



Be Right™

# SAFETY DATA SHEET

Issue Date 19-Sep-2018

Revision Date 19-Sep-2018

Version 1.2

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## 1. IDENTIFICATION

**Product identifier**

**Product Name** MSDS Battery, CR1220, Lithium Perchlorate

**Other means of identification**

**Product Code(s)** CR1220MC

**Safety data sheet number** M02735

**UN/ID no** UN3090

**Recommended use of the chemical and restrictions on use**

**Recommended Use** Battery / Internal Battery Back-up.

**Uses advised against** None.

**Restrictions on use** None.

**Details of the supplier of the safety data sheet**

**Manufacturer Address**

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

**Emergency telephone number**

+1(303) 623-5716 - 24 Hour Service +1(515)232-2533 - 8am - 4pm CST

## 2. HAZARDS IDENTIFICATION

**Classification**

**Regulatory Status**

Safety Data Sheets are a sub-requirement of the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, 29 CFR Subpart 1910.1200. This Hazard Communication Standard does not apply to various subcategories including anything defined by OSHA as an "article".

According to OSHA, Article means a manufactured item other than a fluid or particle: (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g., minute or trace amounts of a hazardous chemical (as determined under paragraph (d) of this section), and does not pose a physical hazard or health risk to employees.

Because all of our batteries are defined as "articles", they are exempted from the requirements of the Hazard Communication Standard.

The battery is hermetically sealed. Thus, the ingredients have no hazard potential, except the battery is violated or dismantled. In case of mistreatment the ingredients are released, a spontaneously flammable gas mixture may be released under certain circumstances (measures according to chapter 4 to 6).

Attention: If batteries are treated wrong the danger of burns or bursts occurs. Batteries must not be heated above 100°C or incinerated. The battery contents must not get in contact with water. If the negative electrode gets in contact with water or humidity hydrogen gas is formed, which may inflame spontaneously.

Substances or mixtures which, in contact with water, emit flammable gases	Category 1
Acute toxicity - Oral	Category 4
Acute toxicity - Inhalation (Vapors)	Category 4

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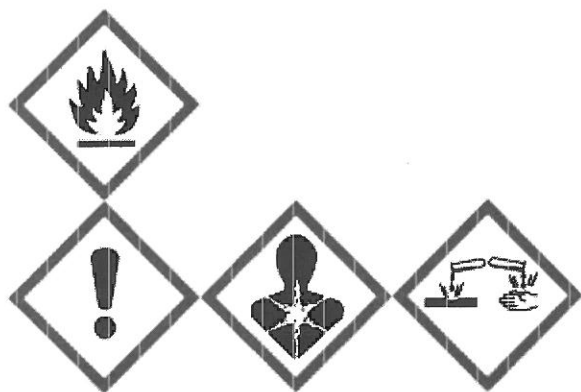
Acute toxicity - Inhalation (Dusts/Mists)	Category 4
Skin corrosion/irritation	Category 1 Sub-category B
Serious eye damage/eye irritation	Category 1
Reproductive toxicity	Category 1B
Effects on or via lactation	Yes
Specific target organ toxicity (single exposure)	Category 3
Specific target organ toxicity (repeated exposure)	Category 1

**Hazards not otherwise classified (HNOC)**

Not applicable

**Label elements**

**Signal word - Danger**



**Hazard statements**

H260 - In contact with water releases flammable gases which may ignite spontaneously  
H302 - Harmful if swallowed  
H314 - Causes severe skin burns and eye damage  
H332 - Harmful if inhaled  
H335 - May cause respiratory irritation  
H360 - May damage fertility or the unborn child  
H362 - May cause harm to breast-fed children  
H372 - Causes damage to organs through prolonged or repeated exposure

