

## MSDS Report

According to UN GHS (the 7th revised edition)

Issue date: Jan.05, 2018

Service requested: Material Safety Data Sheet for the Product

Version: 1.0

Applicant: Shenzhen Data Power Technology Limited

Applicant address : 5F,Wei dong Long Building,Meilong Road, Long hua District, SZ

Product name: Lithium Manganese Dioxide Battery

Job receiving date: February. 5, 2018

Preparation period: Jan. 02, 2018~ Dec. 30, 2018

Composition/Ingredient: Refer to MSDS content.

Issued by: Nande (China) Service of Testing  
Yinfeng Ind Zone, Hangcheng Street, Gushu, Xixiang,  
Bao'an Dist, Shenzhen, China

Written by: Linda  
(Linda)

Inspected by: Jose  
(Jose)



# Material Safety Data Sheet

Product name: Lithium Manganese Dioxide Battery    MSDS No.: E27.161.213.001.WFT

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## Section 1 - Product and Company Identification

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Product name: Lithium Manganese Dioxide Battery

Manufactory name: Data Power

Applicant/ Manufacturer: Shenzhen Data Power Technology Co.,LTD

Address: 5F, Wei dong Long Building, Meilong Road, Long hua District, SZ City, China

Tel: +86-755-23460581

Email: [info@dtpbattery.com](mailto:info@dtpbattery.com)

Fax: +86-755-23460503

Post code: 501109

Recommended use: Used for electronic instrument

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## Section 2 - Hazard Description

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For the battery cell, chemical materials are stored in a hermetically sealed metal case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, there is no physical danger of ignition or explosion and chemical danger. However, do not open, short-circuit, squeeze, burn, disassemble, expose to flame, mix different models, different chemical properties or different types of batteries. The battery cell case will be breached at the extreme, hazardous materials may be released.

Most important hazard and effects

Human health effects:

Inhalation: The steam of the electrolyte has an anesthesia action and stimulates a respiratory tract.

Skin contact: The steam of the electrolyte stimulates a skin. The electrolyte skin contact causes a sore and stimulation on the skin.

Eye contact: The steam of the electrolyte stimulates eyes. The electrolyte eye contact causes a sore and stimulation on the eye. Especially, substance that causes a strong inflammation of the eyes is contained.

Environmental effects: Since a battery cell remains in the environment, do not throw out it into the environment.

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## Section 3 - Composition / Ingredient Data

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Material

√Mixture

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Ingredient name	CAS No.	Wt%
Litium	7439-93-2	4.5-5.5
Carbon	7782-42-5	5.0-7.0
Manganese dioxide	1313-13-9	60-65
Aluminum	7429-90-5	8-10
Propylene carbonate	108-32-7	6-8
Lithium perchlorate	7791-03-9	1-2
1,2-dimethoxyethane	110-71-4	6-8

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## Section 4 - First Aid Measures

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Apply to leak out of the material from inside the Lithium Manganese Dioxide Batteries.

- 4.1. General advice: Show this safety data sheet to the doctor in attendance. After receiving the first-aid measure required, consult a physician if necessary.
- 4.2. Skin contact: Remove contaminated clothing and shoes immediately. Wash off with soap and plenty of water. If chemical burns or skin sustained stimulation, consult a physician immediately
- 4.3. Eyes contact: Check for and remove any contact lenses. Get medical attention. Immediately flush eyes with running water for at least 30 minutes, disappear until the chemical residues so far, keeping eyelids open. Provide a readily-accessible eyewash facility and quick-drench safety shower. Do not rubbing eyes with hand.
- 4.4. Inhalation: Move exposed person to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.
- 4.5. Ingestion: Wash out mouth with water. Move exposed person to fresh air. Keep person warm and at rest. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

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- 4.6. Most important symptoms and effects, both acute and delayed: See Section 2 and Section 11 for more information.
- 4.7. Immediate / special treatment: Symptomatic treatment and supportive therapy as indicated. Following severe exposure the patient should be kept under medical review for at least 48 hours.

