

1. Identification of the substance/preparation and of the company / undertaking

Product name: Lithium Primary Battery
Product Designation: Manganese Dioxide / All CR Type Cylindrical and Coin Button Primary Batteries
Nominal Voltage: 3.0V
Chemical system: Lithium/ Manganese Dioxide
Designed for recharge: Yes No /
Company name: Power-Xtra Groupe Limited Battery Co., Ltd.
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2. Hazards identifications

Batteries are articles and therefore exempted from the UN-GHS classification requirements. There are no GHS labelling requirements for articles. Other labelling requirements apply for batteries according to the EU Directive 2006/66 for batteries.

Nevertheless, the following warning must be observed: keep out of reach of children.
The chemicals mentioned in Section III are contained in a sealed can. Risk of exposure occurs only if the cell / battery is mechanically or electrically abused. Swallowing of a battery can lead to chemical burns, perforation of soft tissues and death. Severe burns can occur within 2 hours of ingestion. In case of ingestion, seek medical attention immediately

3. Compositions /Information on Ingredients

Chemical Nature: Lithium/ Manganese dioxide batteries

Material	Identification code (CAS)	% (w/w)
iron	7439-89-6	52%
manganese dioxide	1313-13-9	30%
graphite	7782-42-5	4.60%
polypropylene	9003-07-0	4.40%
propylene carbonate	108-32-7	3%
lithium	7439-93-2	2%
1,2-dimethoxyethane	110-71-4	2%
1,3-dioxolane	646-06-0	1.30%
lithium perchlorate	7791-3-9	0.70%
Mercury (Hg)	7439-97-6	≤0.0005
Lead (Pb)	7439-92-1	≤0.0040
Cadmium (Cd)	7440-43-9	≤0.0020

4. First-aid measures

In case of electrolyte leakage, skin will be itchy when contaminated with electrolyte. In contact with electrolyte can cause server irritation and chemical burns
Inhalation of electrolyte vapors may cause irritation of the upper respiratory tract and lungs.
If electrolyte leakage occurs and makes contact with skin, wash with plenty of water immediately
If electrolyte comes into contact with eyes, wash with copious amounts of water for fifteen (15) minutes, and contact a physician.
If electrolyte vapors are inhaled, provide fresh air and seek medical attention if respiratory irritation

develops. Ventilate the contaminated

5. Fire-fighting measures

Flash Point (Method Used)	Flammable Limits	LEL	UEL	N.A.	N.A.
N.A.	N.A.				

Extinguishing Media: Carbon Dioxide, Dry Chemical or Foam extinguishers. Special Fire Fighting Procedures: N.A.

Unusual Fire and Explosion Hazards

Do not dispose of battery in fire - may cause explosion

Do not short-circuit battery - may cause burns.

In case of fire, it is permissible to use any class of extinguishing medium on these batteries or their packing material. Cool exterior of batteries if exposed to fire to prevent rupture.

Fire fighters should wear self-contained breathing apparatus.

6. Accidental release measures

Person related measures: Wear personal protective equipment adapted to the situation (protection gloves, face protection, breathing protection).

Environment protection measures: In the event of battery rupture, prevent skin contact and collect all released material in a plastic lined container. Bind released ingredients with powder (rock salt, sand). Dispose of according to the local law and rules. Avoid leached substances to penetrate into the earth, canalization or water.

Treatment for cleaning: If battery casing is dismantled, small amounts of electrolyte may leak. Package the battery tightly including ingredients together with lime, sand or rock salt. Then clean with water.

7. Handling and storage

Guideline for safe handling:

- Always follow the warning information on the batteries and in the manuals of devices. Only use the recommended battery types.
- Keep batteries away from children. Keep small cells and batteries which are considered swallowable out of the reach of children.
- For devices to be used by children, the battery casing should be protected against unauthorized access.
- Unpacked batteries shall not lie about in bulk.
- In case of battery change always replace all batteries by new ones of identical type and brand.
- Do not swallow batteries. Swallowing may lead to burns, perforation of soft tissue, and death. Severe burns can occur within 2 h of ingestion. In case of ingestion of a cell or battery, seek medical assistance promptly.
- Do not throw batteries into water.
- Do not throw batteries into fire.
- Avoid deep discharge.
- Do not short-circuit batteries.
- Do not recharge primary batteries.
- Do not open or disassemble batteries.

