

Safety Data Sheet

29 CFR 1910.1200

Effective Date : 01/01-2024

Trade Name: Manganese Dioxide Lithium Battery

1 Identification

• **Product identifier**

• **Trade name : Manganese Dioxide Lithium Battery**

• **Item No.:**

CR3032、CR2477、CR2450、CR2430、CR2032、CR2025、CR2016、CR1632、CR1620、CR1616、CR1220、CR1216、CR1025、CR927

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

• **Application of the substance / the preparation :** Electronic products

• **Remark :**

*This sample is likely to be classified as article and is out of scope of a SDS as set out in 29 CFR Part 1910.1200. This SDS is generated for client's reference only.

2 Hazard(s) identification

• **Classification of the substance or mixture**

Classification according to OSHA Hazard Communication Standard (29 CFR



GHS08 Health hazard

Carc. 2 H351 Suspected of causing cancer.
STOT RE 1 H372 Causes damage to organs through prolonged or repeated exposure.



GHS05 Corrosion

Eye Dam. 1 H318 Causes serious eye damage.



GHS07

Acute Tox. 4 H302 Harmful if swallowed.
Skin Irrit. 2 H315 Causes skin irritation.
Skin Sens. 1 H317 May cause an allergic skin reaction.

• **Information concerning particular hazards for human and environment :**

The product has to be labeled due to the calculation procedure of OSHA Hazard Communication Standard (29 CFR 1910.1200).

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• Classification system :

The classification is according to the latest edition of OSHA Hazard Communication Standard (29 CFR 1910.1200), and extended by company and literature data.

• Label elements

• Labeling according to OSHA Hazard Communication Standard (29 CFR 1910.1200)

• Hazard pictograms



GHS05 GHS07 GHS08

• Signal word: Danger

• Hazard-determining components of labeling :

manganese dioxide
lithium
nickel
lithium perchlorate

• Hazard statements

H302 Harmful if swallowed.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H317 May cause an allergic skin reaction.
H351 Suspected of causing cancer.
H372 Causes damage to organs through prolonged or repeated exposure.

• Precautionary statements

P260 Do not breathe dusts/ fume/gas/mist/vapors/spray.
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/doctor.
P321 Specific treatment (see on this label).
P405 Store locked up.
P501 Dispose of contents/container in accordance with local / regional / national / international regulations.

• Hazards not otherwise classified (HNOC) No further relevant information available.

3 Composition / information on ingredients

• Chemical characterization: Mixtures

• Description:

Mixture of the substances listed below with nonhazardous additions.
For the wording of listed risk phrases refer to section 16.

• Composition:		
7439-89-6	iron	43.5-46%
1313-13-9	manganese dioxide Acute Tox.4, H302; Acute Tox. 4, H332	18.69-29.30%
7440-47-3	chromium	11.0-12.5%
108-32-7	propylene carbonate Eye Irrit. 2, H319	9.2-9.76%

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7439-93-2	lithium	1.2-3.5%
	Water-react. 1, H260 ; Skin Corr. 1B, H314	
7782-42-5	Graphite	2.4-3.0%
9003-07-0	Polypropylene	1.6-2.0%
7791-03-9	lithium perchlorate	1.2-1.29%
	Ox. Sol. 1, H271; Acute Tox. 3, H301; Skin Irrit.. 2, H315; Eye Irrit. 2A, H319; STOT SE 3, H335	
7440-02-0	nickel	0.4-1.24%
	Carc. 2, H351; STOT RE 1, H372; Skin Sens. 1, H317	
65997-17-3	glass, oxide, chemicals	0.47-0.8%
7439-96-5	manganese	0.17-0.33%
	Flam. Sol. 1, H228; Water-react. 1, H260	
8052-42-4	Asphalt	0.17-0.28%
	Carc. 2, H351	

• Remark:

iron (CAS:7439-89-6)

Note: Fe

manganese (CAS:7439-96-5)

Note: Mn

chromium (CAS:7440-47-3)

Note: Cr

nickel (CAS:7440-02-0)

Note: Ni

manganese dioxide (CAS:1313-13-9)

Note: MnO₂

Graphite (CAS:7782-42-5)

Note: C

lithium (CAS:7439-93-2)

Note: Li

Polypropylene (CAS: 9003-07-0)

Note: PP

4 First-aid measures

• Description of first aid measures

• General description:

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

• After inhalation:

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

Remove from exposure and move to fresh air immediately. Use oxygen if available.