**Precautionary statements**

P270 - Do not eat, drink or smoke when using this product  
P501 - Dispose of contents/ container to an approved waste disposal plant  
P271 - Use only outdoors or in a well-ventilated area  
P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing  
P280 - Wear protective gloves/protective clothing/eye protection/face protection  
P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting  
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  
P310 - Immediately call a POISON CENTER or doctor/physician  
P363 - Wash contaminated clothing before reuse  
P405 - Store locked up  
P332 + P313 - If skin irritation occurs: Get medical advice/attention  
P201 - Obtain special instructions before use  
P308 + P313 - IF exposed or concerned: Get medical advice/attention  
P263 - Avoid contact during pregnancy/while nursing  
P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing

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P403 + P233 - Store in a well-ventilated place. Keep container tightly closed  
P260 - Do not breathe dust/fume/gas/mist/vapors/spray  
P223 - Keep away from any possible contact with water, because of violent reaction and possible flash fire  
P231 + P232 - Handle under inert gas. Protect from moisture  
P335 + P334 - Brush off loose particles from skin. Immerse in cool water/wrap in wet bandages  
P370 + P378 - In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish  
P402 + P404 - Store in a dry place. Store in a closed container

**Other Hazards Known**

Not applicable

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

**Substance**

Not applicable

**Mixture**

**Chemical Family** Battery, Manganese Dioxide Lithium (Perchlorate).  
**Chemical nature** Battery.

Percent ranges are used where confidential product information is applicable.

Chemical name	CAS No.	Percent Range	HMRIC #
Manganese oxide (MnO <sub>2</sub> )	1313-13-9	60 - 70%	-
Lithium	7439-93-2	3 - 7%	-
Ethylene glycol dimethyl ether	110-71-4	1 - 5%	-
Perchloric acid, lithium salt	7791-03-9	1 - 5%	-

**4. FIRST AID MEASURES**

**Description of first aid measures**

**General advice** Show this safety data sheet to the doctor in attendance. Immediate medical attention is required.

**Inhalation** Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur. Get immediate medical advice/attention.

**Eye contact** Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.

**Skin contact** Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get immediate medical advice/attention.

**Ingestion** Do NOT induce vomiting. Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Get immediate medical advice/attention.

**Self-protection of the first aider** Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Avoid contact with skin, eyes or clothing. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation.

**Most important symptoms and effects, both acute and delayed**

**Symptoms** Burning sensation. Coughing and/ or wheezing. Difficulty in breathing.

**Indication of any immediate medical attention and special treatment needed**

**Note to physicians** Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure.

**5. FIRE-FIGHTING MEASURES**

**Suitable Extinguishing Media** Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

**Unsuitable Extinguishing Media** Caution: Use of water spray when fighting fire may be inefficient.

**Specific hazards arising from the chemical** The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating gases and vapors.

**Hazardous combustion products** May emit acrid smoke and fumes.

**Special protective equipment for fire-fighters** Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear.

**6. ACCIDENTAL RELEASE MEASURES**

**U.S. Notice** Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations should respond to a spill involving chemicals.

**Personal precautions, protective equipment and emergency procedures**

**Personal precautions** Attention! Corrosive material. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Avoid generation of dust. Do not breathe dust.

**Other Information** Refer to protective measures listed in Sections 7 and 8.

**Environmental precautions**

**Environmental precautions** Prevent further leakage or spillage if safe to do so. Should not be released into the environment. Do not allow to enter into soil/subsoil. Prevent product from entering drains.

**Methods and material for containment and cleaning up**

**Methods for containment** Prevent further leakage or spillage if safe to do so.

**Methods for cleaning up** Pick up and transfer to properly labeled containers.

**Prevention of secondary hazards** Clean contaminated objects and areas thoroughly observing environmental regulations.

**Reference to other sections** See section 8 for more information. See section 13 for more information.

**7. HANDLING AND STORAGE**

**Precautions for safe handling**

**Advice on safe handling** Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. In case of insufficient ventilation, wear suitable respiratory equipment. Handle product only in closed system or provide appropriate exhaust ventilation. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash before reuse. Remove contaminated clothing and shoes. Avoid breathing vapors or mists.