Supply to private end users:

In case the products are supplied to private end users packed with equipment or contained in equipment it is strongly recommended to follow UL product and instruction manual requirements. The product is required to be marked with a graphical symbol that alerts the user to refer to the instruction manual. The instruction manual itself is required to contain

- a warning marking with text to alert the user of the potential chemical burn hazard associated with coin/button battery ingestion,
- an instruction as to the presence of a coin/button cell battery,
- possible effects of battery ingestion,
- an instruction to keep batteries away from children,
- an advice to seek immediate medical attention if it suspected that batteries have either been swallowed or placed inside any part of the body.

Further advice for parents:

<http://buttonbatterysafety.com>

<http://www.productsafety.gov.au/news/the-battery-controlled-button-battery-safety>

Storage:

Storage preferably at room temperature (approx. 20 °C). Avoid large temperature changes. Do not store close to heating devices. Avoid direct sunlight. At higher temperature the electrical performance may be reduced. Storage of unpacked batteries can cause short circuit and heat generation.

Storage category according to TRGS 510:

It is recommended to consider the “Technical Rule for Hazardous Substances TRGS 510 - Storage of hazardous substances in nonstationary containers” and to handle lithium primary cells and batteries according to storage category 11 (“combustible solids”).

Storage of large amounts:

Follow the recommendations of the German Insurance Association (GDV - “Gesamtverband der Deutschen Versicherungswirtschaft e.V.”) concerning lithium batteries:

https://vds.de/fileadmin/vds/publikationen/vds_3103en_web.pdf

In case of storage of large amounts (used storage volume > 7 m³ and/or more than 6 pallets) batteries shall be stored in fire-resistant or separated rooms or areas (e.g. warehouse or container for hazardous materials). Mixed storage with other products is not allowed. The storage area shall be monitored by an automatic fire detection system, connected to a permanently manned place. A fire-extinguishing system shall reflect the extinguishing agents mentioned in section 5.

8. Exposure controls/personal protection

Under normal conditions (discharge) release of ingredients does not occur. Avoid prolonged deep discharge.

9. Physical and chemical properties

Not applicable if closed.

10. Stability and reactivity

Dangerous reactions: When heated above 100 °C the risk of rupture occurs.

11. Toxicological information

Under normal conditions (during discharge) release of ingredients does not occur. In case of accidental release see information

in sections 2 to 4 and 6.

Swallowing of a battery can be harmful. Call the local Poison Control Centre for advice and follow-up. See section 4

12. Ecological information

Power-Xtra primary Lithium button cell do not contain heavy metals as defined by the European directives 2006/66/EC Article 21; they comply with the chemical composition requirements of this Directive. Mercury has not been “intentionally introduced (as distinguished from mercury that may be incidentally present in other materials)” in the sense of the U.S.A. “Mercury-Containing and Rechargeable Battery Management Act” (May 13 1996). The Regulation on Mercury Content Limitation for Batteries promulgated on 1997-12-31 by the China authorities including the State Administration of Light Industry and the State Environmental Protection Administration defines “low mercury” as “mercury content by weight in battery as less than 0.025 %”, and “mercury free” as “mercury content by weight in battery as less than 0.0001 %”. And therefore: Power-Xtra Primary Lithium button cell belong to the category of mercury-free battery (mercury content lower than 0.0001 %).

13. Disposal considerations

In order to avoid short circuit and heating, used Power-Xtra primary Lithium button cell should never be stored or transported in bulk. Proper measures against short circuit are:

- Storage of batteries in original packaging
- Coverage of the terminals
- Embedding in dry sand

European Union

In the European Union, manufacturing, handling and disposal of batteries is regulated on the basis of the DIRECTIVE 2006/66/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC. Customers find detailed information on disposal in their specific countries using the web site of the European Portable Batteries Association (www.epbaeurope.net/legislation-national.html).

Importers and users outside EU should consider the local law and rules.

USA

Power-Xtra primary Lithium button cell are classified by the federal government as non-hazardous waste and are safe for disposal in the normal municipal waste stream. These batteries, however, do contain recyclable materials and are accepted for recycling by Call2Recycle, Inc. Please go to their website at www.call2recycle.org for additional information.