• After skin contact:

Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes.

Get medical aid.

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- **After eye contact:**
Flush eyes with plenty of water for at least 15minutes, occasionally lifting the upper and lower eyelids.
Get medical aid.
- **After swallowing:**
Give at least 2 glasses of milk or water. Induce vomiting unless patient is unconscious.
Call a physician.
- **Most important symptoms and effects, both acute and delayed** No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

- **Suitable extinguishing agents:**
CO₂ or extinguishing powder. Fight larger fires with alcohol resistant foam.
- **Special hazards arising from the substance or mixture:** No further relevant information available.
- **Special protective equipment and precautions for firefighters**
- **Protective equipment:** Mouth respiratory protective device.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures:** Not required.
- **Environmental precautions:**
Do not allow product to reach sewage system or any water course.
Inform respective authorities in case of seepage into water course or sewage system.
Do not allow to enter sewers/surface or ground water.
- **Methods and material for containment and cleaning up:**
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.

7 Handling and storage

- **Precautions for safe handling:**
Thorough dedusting.
Ensure good ventilation/exhaustion at the workplace.
- **Information about protection against explosions and fires:** No special measures required.
- **Storage:**
- **Conditions for safe storage, including any incompatibilities**
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** Keep receptacle tightly sealed.
- **Specific end use(s):** No further relevant information available.

8 Exposure controls / personal protection

- **Components with limit values that require monitoring at the workplace:**

1313-13-9 manganese dioxide (18.69-29.30%)

PEL (USA)	Ceiling limit value: 5mg/m ³ as Mn
REL (USA)	Short-term value: 3mg/m ³ Long-term value: 1mg/m ³ as Mn
TLV (USA)	Long-term value: 0.02*0.1* mg/m ³ as Mn; * respirable **inhalable fraction

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7440-47-3 chromium (11.0-12.5%)	
PEL(USA)	Long-term value: 1*0.5**mg/ m ³ *metal; **inorganic compds., as Cr
REL (USA)	Long-term value: 0.5*mg/ m ³ *metal+inorg.compds.as Cr; See Pocket Guide App. C
TLV(USA)	Long-term value: 0.5*mg/ m ³
7782-42-5 Graphite (2.4-3.0%)	
PEL (USA)	Long-term value: 15mppcf*mg/m ³ *impinge samples counted by light field techn.
REL (USA)	Long-term value: 2.5mg/m ³ *respirable dust
TLV(USA)	Long-term value: 2*mg/m ³ all forms except graphite fibers; *resp. fraction
7440-02-0 nickel (0.4-1.24%)	
PEL(USA)	Long-term value: 1mg/ m ³
REL(USA)	Long-term value: 0.015mg/ m ³ as Ni; See Pocket Guide App. A
TLV(USA)	Long-term value: 1.5mg/ m ³ elemental, *inhalable fraction
65997-17-3 glass, oxide, chemicals (0.47-0.8%)	
TWA(USA)	Long-term value: 5*mg/ m ³ *Inhalable fraction.
7439-96-5 manganese (0.17-0.33%)	
PEL (USA)	Ceiling limit value: 5mg/ m ³ as Mn
REL (USA)	Short-term value: 3mg/ m ³ Long-term value: 1mg/ m ³ fume, as Mn
TLV(USA)	Long-term value:0.02*0.1*mg/ m ³ as Mn; *respirable **inhalable fraction
8052-42-4 Asphalt (0.17-0.28%)	
REL(USA)	Ceiling limit value:5*mg/ m ³ *15-min; See Pocket Guide App. A
TLV(USA)	Long-term value:0.5* mg/ m ³ *inh. fraction; as benzene-soluble aerosol; BEIp

• Ingredients with biological limit values:

8052-42-4 Asphalt

BEI (USA)	- Medium: urine Time: end of shift at end of workweek Parameter: 1-Hydroxypyrene with hydrolysis (nonquantitative)
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- **Additional information:** The lists that were valid during the creation were used as basis.
- **Based on the composition shown in Section 3, the following measures are suggested for occupational safety measure.**
- **Appropriate engineering controls:**
 Keep away from foodstuffs, beverages and feed.
 Immediately remove all soiled and contaminated clothing.
 Wash hands before breaks and at the end of work.

