: Product does not represent an explosion hazard during normal use. Leaking contents may react with water to produce explosive or flammable gas.

#### Explosion limits:

- Lower: Not determined
- Upper: Not determined

• Vapour pressure: Not applicable

• Density: Not determined

• Relative density: Not determined

• Vapour density: Not determined

• Evaporation rate: Not determined

• Solubility in / Miscibility with water: Insoluble

• Partition coefficient (n-octanol/water): Not determined

#### Viscosity:

- Dynamic: Not applicable
- Kinematic: Not applicable

• Solvent content:  
Organic solvents: Not determined

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- |                                 |   |
|---------------------------------|---|
| • <b>Solids Content:</b>        | Not determined                            |
| • <b>9.2 Other information:</b> | No further relevant information available |

## 10 Stability and reactivity

- **10.1 Reactivity**
- **10.2 Chemical stability**
- **Thermal decomposition / conditions to be avoided:**  
No decomposition if used and stored according to specifications. To avoid thermal decomposition do not overheat.
- **10.3 Possibility of hazardous reactions:**  
Hazardous reactions generally occur with contents of leaking batteries only. Contact with water releases flammable gases.  
Violent reaction with air and oxidizing agents. Immediate ignition on contact with air.  
Strong exothermic reaction with acids.  
May produce violent reactions with bases and numerous organic substances including alcohols and amines.
- **10.4 Conditions to avoid:**  
Store away from oxidizing agents.
- **10.5 Incompatible materials:**  
Contact with acids liberates toxic gases.
- **10.6 Hazardous decomposition products:**  
Toxic metal compounds  
Poisonous gases/vapours  
Carbon monoxide and carbon dioxide  
Hydrogen chloride (HCl)  
Hydrogen

## 11 Toxicological information

- **11.1 Information on toxicological effects**
- **Acute toxicity:**
- **Primary irritant effect:**
- **On the skin:** Caustic effect on skin and mucous membranes
- **On the eye:** Strong caustic effect
- **Sensitization:** No sensitizing effects known.
- **Additional toxicological information:** Information references exposures to battery contents, and not exposures to whole units. Exposures to whole units are unlikely to product health hazards. When used and handled according to specifications, the product does not have any harmful effects to our experience and the information provided to us. Corrosive, Irritant, Harmful.

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## 12 Ecological information

- **12.1 Toxicity**
- **Aquatic toxicity:**

The product contains materials that are harmful to the environment.
- **12.2 Persistence and degradability**

The product is partly biodegradable. Significant residuals remain. A part of the components are biodegradable
- **12.3 Bioaccumulative potential:**

Does not accumulate in organisms
- **12.4 Mobility in soil:**

No further relevant information available.
- **Additional ecological information:**
- **General notes:**

The product contains materials that are harmful to the environment.  
This statement was deduced from products with a similar structure or composition.  
Avoid transfer into the environment.  
Water hazard class 2 (German Regulation) (Self-assessment): hazardous for water  
Do not allow product to reach ground water, water course or sewage system.
- **12.5 Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **12.6 Other adverse effects:**

No further relevant information available.

## 13 Disposal considerations

- **13.1 Waste treatment methods**
- **Recommendation**

Must not be disposed together with household garbage. Do not allow product to reach sewage system. Contact waste processors for recycling information.
- **Uncleaned packaging:**
- **Recommendation:**

Disposal must be made according to official regulations.