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## Section 5 – Firefighting Measures

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- 5.1. Extinguishing media: In case of fire, water flooded ground fire. If the battery is burning, water may not be extinguished, but can use water cooling adjacent batteries so as to control the spread of fire. The preferred medium for small fire is carbon dioxide, dry powder, or foam extinguishing agent, but for the lithium battery is burning may be no use, the battery will burn until complete combustion. In fact, all lithium batteries can be controlled by water. However, when using water to produce hydrogen gas may be mixed with air to form explosive mixture. LITH-X (graphite powder) or copper powder fire extinguishers, sand, dry, powdered dolomite or soda can be used as smothering agent
- 5.3. Special hazards arising from the substance or mixture: In combustion emits toxic fumes, metallic oxides.
- 5.4. Advice for fire-fighter: Firefighters must wear self-contained breathing apparatus, wear full body fire suit, fire extinguishing in the upwind. As far as possible will be transferred to empty containers from the scene. Keep the fire water spray container cooling, until the end of fire.

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## Section 6 - Accidental Release Measures

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- 6.1. Personal precautions, protective equipment and emergency procedures: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).
- 6.2. Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.
- 6.3. Collecting, clearing method and disposal material: Small spill: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor. Large spill: Stop leak if without risk. Move containers from spill area. Approach the release from upwind.

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Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Local waste disposal regulations must be followed

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## Section 7 - Handling and Storage

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- 7.1. Precautions for handling: If the Lithium Manganese Dioxide Battery gives off an odor, generates heat, becomes discolored or deformed, or in any way appear abnormal during use, recharging or storage, immediately remove it from the device and stop using. Don't put the battery excessive vibration, avoid short circuit, however accidental short circuit for a short period of time will not have a serious impact on the battery. Long-term short circuit can make Lithium Manganese Dioxide Battery loss of energy, generate a lot of heat burn skin, and even cause a fire or explosion. Chaos of the battery in bulk in containers, coins, metal accessories, metal workbench, covered by or metal belt and so on Lithium Manganese Dioxide Battery device can be used for assembly is the source of cause a short-circuit. Transport or storage Lithium Manganese Dioxide Battery should have effective measures of prevent short circuit. Don't disassembly or damage to the battery. Away from heat, sparks, open flames and hot surfaces.
- 7.2. Precautions for storage: Stored in a cool, dry and ventilated place, may cause the Lithium Manganese Dioxide Battery performance loss under high temperature, leakage, rust. Don't expose the Lithium Manganese Dioxide Battery under the open flame, stored away from moisture.

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## Section 8 - Exposure Controls/ Personal Protection

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- 8.1. Exposure limit: Manganese dioxide: ACGIH TLV-TWA 0.2 mg(Mn)/m<sup>3</sup>; OSHA PEL (Gen Indu):CL 5 mg(Mn)/m<sup>3</sup>.  
Aluminium: PC-TWA: 3 mg/m<sup>3</sup>; OSHA PEL (Gen Indu): 8H TWA 15 mg(Al)/m<sup>3</sup>, total dust;  
ACGIH TLV-TWA: 10 mg(Al)/m<sup>3</sup> (metal dust).
- 8.2. Engineering control: Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location. Use explosion-proof electrical / ventilating / lighting / equipment. Set up emergency exit and necessary risk-elimination area.

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- 8.3. Respiratory protection: If the batteries leak, must try to keep the air circulation, avoid operating in a narrow place. In the normal use conditions of use respiratory protective equipment is not necessary. Respiratory protection may be required under exceptional circumstances when excessive air contamination exists.
- 8.4. Eye protection: Not necessary under normal use conditions, if the battery is damaged or leaking. Wear goggles/safety glasses giving complete eye protection.
- 8.5. Skin and body protection: Not necessary under normal use conditions, if the battery is damaged or leaking wear appropriate clothing to minimize skin exposure.
- 8.6. Hand protection: Not necessary under normal use conditions, if the battery is damaged or leaking wear appropriate protective gloves.
- 8.7. Other protection: Do not eat, drink or smoke in the workplace. Shower and change clothes after work. Observe the common precautionary measures, contaminated clothes must be changed immediately. Wash hands after work is completed.