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Avoid contact with the eyes.
Avoid contact with the eyes and skin.
See Section 7 for information about design of technical facilities.

• **Personal protective equipment:**

• **Breathing equipment:**

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

• **Protection of hands :**



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation.

• **Material of gloves**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

• **Penetration time of glove material:**

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

• **Eye protection:**



Tightly sealed goggles

9 Physical and chemical properties

• **General Information**

• **Appearance:**

Form: Solid

Color: Silvery

• **Odor:** Odorless

• **Odour threshold:** Not available

• **pH-value:** Not available

• **Change in condition**

Melting point/ Melting range: Not available

Freezing point: Not available

Boiling point/ Boiling range: Not available

• **Flash point:** Not available

• **Flammability (solid, gaseous):** Not available

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• Auto-Ignition temperature:	Not available
• Decomposition temperature:	Not available
• Explosion limits:	
Lower:	Not available
Upper:	Not available
• Vapor pressure:	Not available
• Density:	Not available
• Relative density:	Not available
• Vapour density:	Not available
• Evaporation rate:	Not available
• Solubility in/ Miscibility with	
Water:	Not available
• Partition coefficient (n-octanol/water)	Not available
• Viscosity:	
Dynamic:	Not available
Kinematic:	Not available
• Other information	Voltage 3.0V

10 Stability and reactivity

- **Reactivity:** Data not available
- **Chemical stability:** Stable under normal operating and storage conditions.
- **Possibility of hazardous reactions:** No dangerous reactions known.
- **Conditions to avoid:** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

• Acute toxicity:

• LD/LC50 values that are relevant for classification:

7439-89-6 iron

Oral	LD50	30000 mg/kg (rat)
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7439-96-5 manganese

Oral	LD50	9000 mg/kg (rat)
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108-32-7 propylene carbonate

Oral	LD50	29000 mg/kg (rat)
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- **Primary irritant effect:**
- **on the skin:** Irritant to skin and mucous membranes.
- **on the eye:** Irritating effect.
- **Sensitization:** Sensitization possible through skin contact.

• Additional toxicological information:

The product shows the following dangers according to internally approved calculation methods for preparations:

Harmful
Irritant

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. Carcinogenic categories

. IARC (International Agency for Research on Cancer)		
7440-47-3	chromium	3
9003-07-0	Polypropylene	3
7440-02-0	nickel	1
8052-42-4	Asphalt	2B

. NTP (National Toxicology Program)		
7440-02-0	nickel	R

. OSHA-Ca (Occupational Safety & Health Administration)
None of the ingredients is listed.


12 Ecological information

- . Toxicity
- . Aquatic toxicity: No further relevant information available.
- . Persistence and degradability: No further relevant information available.
- . Bioaccumulative potential: No further relevant information available.
- . Mobility in soil: No further relevant information available.
- . Other adverse effects: No further relevant information available.

13 Disposal considerations

- . Waste treatment methods
- . Recommendation:
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- . Uncleaned packagings:
- . Recommendation: Disposal must be made according to official regulations.

14 Transport information

. UN-Number	
. DOT, IMDG, IATA	UN3090
. UN proper shipping name	
. DOT	Lithium battery
. IMDG, IATA	LITHIUM METAL BATTERIES
. Transport hazard class (es)	
. DOT, IMDG, IATA	
	
. Class	9 Miscellaneous dangerous substances and articles
. Label	9
. Packing group	
. DOT, IMDG, IATA	IB
. Environmental hazards:	
. Marine pollutant:	No

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• Special precautions for user	Warning: Miscellaneous dangerous substances and articles
• EMS Number:	F-A, S-I
• Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable.
• UN "Model Regulation"	UN3090, LITHIUM METAL BATTERIES, 9, II

15 Regulatory information

- Safety, health and environmental regulations/legislation specific for the substance or mixture
- Sara

• Section 335 (extremely hazardous substances):

None of the ingredients is listed.

