

Safety data sheet for chemical products

1.PRODUCT AND COMPANY IDENTIFICATION

- Product name: Manganese Dioxide Primary Lithium Battery
- Model: CR12600SE

- Supplier's Name: FDK CORPORATION
- Supplier's Address: 5-36-11 Shinbashi, Minato-Ku, Tokyo, 105-8677, Japan
- Telephone number +81-3-3434-1279

- Manufacturer's Name: FDK TOTTORI CO., LTD.
- Manufacturer's Address: 28 ,Ohta lwami-cho ,Tottori ,681-0063, Japan
- Manufacturer's Telephone number +81-857-73-1771

2.COMPOSITION / INFORMATION ON INGREDIENTS

- Substance or preparation: Preparation
- Information about the chemical nature of product:

Common chemical name / General name	CAS number	Concentration / Concentration range	Classification and Hazard labeling
Manganese Dioxide	1313-13-9	35-45%	Specific hazards
Lithium metal	7439-93-2	3.2% *	Water forbiddance
Mixture solvent of carbonate and ether	—	10-20%	Inflammability
Lithium Perchlorate (LiClO ₄)	7791-03-9		—

* Weight of Lithium per cell : 0.48g

3.HAZARDS IDENTIFICATION

- Most important hazard and effects: No information is obtained.
- Specific hazards: Since chemicals are contained in a sealed can, there are no hazards.
Lithium metal of contents sets off a chemical burn if it touches a skin.
- Emergency overview may also be given: The time when the battery is mechanically or electrically abused and when short circuit occurs.

4.FIRST-AID MEASURES

- Inhalation: In case content's vapor caused by blowout of a battery is inhaled, move to a place having fresh air immediately
- Skin contact: In case the content adheres to a skin, wash away with water and soap immediately.
- Eye contact: In case the content goes into an eye, wash away with much water for more than 15 minutes.
- Ingestion: A medical examination of a doctor is received quickly.

5.FIRE-FIGHTING MEASURE

- Suitable extinguishing media: Carbonic acid gas, powder, foam, atomized water
- Specific methods of fire fighting: Take batteries to a safe place not to be burnt down in a spreading fire.
In case batteries packaged in a box burn, since burning material is paper, use a water extinguisher, a CO₂ extinguisher, and a powder extinguisher as a normal extinguisher.
- Special equipment for the protection of firefighters:
Hand protection: a pair of flame-proof groves
Eye protection: face mask
Protective wear of skin and/or body: protective clothing

6.ACCIDENTAL RELEASE MEASURES

- Personal precautions: In case release is small and continues for short time, health condition does not turn bad.
 - Environmental precautions: Extinguish it quickly, or the bad odor will smoke up because the fire gets left for some time.
 - Cleaning method: Solid content gets moved into a container. In case of the scatter, wipe it on a dry towel.
 - Prevention of secondary hazards: In case of Lithium metal, it causes fever reacted by water in the air, ignition may occur deal with accidental release quickly.
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7.HANDLING AND STORAGE

- Handling
 - Prevention of user exposure: No problem on regular handling
 - Prevention of fire and explosion: No problem on regular handling
 - Precaution for prevention of local emission and powder dust:: No problem on regular handling
 - Storage
 - Technical measures: measures to avoid direct rays, high temperature, and high humidity
 - Incompatible products: Combustible things, conductive things (metal: cause of shot circuit)
 - Storage conditions (suitable): Low temperature and low humidity (a cool and dark place)
 - Storage conditions (to be avoid): High temperature and high humidity, and direct rays
 - Packing material (recommended): Excellent flame resisting, incombustible, and insulated material
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8.EXPOSURE CONTROLS / PERSONAL PROTECTION

- Engineering measures: regular handling doesn't cause scatters. If it should happen by destruction of batteries and so on, however, operate local emission device, or clear the air well
- Control parameters

Common chemical name / General name	ACGIH	
	TLV-TWA	BEI
Manganese dioxide	Mn: 0.2mg/m ³	—
Lithium metal	—	—
Mixture solvent of carbonate and ether	—	—
Lithium Perchlorate (LiClO ₄)	—	—

ACGIH :American Conference of Governmental Industrial Hygienists ,Inc.