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

**Storage Conditions** Keep containers tightly closed in a dry, cool and well-ventilated place. Keep out of the reach of children. Protect from moisture. Store away from other materials.

**Flammability class** Not applicable

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

**Control parameters**

**Exposure Guidelines**

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Manganese oxide (MnO <sub>2</sub> ) CAS#: 1313-13-9	TWA: 0.02 mg/m <sup>3</sup> TWA: 0.1 mg/m <sup>3</sup>	(vacated) Ceiling: 5 mg/m <sup>3</sup> Ceiling: 5 mg/m <sup>3</sup>	IDLH: 500 mg/m <sup>3</sup> Mn TWA: 1 mg/m <sup>3</sup> Mn STEL: 3 mg/m <sup>3</sup> Mn

**Appropriate engineering controls**

**Engineering Controls** Showers  
 Eyewash stations  
 Ventilation systems.

**Individual protection measures, such as personal protective equipment**

**Respiratory protection** No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

**Hand Protection** Wear suitable gloves. Impervious gloves.

**Eye/face protection** Face protection shield.

**Skin and body protection** Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron.

**General Hygiene Considerations** Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Contaminated work clothing should not be allowed out of the workplace. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product. Avoid breathing dust/fume/gas/mist/vapors/spray.

**Environmental exposure controls** Local authorities should be advised if significant spillages cannot be contained. Do not allow into any sewer, on the ground or into any body of water.

**Thermal hazards** None under normal processing.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

### Information on basic physical and chemical properties

<b>Physical state</b>	Solid	<b>Color</b>	Not applicable
<b>Appearance</b>	Battery	<b>Odor threshold</b>	Not applicable
<b>Odor</b>	Not applicable		

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
Molecular weight	Not applicable	
pH	Not applicable	
Melting point/freezing point	No data available	
Boiling point / boiling range	No data available	
Evaporation rate	Not applicable	
Vapor pressure	Not applicable	
Vapor density (air = 1)	Not applicable	
Specific gravity (water = 1 / air = 1)	Not applicable	
Partition Coefficient (n-octanol/water)	No data available	
Soil Organic Carbon-Water Partition Coefficient	No data available	
Autoignition temperature	No data available	
Decomposition temperature	No data available	
Dynamic viscosity	Not applicable	
Kinematic viscosity	Not applicable	

### Solubility(ies)

#### Water solubility

<u>Water solubility classification</u>	<u>Water solubility</u>	<u>Water Solubility Temperature</u>
No information available	No data available	No information available

#### Solubility in other solvents

<u>Chemical Name</u>	<u>Solubility classification</u>	<u>Solubility</u>	<u>Solubility Temperature</u>
None reported	No information available	No data available	No information available

### Other Information

#### Metal Corrosivity

Steel Corrosion Rate	No data available
Aluminum Corrosion Rate	No data available

**Volatile Organic Compounds (VOC) Content**  
 See ingredients information below

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Chemical name	CAS No.	Volatile organic compounds (VOC) content	CAA (Clean Air Act)
Manganese oxide (MnO <sub>2</sub> )	1313-13-9	No data available	-
Lithium	7439-93-2	No data available	-
Ethylene glycol dimethyl ether	110-71-4	No data available	X
Perchloric acid, lithium salt	7791-03-9	No data available	-

#### Explosive properties

Upper explosion limit Not applicable  
Lower explosion limit No data available

#### Flammable properties

Flash point No data available

#### Flammability Limit in Air

Upper flammability limit No data available  
Lower flammability limit No data available

#### Oxidizing properties

No data available.

#### Bulk density

No data available

Particle Size No information available

Particle Size Distribution No information available

## 10. STABILITY AND REACTIVITY

#### Reactivity

Not applicable.

#### Chemical stability

Stability Stable under normal conditions.

#### Explosion data

Sensitivity to Mechanical Impact None  
Sensitivity to Static Discharge None.