• Section 313 (specific toxic chemical listings):

1313-13-9	manganese dioxide
7440-47-3	chromium
7440-02-0	nickel
7439-96-5	manganese

• TSCA (Toxic Substances Control Act):

All ingredients are listed.

• Proposition 65

• Chemical known to cause cancer:

7440-02-0	nickel
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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.

• Cancerogenity categories

• EPA (Environmental Protection Agency)

1313-13-9	manganese dioxide	D
7440-47-3	chromium	D
7791-03-9	lithium perchlorate	NL
7439-96-5	manganese	D

• TLV (Threshold Limit Value established by ACGIH)

7440-47-3	chromium	A4
7440-02-0	nickel	A5
8052-42-4	Asphalt	A4

NIOSH-Ca (National Institution for Occupational Safety & Health)

7440-02-0	nickel
8052-42-4	Asphalt

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16 Other information

NFPA ratings (scale 0-4)



Health = 2
Fire = 0
Reactivity = 0

• HMIS ratings (scale 0-4)



Health = *1
Fire = 0
Reactivity = 0

• Relevant phrases

- H228 Flammable solid.
- H260 In contact with water releases flammable gases, which may ignite spontaneously.
- H271 May cause fire or explosion; strong oxidizer.
- H301 Toxic if swallowed.
- H302 Harmful if swallowed.
- H314 Causes severe skin burns and eye damage.
- H315 Causes skin irritation.
- H317 May cause an allergic skin reaction.
- H319 Causes serious eye irritation.
- H332 Harmful if inhaled.
- H335 May cause respiratory irritation.
- H351 Suspected of causing cancer.
- H372 Causes damage to organs through prolonged or repeated exposure.

The contents and format of this SDS are in accordance with 29 CFR 1910.1200 (g)

DISCLAIMER OF LIABILITY

The information in this SDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in anyway connected with the handling, storage, use or disposal of the product. This SDS was prepared and is to be used only for this product. If the product is used as a component in another product, this SDS information may not be applicable.

Remark:

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Date of preparation/last revision 2024.01. 01/-

Abbreviations and acronyms:

- IMDG: International Maritime Code for Dangerous Goods
- DOT: US Department of Transportation
- IATA: International Air Transport Association
- ACGIH: American Conference of Governmental Industrial Hygienists
- EINECS: European Inventory of Existing Commercial Chemical Substances
- ELINCS: European List of Notified Chemical Substances
- CAS: Chemical Abstracts Service (division of the American Chemical Society)
- LC50: Lethal concentration, 50 percent
- LD50: Lethal dose, 50 percent

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Flam. Sol. 1: Flammable solids, Hazard Category 1
Water-react. 1: Substances and Mixtures which, in contact with water, emit flammable gases, Hazard Category 1
Ox. Sol. 1: Oxidising Solids, Hazard Category 1
Acute Tox. 3: Acute toxicity, Hazard Category 3
Acute Tox. 4: Acute toxicity, Hazard Category 4
Skin Corr. 1B: Skin corrosion/irritation, Hazard Category 1B
Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2
Eye Dam. 1: Serious eye damage/eye irritation, Hazard Category 1
Eye Irrit. 2: Serious eye damage/eye irritation, Hazard Category 2
Eye Irrit. 2A: Serious eye damage/eye irritation, Hazard Category 2A
Skin Sens. 1: Sensitisation-Skin, Hazard Category 1
Carc. 2: Carcinogenicity, Hazard Category 2
STOT SE3: Specific target organ toxicity-Single exposure, Hazard Category 3
STOT RE 1: Specific target organ toxicity-Single exposure, Hazard Category 1

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