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## Section 9 - Physical and Chemical Properties

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Appearance: Battery state under normal temp: Solid	pH value (Specify the concentration): No data
Color: N/A	Odor: N/A
Solubility: Insoluble in water.	Flammability: Non flammability
Melting point: No data	Explosion: Not explode

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## Section 10 - Stability and Reactivity

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- 10.1. Stability: Stable under normal conditions of use, storage and transport.
- 10.2. Reactivity: Under the condition of burning may produce harmful breakdown products.
- 10.3. Incompatible materials: Strong oxidizing agents.
- 10.4. Conditions to avoid: In contrast to the nature of the material, overheating, exposed to damp air or water, mechanical vibration and power abuse.
- 10.5. Hazardous decomposition products: Hazardous decomposition products formed under the condition of burning .  
- Metal oxide, or smoke etc.

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## Section 11 - Toxicological Information

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- 11.1. Acute toxicity: Manganese dioxide: LD50 Oral - rat - > 3478mg/kg;  
1,2-dimethoxyethane: LD50 Oral - rat - 1000mg/kg, LD50 Oral – mouse -3200mg/kg.
- 11.2. Skin corrosion/irritation: Lithium: Skin corrosion / irritation, Category 1B.
- 11.3. Eye corrosion/irritation: Lithium: Eye damage / eye irritation (Category 1);  
Propylene carbonate: Eye damage / eye irritation (Category 2A).
- 11.4. Respiratory or skin sensitization: According to the existing data, the product is not classified.
- 11.5. Germ cell mutagenicity: According to the existing data, the product is not classified.
- 11.6. Carcinogenicity: According to ACGIH, IARC, NTP is not listed as a carcinogen.
- 11.7. Reproductive toxicity: 1,2-dimethoxyethane: Reproductive toxicity (Category 1B).
- 11.8. Specific target organ toxicity –single exposure: According to the existing data, the product is not classified.
- 11.9. Specific target organ toxicity - repeated exposure: According to the existing data, the product is not classified.
- 11.10. Aspiration hazard: According to the existing data, the product is not classified.

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## Section 12 - Ecological Information

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- 12.1. Ecotoxicity values: Aluminium: Toxicity to fish LC50 - Oncorhynchus mykiss (rainbow trout) – 0.12 mg/l - 96 h mortality LOEC - Ctenopharyngodon idella - 0,1 mg/l - 96h
- 12.2. Persistence and degradability: No further relevant information available.
- 12.3. Bioaccumulative potential: Aluminium: Bioaccumulation Salvelinus fontinalis-56d-268 µg/l Bioconcentration factor (BCF): 36
- 12.4. Mobility in soil: No further relevant information available.
- 12.5. Other adverse effects: Composition: Aluminum- Very toxic to aquatic life.

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## Section 13 - Disposal Considerations

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- 13.1. Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Consult state, local or national regulations for proper disposal. The generation of waste should be avoided or minimized wherever possible. Contaminated packaging material should be treated equivalent to residual chemical. Clean packaging material should be subjected to waste management schemes (recovery recycling,

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reuse) according to local legislation. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Refer to Section 7-Handling and Storage and Section 8-Exposure Controls/Personal Protection for additional handling information and protection of employees.

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## Section 14 - Transport Information

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UN number	3090&3091
UN Proper shipping name	Lithium Metal Batteries(including Lithium Primary Batteries) or; Lithium Metal Batteries Contained In Equipment(including Lithium Primary Batteries) or; Lithium Metal Batteries Packed With Equip(including Lithium Primary Batteries)
Transport hazard class(es)	IMDG: 9; IATA: 9; ADR/RID: 9;  Depending on their lithium metal content, some single cells and small multi-cell battery packs may be non-assigned to Class 9.
Packing group(if applicable )	-
Marine pollutant(Yes/No)	No
Transport in bulk(according to Annex II of MARPOL 73/78 and the IBC Code)	No information available
Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises	

**Transport information:** The transportation of primary lithium cells and batteries is regulated by the International Air Transport Association (According to Section II/Section 1B of PACKING INSTRUCTION 968, or Section II of PACKING INSTRUCTION 969~970 of IATA DGR 59<sup>th</sup> Edition for transportation), International Civil Aviation Organization, International Maritime Dangerous Goods Code and the US Department of Transportation.