#### Possibility of Hazardous Reactions

Possibility of Hazardous Reactions None under normal processing.

#### Hazardous polymerization

Hazardous polymerization does not occur.

#### Conditions to avoid

Conditions to avoid Exposure to air or moisture over prolonged periods. Excessive heat.

#### Incompatible materials

Incompatible materials Acids. Bases. Oxidizing agent.

#### Hazardous Decomposition Products

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

## 11. TOXICOLOGICAL INFORMATION

#### Information on Likely Routes of Exposure

**Product Information**

**Inhalation** Corrosive by inhalation. Inhalation of corrosive fumes/gases may cause coughing, choking, headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs. Pulmonary edema can be fatal. May cause irritation of respiratory tract. Harmful by inhalation.

**Eye contact** Causes burns. Corrosive to the eyes and may cause severe damage including blindness. Causes serious eye damage. May cause irreversible damage to eyes.

**Skin contact** Corrosive. Causes severe burns. Avoid contact with skin and clothing.

**Ingestion** Causes burns. Ingestion causes burns of the upper digestive and respiratory tracts. May cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung damage if swallowed. May be fatal if swallowed and enters airways.

**Symptoms** Redness. Burning. May cause blindness. Coughing and/ or wheezing.

**Aggravated Medical Conditions** Eye disorders. Skin disorders. Respiratory disorders. Blood disorders. Kidney disorders.  
**Toxicologically synergistic products** None known.  
**Toxicokinetics, metabolism and distribution** No information available.

**Product Acute Toxicity Data**

Oral Exposure Route No data available  
 Dermal Exposure Route No data available  
 Inhalation (Dust/Mist) Exposure Route No data available  
 Inhalation (Vapor) Exposure Route No data available  
 Inhalation (Gas) Exposure Route No data available

**Unknown Acute Toxicity**

20% of the mixture consists of ingredient(s) of unknown toxicity.

**Acute Toxicity Estimations (ATE)**

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral)	667.00 mg/kg
ATEmix (dermal)	No information available
ATEmix (inhalation-dust/mist)	2.00 mg/L
ATEmix (inhalation-vapor)	14.15 mg/L
ATEmix (inhalation-gas)	No information available

**Ingredient Acute Toxicity Data**

Oral Exposure Route				If available, see data below	
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Manganese oxide (MnO <sub>2</sub> ) (60 - 70%) CAS#: 1313-13-9	Rat LD <sub>50</sub>	> 3480 mg/kg	None reported	None reported	GESTIS (Information System on Hazardous Substances of the German Social Accident Insurance)

Dermal Exposure Route If available, see data below  
 Inhalation (Dust/Mist) Exposure Route If available, see data below  
 Inhalation (Vapor) Exposure Route If available, see data below

Chemical name	Endpoint	Reported	Exposure	Toxicological effects	Key literature references and
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	type	dose	time		sources for data
Ethylene glycol dimethyl ether (1 - 5%) CAS#: 110-71-4	Rat LC <sub>50</sub>	>= 20 mg/L	4 hours	None reported	CHEMVIEW

Inhalation (Gas) Exposure Route

If available, see data below

**Product Specific Target Organ Toxicity Single Exposure Data**

Oral Exposure Route

No data available

Dermal Exposure Route

No data available

Inhalation (Dust/Mist) Exposure Route

No data available

Inhalation (Vapor) Exposure Route

No data available

Inhalation (Gas) Exposure Route

No data available

**Ingredient Specific Target Organ Toxicity Single Exposure Data**

Oral Exposure Route

If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Ethylene glycol dimethyl ether (1 - 5%) CAS#: 110-71-4	Rat LD <sub>Lo</sub>	1000 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)

Dermal Exposure Route

If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Ethylene glycol dimethyl ether (1 - 5%) CAS#: 110-71-4	Rabbit LD <sub>Lo</sub>	2000 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)