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## 14 Transport information

<ul style="list-style-type: none"> <li>• <b>14.1 UN-Number</b></li> <li>• <b>DOT, ADR, IMDG, IATA</b></li> </ul>	<p style="text-align: right;">UN3090</p>
<ul style="list-style-type: none"> <li>• <b>14.2 UN proper shipping name</b></li> <li>• <b>DOT, IMDG, IATA</b></li> <li>• <b>ADR</b></li> </ul>	<p style="text-align: right;">LITHIUM METAL BATTERIES 3090 LITHIUM METAL BATTERIES</p>
<ul style="list-style-type: none"> <li>• <b>14.3 Transport hazard class(es)</b></li> <li>• <b>DOT, IMDG, IATA</b></li> </ul> <div style="text-align: center; margin: 10px 0;">  </div> <ul style="list-style-type: none"> <li>• <b>Class:</b> 9 Miscellaneous dangerous substances and articles.</li> <li>• <b>Label:</b> 9</li> </ul>	
<ul style="list-style-type: none"> <li>• <b>ADR</b></li> </ul> <div style="text-align: center; margin: 10px 0;">  </div> <ul style="list-style-type: none"> <li>• <b>Class:</b> 9 (M4) Miscellaneous dangerous substances and articles.</li> <li>• <b>Label:</b> 9</li> </ul>	
<ul style="list-style-type: none"> <li>• <b>14.4 Packing group</b></li> <li>• <b>DOT, ADR, IMDG, IATA</b></li> </ul>	
<ul style="list-style-type: none"> <li>• <b>14.5 Environmental hazards:</b></li> <li>• <b>Marine pollutant:</b></li> </ul>	<p style="text-align: right;">No</p>
<ul style="list-style-type: none"> <li>• <b>4.6 Special precautions for user:</b></li> <li>• <b>Danger code (Kemler):</b></li> <li>• <b>EMS Number:</b></li> </ul>	<p style="text-align: right;">Warning: Miscellaneous dangerous substance and articles. 90 F-A,S-I</p>
<ul style="list-style-type: none"> <li>• <b>14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC CODE:</b></li> </ul>	<p style="text-align: right;">Not applicable.</p>
<ul style="list-style-type: none"> <li>• <b>Transport/Additional information:</b></li> <li>• <b>ADR</b></li> <li>• <b>Limited quantities (LQ)</b></li> </ul>	<p style="text-align: right;">0</p>
<ul style="list-style-type: none"> <li>• <b>UN "Model Regulation":</b></li> <li>•</li> </ul>	<p style="text-align: right;">UN3090, LITHIUM METAL BATTERIES, 9 PI968 IA</p>

Li/Batt	Total Wh	Battery weight
13.32g	133.2	25.24oz

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## 15 Regulatory information

- **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
- **United States (USA)**
- **SARA**

- **Section 355 (Extremely hazardous substances):**

None of the ingredients is listed.

- **Section 313 (Specific toxic chemical listings):**

None of the ingredients are listed.

- **TSCA (Toxic Substances Control Act):**

All ingredients are listed.

- **Proposition 65 (California):**

- **Chemicals known to cause cancer:**

References to chemical components listed below are based on unbound respirable particles and are not generally applicable to product as supplied.

1333-86-4	Carbon black
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- **Chemicals known to cause reproductive toxicity for females:**

None of the ingredients is listed

- **Chemicals known to cause reproductive toxicity for males:**

None of the ingredients is listed.

- **Chemicals known to cause developmental toxicity:**

None of the ingredients is listed.

- **Carcinogenic Categories**

- **EPA ( Environmental Protection Agency)**

1313-13-9	Manganese dioxide	D
7791-03-9	Lithium perchlorate	NL

- **IARC (International Agency for Research on Cancer)**

109-99-9	Tetrahydrofuran	A3
1333-86-4	Carbon black	A4

- **TLV (Threshold Limit Value established by ACGIH)**

None of the ingredients is listed.

- **NIOSH-Ca (National Institute for Occupational Safety and Health)**

1333-86-4	Carbon black
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- **OSHA-Ca (Occupational Safety & Health Administration)**

None of the ingredients is listed.

- **Canada**

- **Canadian Domestic Substances Lisa (DSL)**

All ingredients are listed.

- **Canadian Ingredient Disclosure list (limit 0.1%)**

None of the ingredients is listed.

- **Canadian Ingredient Disclosure list (limit 1%)**

108-32-7	Propylene carbonate
109-99-9	Tetrahydrofuran
1333-86-4	Carbon black

- **15.2 Chemical safety assessment:** A chemical Safety Assessment has not been carried out.

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## 16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

### • Relevant phrases

H225	Highly flammable liquid and vapour.
H260	In contact with water releases flammable gases which may ignite spontaneously.
H271	May cause fire or explosion; strong oxidiser.
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.
R11	Highly flammable.
R14/15	Reacts violently with water, liberating extremely flammable gases.
R19	May form explosive peroxides.
R20	Harmful by inhalation.
R20/22	Harmful by inhalation and if swallowed.
R22	Harmful if swallowed.
R34	Causes burns.
R36	Irritating to eyes.
R36/37	Irritating to eyes and respiratory system.
R36/37/38	Irritating to eyes, respiratory system and skin.
R60	May impair fertility.
R61	May cause harm to the unborn child.
R9	Explosive when mixed with combustible material.

### • Abbreviations and acronyms:

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods DOT: US Department of Transportation

IATA: International Air Transport Association

GHS: Globally Harmonized System of Classification and Labelling of Chemicals ACGIH: American Conference of Governmental Industrial Hygienists

NFPA: National Fire Protection Association (USA) HMIS: Hazardous Materials Identification System (USA)

WHMIS: Workplace Hazardous Materials Information System (Canada) DNEL: Derived No-Effect Level (REACH)

PNEC: Predicted No-Effect Concentration (REACH)

### • Sources

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