The batteries must meet the following criteria for shipment:

Meet the requirements for the US Department of Transportation listed in 49 CFR 173.185.

The transport of primary lithium batteries is prohibited aboard passenger aircraft.

Refer to the Federal Register December 15, 2004 (Hazardous Materials; Prohibited on the Transportation of Primary



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Lithium Batteries and Cells Aboard Passenger Aircraft; Final Rule) Lithium batteries shipped as may not be classified as “Dangerous Goods” when shipped in accordance with shipped in accordance with “IATA-DGR” or “special 188 of IMO-IMDG Code”.

Per IATA “Lithium Batteries as Cargo in 2017 Update III”; Lithium Metal Batteries and Batteries (UN3090) are forbidden for transport as cargo on a passenger aircraft. All packages must bear the Cargo Aircraft Only label in addition to the other marks and labels required by the Regulations.

Separate batteries when shipping to prevent short-circuiting. They should be packed in strong packaging for support during transport.

More information concerning shipping, testing, marking and packaging can be obtained from label master at <http://labelmaster.com>

**Transport Fashion:** By air, by sea, by railway, by road.

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## Section 15 - Regulatory Information

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### 15.1. Domestic chemical inventory

CAS No.	[1]	[2]	[3]	[4]	[5]	[6]
7439-93-2	Listed	Not listed	Listed	Not listed	Not listed	Not listed
7782-42-5	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
1313-13-9	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
7429-90-5	Listed	Not listed	Listed	Not listed	Not listed	Not listed
108-32-7	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
7791-03-9	Listed	Not listed	Listed	Not listed	Not listed	Not listed
110-71-4	Listed	Not listed	Not listed	Not listed	Not listed	Not listed

[1] 《Catalog of Hazardous Chemicals(2015 Edition)》

[2] 《Highly toxic chemicals directory》

[3] 《Dangerous chemicals directory used to manufacture exploder》

[4] 《National dangerous wastes directory》 annex A

[5] 《Strict limits on the import and export of toxic chemicals directory in China》

[6] 《List of Import and Export of Controlled ODS in China》

### 15.2. International chemical inventory

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CAS No.	TSCA	EINECS	DSL	IECSC	NZIoC	PICCS	KECI	AICS
7439-93-2	Listed	Listed	Listed	Listed	Listed	Listed	Listed	Listed
7782-42-5	Listed	Listed	Listed	Listed	Listed	Listed	Listed	Listed
1313-13-9	Listed	Listed	Listed	Listed	Listed	Listed	Listed	Listed
7429-90-5	Listed	Listed	Listed	Listed	Listed	Listed	Listed	Listed
108-32-7	Listed	Listed	Listed	Listed	Listed	Listed	Listed	Listed
7791-03-9	Listed	Listed	Listed	Listed	Listed	Not listed	Not listed	Listed
110-71-4	Listed	Listed	Listed	Listed	Listed	Listed	Listed	Listed

TSCA: United States Toxic Substances Control Act Inventory

EINECS: European Inventory of Existing Commercial Chemical Substances

DSL: Canadian Domestic Substances List

IECSC: China Inventory of Existing Chemical Substances

PICCS: Philippines Inventory of Chemicals and Chemical Substances

NZIoC: New Zealand Inventory of Chemicals

KECI: Existing and Evaluated Chemical Substances

AICS: List of existing chemical substances in Australia

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## Section 16 - Other Information

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16.1. Legal disclaimer: The above information is believed to be correct but we can not guarantee the absolute universality and accuracy and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. The above-named supplier and its affiliates shall not be held liable for any damage resulting from handling or from contact with the above product.