Inhalation (Dust/Mist) Exposure Route

If available, see data below

Inhalation (Vapor) Exposure Route

If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Ethylene glycol dimethyl ether (1 - 5%) CAS#: 110-71-4	Rat LC <sub>Lo</sub>	63000 mg/m <sup>3</sup>	6 hours	<b>Behavioral</b> Somnolence (general depressed activity) Irritability	RTECS (Registry of Toxic Effects of Chemical Substances)
Ethylene glycol dimethyl ether (1 - 5%) CAS#: 110-71-4	Human	None reported	None reported	<b>Behavioral</b> Dizziness <b>Lungs, Thorax, or Respiration</b> Respiratory depression Difficulty in breathing	HSDB (Hazardous Substances Data Bank)

Inhalation (Gas) Exposure Route

If available, see data below

**Aspiration toxicity**

If available, see data below

Kinematic viscosity

Not applicable

**Product Skin Corrosion/Irritation Data**

No data available.

**Ingredient Skin Corrosion/Irritation Data**

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Manganese oxide	Existing human	Human	None	None	Not corrosive or	IUCLID (The

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(MnO <sub>2</sub> ) (60 - 70%) CAS#: 1313-13-9	experience		reported	reported	irritating to skin	International Uniform Chemical Information Database)
Ethylene glycol dimethyl ether (1 - 5%) CAS#: 110-71-4	Standard Draize Test	Rabbit	0.5 mL	24 hours	Skin irritant	ECHA (The European Chemicals Agency)

**Product Serious Eye Damage/Eye Irritation Data**

No data available.

**Ingredient Eye Damage/Eye Irritation Data**

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Manganese oxide (MnO <sub>2</sub> ) (60 - 70%) CAS#: 1313-13-9	Existing human experience	Human	None reported	None reported	Not corrosive or irritating to eyes	IUCLID (The International Uniform Chemical Information Database)
Ethylene glycol dimethyl ether (1 - 5%) CAS#: 110-71-4	Standard Draize Test	Rabbit	0.1 mL	24 hours	Not corrosive or irritating to eyes	ECHA (The European Chemicals Agency)

**Sensitization Information**

**Product Sensitization Data**

**Skin Sensitization Exposure Route**  
**Respiratory Sensitization Exposure Route**

No data available.  
No data available.

**Ingredient Sensitization Data**

**Skin Sensitization Exposure Route**

If available, see data below.

Chemical name	Test method	Species	Results	Key literature references and sources for data
Ethylene glycol dimethyl ether (1 - 5%) CAS#: 110-71-4	Local Lymph Node Assay	Mouse	Not confirmed to be a skin sensitizer	ECHA (The European Chemicals Agency)

**Respiratory Sensitization Exposure Route**

If available, see data below.

**Chronic Toxicity Information**

**Product Specific Target Organ Toxicity Repeat Dose Data**

**Oral Exposure Route**  
**Dermal Exposure Route**  
**Inhalation (Dust/Mist) Exposure Route**  
**Inhalation (Vapor) Exposure Route**  
**Inhalation (Gas) Exposure Route**

No data available.  
No data available.  
No data available.  
No data available.  
No data available.

**Ingredient Specific Target Organ Toxicity Repeat Exposure Data**

**Oral Exposure Route**

If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Ethylene glycol dimethyl ether (1 - 5%) CAS#: 110-71-4	Mouse TD <sub>Lo</sub>	16000 mg/kg	8 days	Chronic Death	RTECS (Registry of Toxic Effects of Chemical Substances)

**Dermal Exposure Route**

If available, see data below

**Inhalation (Dust/Mist) Exposure Route**

If available, see data below

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**Inhalation (Vapor) Exposure Route**