TLV-TWA :Threshold Limit Value-time weighted average concentration

BEI :Biological Exposure Indices

- Personal protective equipment
 - There in no need on regular handling. Use the protections shown below when contents leaking out of batteries are dealt with.
 - Respiratory protection: Mask(with a filter preferably)
 - Hand protection: Synthetic rubber grove
 - Eye protection: Goggle or glass
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9.PHYSICAL AND CHEMICAL PROPERTIES

- Appearance
 - Physical state: Solid(SUS material)
 - Form: Cylindrical type
 - Color: Metallic color
 - Smell: odorless
- PH: Not applicable because of insolubility in water.
- Specific temperature/humidity at which physical state changes: No information because of mixture.
- Density: not mentioned because this product is a mixture.
- Solubility: insolubility in water

10.STABILITY AND REACTIVITY

- Stability : Stable on regular handling
 - Conditions to avoid: External short circuit of battery , deformation by crush, exposure at high temperature of more than 85 degree C (cause heat generation and ignition) direct ray, high humidity
 - Materials to avoid: Water, a chain, and a piece of metal that causes short circuit.
 - Hazardous decomposition product: Emitted acrid or poisonous gases in fire.
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11.TOXICOLOGICAL INFORMATION

- Since chemicals are contained in a sealed can, there are no hazards.

Components of Chemical substances are shown below.

Manganese Dioxide

Acute toxicity: rabbit *¹ : LD_{L0}(blue pipe)=45mg/kg, mouse*²: LD₅₀(subcutaneous)=422mg/kg

Local effects: Stimulus to an eye, a nose, a throat, and a skin

Chronic toxicity or long-term toxicity: Inhale powder dust or fume for a long time (at least 3 months), and that may cause specific central nerve symptom like Parkinson's disease.

Reproduction toxicity: Mouse*³ inhalation TCL₀=49mg/m³

Lithium metal

Acute toxicity: No information in a metal state

Local effects: Touching on a skin or an eye causes thermal burn and alkaline's chemical burn.

Carbonate

Acute toxicity: No information at present

Local effects: Slight stimulus to an eye

Ether

Acute toxicity: Rat*⁴ oral LD₅₀=7000mg/kg

Local effects: Light stimulus to a skin

Lithium Perchlorate (LiClO₄)

Acute toxicity: No information at present

Local effects: stimulus to a skin, a throat, an eye, and a nose.

12.ECOLOGICAL INFORMATION

- Possible environment impact/ ecotoxicity: Chemical substances do not influence on an environment because of being sealed in metal container.
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13.DISPOSAL CONSIDERATIONS

- Recommended methods for safe and environmentally preferred disposal

Product(waste from residues): Pack used batteries into an inner box not to tumble down to be short-circuiting. Pack the inner boxes into an outer box besides, and dispose of it by industrial-waste disposal company consignment-constructed.

Contaminated packaging: Container and/or package is/are not contaminated on regular usage.

In case contents leaking out of batteries adhere, deal with that as industrial waste subject to special control.

14.TRANSPORT INFORMATION

In the case of transportation, confirm no leakage and no overspill from a container. Take in a cargo of them without falling, dropping and breakage. Prevent collapse of cargo piles and wet by rain. The container must be handled carefully. Do not give shocks that result in a mark of hitting on a cell. Please refer to Section 7-HANDLING AND STORAGE also.

- UN classification: However this product's shipping name is "Lithium metal batteries"(or "Lithium metal batteries packed with equipment" or "Lithium metal batteries contained in equipment"), it is not recognized as "DANGEROUS GOODS" when its transport condition accords with "packing instruction 968 Section 2 of IATA-DGR" (or "packing instruction 969 Section 2" or "packing instruction 970 Section 2") or "special provision 188 of IMO-IMDG Code". *5 *6

15.REGULATORY INFORMATION

- Regulations specifically applicable to the product :
IATA-DGR (air transportation)
IMO-IMDG Code(sea transportation)
US Department of Transportation 49 Code of Federal Regulations [USA]

16.OTHER INFORMATION

- This material safety data sheet is offered in order to have handling safe about dangerous detrimental chemicals carried out.
- The entrepreneur who deals with it needs to consider this material safety data sheet as reference, and needs to devise suitable disposal in an entrepreneur's responsibility.
- Numerical values, such as a content and the physical-chemistry-characteristic, are not guarantee values among the written contents.

• Reference

- *1 Journal of the D.I Mendeleeva All-Union Chemical Society.
(V/O Mezhdunarodnaya knija, 113095 Moscow, USSR) V.5-1960
- *2 Merck Index; an Encyclopedia of Chemicals, Drugs, and Biologicals, 11st ed.,
Rahway, NJ 07065, Merck & Co., Inc. 1898
- *3 Federation of American Societies for Experimental Biology (Bethesda, MD) V.1-46, 1942-87
- *4 Ube Industries, LTD Chemical & plastic Division (internal measured data)
- *5 Dangerous Goods Regulations – 51th Edition Effective 1 January 2010: International Air Transport Association (IATA)
- *6 IMDG Code – 2008 Edition : International Maritime Organization(IMO)

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Creation Department : FDK TOTTORI CO., LTD.

Business Development Department