If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Ethylene glycol dimethyl ether (1 - 5%) CAS#: 110-71-4	Rat TC <sub>Lo</sub>	4000 mg/L	14 days	<b>Behavioral</b> Change in psychophysiological tests <b>Lungs, Thorax, or Respiration</b> Other changes <b>Chronic</b> Death	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Ethylene glycol dimethyl ether (1 - 5%) CAS#: 110-71-4	Rat TC <sub>Lo</sub>	18000 mg/m <sup>3</sup>	5 days	<b>Lungs, Thorax, or Respiration</b> Other changes <b>Gastrointestinal</b> Other effects <b>Chronic</b> Death	RTECS (Registry of Toxic Effects of Chemical Substances)

**Inhalation (Gas) Exposure Route**

If available, see data below

**Product Carcinogenicity Data**

Oral Exposure Route

No data available

Dermal Exposure Route

No data available

Inhalation (Dust/Mist) Exposure Route

No data available

Inhalation (Vapor) Exposure Route

No data available

Inhalation (Gas) Exposure Route

No data available

**Ingredient Carcinogenicity Data**

Chemical name	CAS No.	ACGIH	IARC	NTP	OSHA
Manganese oxide (MnO <sub>2</sub> )	1313-13-9	-	-	-	-
Lithium	7439-93-2	-	-	-	-
Ethylene glycol dimethyl ether	110-71-4	-	-	-	-
Perchloric acid, lithium salt	7791-03-9	-	-	-	-

**Legend**

ACGIH (American Conference of Governmental Industrial Hygienists)	Does not apply
IARC (International Agency for Research on Cancer)	Does not apply
NTP (National Toxicology Program)	Does not apply
OSHA (Occupational Safety and Health Administration of the US Department of Labor)	Does not apply

Oral Exposure Route

If available, see data below

Dermal Exposure Route

If available, see data below

Inhalation (Dust/Mist) Exposure Route

If available, see data below

Inhalation (Vapor) Exposure Route

If available, see data below

Inhalation (Gas) Exposure Route

If available, see data below

**Product Germ Cell Mutagenicity *in vitro* Data**

No data available.

**Ingredient Germ Cell Mutagenicity *in vitro* Data**

If available, see data below

Chemical name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Ethylene glycol	Mutation in	<i>Salmonella</i>	0.010	None	Negative test result	ECHA (The

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dimethyl ether (1 - 5%) CAS#: 110-71-4	microorganisms	<i>typhimurium</i>	mg/plate	reported	for mutagenicity	European Chemicals Agency)
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**Product Germ Cell Mutagenicity *in vivo* Data**

Oral Exposure Route No data available  
 Dermal Exposure Route No data available  
 Inhalation (Dust/Mist) Exposure Route No data available  
 Inhalation (Vapor) Exposure Route No data available  
 Inhalation (Gas) Exposure Route No data available

**Ingredient Germ Cell Mutagenicity *in vivo* Data**

Oral Exposure Route If available, see data below

Chemical name	Test	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Ethylene glycol dimethyl ether (1 - 5%) CAS#: 110-71-4	Micronucleus test	Mouse	2000 mg/kg	12 weeks	Negative test result for mutagenicity	ECHA (The European Chemicals Agency)

Dermal Exposure Route If available, see data below  
 Inhalation (Dust/Mist) Exposure Route If available, see data below  
 Inhalation (Vapor) Exposure Route If available, see data below  
 Inhalation (Gas) Exposure Route If available, see data below

**Product Reproductive Toxicity Data**

Oral Exposure Route No data available  
 Dermal Exposure Route No data available  
 Inhalation (Dust/Mist) Exposure Route No data available  
 Inhalation (Vapor) Exposure Route No data available  
 Inhalation (Gas) Exposure Route No data available

**Ingredient Reproductive Toxicity Data**

Oral Exposure Route If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Ethylene glycol dimethyl ether (1 - 5%) CAS#: 110-71-4	Rat	660 mg/kg	18 days	<b>Effects on Fertility</b> Post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants) <b>Specific Developmental Abnormalities</b> Musculoskeletal system Homeostasis <b>Effects on Newborn</b> Stillbirth Live birth index (# fetuses per litter measured after birth) Viability index (e.g. # alive at day 4 per # born alive) Growth statistics (e.g. % reduced weight gain)	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Ethylene glycol dimethyl ether (1 - 5%) CAS#: 110-71-4	Mouse	361 mg/kg	11 days	<b>Effects on Embryo or Fetus</b> Fetotoxicity (except death e.g. stunted fetus) <b>Specific Developmental Abnormalities</b> Musculoskeletal system	RTECS (Registry of Toxic Effects of Chemical Substances)

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**Dermal Exposure Route**

If available, see data below

**Inhalation (Dust/Mist) Exposure Route**

If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Manganese oxide (MnO <sub>2</sub> ) (60 - 70%) CAS#: 1313-13-9	Mouse TC <sub>Lo</sub>	0.085 mg/L	17 days	<b>Effects on Newborn</b> Decrease in average pup weight at birth Decreased activity levels	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Manganese oxide (MnO <sub>2</sub> ) (60 - 70%) CAS#: 1313-13-9	Mouse TC <sub>Lo</sub>	0.049 mg/L	18 days	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)

**Inhalation (Vapor) Exposure Route**

If available, see data below

**Inhalation (Gas) Exposure Route**

If available, see data below

**12. ECOLOGICAL INFORMATION**

**Ecotoxicity**

**Product Ecological Data**

**Aquatic toxicity**

**Fish** No data available  
**Crustacea** No data available  
**Algae** No data available

**Ingredient Ecological Data**

**Aquatic toxicity**

**Fish** If available, see ingredient data below  
**Crustacea** If available, see ingredient data below  
**Algae** No data available

**Other Information**

**Persistence and degradability**

**Product Biodegradability Data**

No data available.

**Ingredient Biodegradability Data**

Chemical name	Test method	Biodegradation	Exposure time	Results
Ethylene glycol dimethyl ether (1 - 5%) CAS#: 110-71-4	OECD Test No. 302B: Inherent Biodegradability: Zahn-Wellens/ EVPA Test	16%	48 days	Not readily biodegradable

**Bioaccumulation**

**Product Bioaccumulation Data**

No data available.

**Partition Coefficient (n-octanol/water)** No data available

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**Ingredient Bioaccumulation Data**

Chemical name	Test method	Exposure time	Species	Bioconcentration factor (BCF)	Results
Ethylene glycol dimethyl ether (1 - 5%) CAS#: 110-71-4	Estimation through BCFBAF v3.01 part of the Estimation Programs Interface (EPI) Suite™	None reported	None reported	BCF = 3.162	Does not have the potential to bioaccumulate

**Mobility**

Soil Organic Carbon-Water Partition Coefficient No data available

**Water solubility**

Water solubility classification	Water solubility	Water Solubility Temperature
No information available	No data available	No information available

**Other adverse effects**

Contains a substance with an endocrine-disrupting potential.

**13. DISPOSAL CONSIDERATIONS**

**Waste treatment methods**

**Waste from residues/unused products** Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.

**Contaminated packaging** Do not reuse empty containers.

**US EPA Waste Number** Not applicable

**Special instructions for disposal** Do NOT incinerate or subject battery to temperatures in excess of 212 degrees fahrenheit. Cells may rupture. Perchlorate Material - special handling may apply. In California, see [www.dtsc.ca.gov/hazardouswaste/perchlorate](http://www.dtsc.ca.gov/hazardouswaste/perchlorate). Lithium- manganese dioxide batteries are not listed as a hazardous waste. Recycle at an approved recycling facility or dispose as ordinary waste.

**14. TRANSPORT INFORMATION**

**U.S. DOT**

UN/ID no UN3090  
 Proper shipping name Lithium Battery  
 Hazard Class 9  
 Packing Group II  
 Emergency Response Guide Number 138

**TDG**

UN/ID no UN3090  
 Proper shipping name Lithium Battery  
 Hazard Class 9  
 Packing Group II

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**IATA**

**UN/ID no** UN3090  
**Proper shipping name** Lithium Battery  
**Hazard Class** 9  
**Packing Group** II  
**ERG Code** 138

**IMDG**

**UN/ID no** UN3090  
**Proper shipping name** Lithium Battery  
**Hazard Class** 9  
**Packing Group** II

**Additional information**

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods. If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

**15. REGULATORY INFORMATION**

**National Inventories**

**TSCA** Complies  
**DSL/NDSL** Complies

**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory

**DSL/NDSL** - Canadian Domestic Substances List/Non-Domestic Substances List

**International Inventories**

**EINECS/ELINCS** Complies  
**ENCS** Complies  
**IECSC** Complies  
**KECL** Complies  
**PICCS** Does not comply  
**TCSI** Complies  
**AICS** Complies  
**NZIoC** Complies

**EINECS/ELINCS** - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

**ENCS** - Japan Existing and New Chemical Substances

**IECSC** - China Inventory of Existing Chemical Substances

**KECL** - Korean Existing and Evaluated Chemical Substances

**PICCS** - Philippines Inventory of Chemicals and Chemical Substances

**TCSI** - Taiwan Chemical Substances Inventory

**AICS** - Australian Inventory of Chemical Substances

**NZIoC** - New Zealand Inventory of Chemicals

**US Federal Regulations**

**SARA 313**

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

<b>Chemical name</b>	<b>SARA 313 - Threshold Values %</b>
Manganese oxide (MnO <sub>2</sub> ) (CAS #: 1313-13-9)	1.0
Ethylene glycol dimethyl ether (CAS #: 110-71-4)	1.0

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**SARA 311/312 Hazard Categories**

Acute health hazard	Yes
Chronic Health Hazard	Yes
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

**CWA (Clean Water Act)**

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

**CERCLA**

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

**US State Regulations**

**California Proposition 65**

This product does not contain any Proposition 65 chemicals

IMERC: Not applicable

**U.S. State Right-to-Know Regulations**

Chemical name	New Jersey	Massachusetts	Pennsylvania
Manganese oxide (MnO2) 1313-13-9	X	-	X
Lithium 7439-93-2	X	X	X
Ethylene glycol dimethyl ether 110-71-4	X	X	X

**U.S. EPA Label Information**

**16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION**

**Special Comments**

None

**Additional information**

**Global Automotive Declarable Substance List (GADSL)**

Chemical name	Global Automotive Declarable Substance List Classifications	Global Automotive Declarable Substance List Thresholds
Ethylene glycol dimethyl ether 110-71-4	Declarable Substance (FI)	0.0 %
Perchloric acid, lithium salt 7791-03-9	Declarable Substance (FA)	0.1 %

**NFPA and HMIS Classifications**



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NFPA	Health hazards - 3	Flammability - 0	Instability - 0	Physical and chemical properties W
HMIS	Health hazards - 3 - *	Flammability - 0	Physical hazards - 0	Personal protection - X

**Key or legend to abbreviations and acronyms used in the safety data sheet**

NIOSH IDLH *Immediately Dangerous to Life or Health*  
 ACGIH ACGIH (American Conference of Governmental Industrial Hygienists)  
 NDF *no data*

**Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
MAC	Maximum Allowable Concentration	Ceiling	Ceiling Limit Value
X	Listed	Vacated	These values have no official status. The only binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state regulations.
SKN*	Skin designation	SKN+	Skin sensitization
RSP+	Respiratory sensitization	**	Hazard Designation
C	Carcinogen	R	Reproductive toxicant
M	mutagen		

Prepared By Hach Product Compliance Department  
 Issue Date 19-Sep-2018  
 Revision Date 19-Sep-2018  
 Revision Note None

**Disclaimer**

**USER RESPONSIBILITY:** Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

**THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.**

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End of Safety Data Sheet