14. Transport information

General considerations

Power-Xtra primary Lithium button cell are considered to be UN 3090 Lithium Metal Batteries and are tested according to subsection 38.3 of the "UN Manual of Tests and Criteria" for compliance with the requirements of special provisions ADR 188, IMDG 188, as well as the requirements of DOT / 49 CFR § 173.185, and the requirements of IATA DGR packing instruction 968.

Test results as well as other relevant information required for transportation are given in dedicated "Supplier's Test Summaries".

Transportations of cells or batteries packed with equipment or contained in equipment have to follow the appropriate regulations for UN 3091.

During the transportation of large amounts of batteries by ship, trailer or railway, do not store them in places of high temperature and do not allow them to be exposed to condensation. During the transportation do not allow the packaging to be damaged, as a damage of the packaging may cause fire. In the event packaging is damaged, special procedures must be used including inspection and repackaging if necessary and handle with care.

Compilations of transport requirements for Lithium batteries can be found in:

<https://www.lithium-batterie-service.de/en/>

<https://www.iata.org/whatwedo/cargo/dgr/Documents/lithium-battery-shipping-guidelines.pdf>

Each cell or battery is manufactured under a quality management program according to IATA DGR clause 3.9.2.6, ADR clause 2.2.9.1.7 e), and IMDG code clause 2.9.4.5.

IEC 60086-1

Code of practice for packaging and shipment of primary batteries given in IEC 60086-1:

"The packaging shall be adequate to avoid mechanical damage during transport, handling and stacking. The materials and pack design shall be chosen so as to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of moisture."

"Shock and vibration shall be kept to a minimum. For instance, boxes should not be thrown off trucks, slammed into position or piled so high as to overload battery containers below. Protection from inclement weather should be provided."

All Power-Xtra lithium batteries are not subject to the requirements of the Department of Transportation (DOT) Subchapter C, Hazardous Materials Regulations if shipped in compliance with 49 CFR 173.185.

Effective January 1, 2019 all Power-Xtra lithium batteries can be shipped by air in accordance with International Civil Aviation Organization (ICAO), 2019-2020 edition, Section II or Section 1B or International Air Transport Association (IATA) 60th edition, Section II or Section 1B Packing Instructions (PI) 968 (Batteries), PI 969 (Batteries, packed with equipment) and PI 970 (Batteries, contained in equipment) as appropriate

All Power-Xtra lithium batteries are regulated by the International Maritime Organization (IMO), 2018, 39th amendment, under Special Provisions 188 and 230.

All Power-Xtra lithium cells are tested and comply with the UN Model Regulations, Manual of Test and Criteria, Part III, subsection 38.3.

If you build any of our lithium cells into a battery pack, you must also assure that they are tested in accordance with the UN Model Regulations, Manual of Test and Criteria. Part III, subsection 38.3, 6th Revised Edition, Amendment 1.

If you plan on transporting any untested prototype battery packs contact your Power-Xtra Sales Representative for regulatory information. Check with your air carrier before shipping. Many air carriers have additional requirements.

Shipping Name (UN Number) lithium metal batteries(UN3090)
 lithium metal batteries packed with equipment(UN3091)
 lithium metal batteries contained in equipment(UN3091)

Hazard Classification class 9 (Miscellaneous)

Organizations governing the transport of lithium batteries

Area	Method	Organization	Special Provision
International	Air	IATA,ICAO	Packing instruction 968 section II
International	Marine	IMO	SP188
U.S.A	Air, Rail, Road, Marine	DOT	49 CFR Section 173.185

Their regulations are based on the UN Recommendations. Each special provision provides specifications on exceptions and packaging for lithium metal batteries shipping. The products can be transported as "Non Dangerous Goods" when they meet the requirements of packing instruction 968 Section II of IATA-DGR(58th Edition)or SP188 of IMDG Code (Amdt. 37-14) 2014 Edition.

15. Regulatory information

Marking consideration

European Union: According to "DIRECTIVE 2006/66/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC" the batteries have to be marked with the crossed bin.

For the state of California these batteries have to be marked as "containing perchlorate".

International safety standards

For UL recognition of the basis cells according to UL 1642 see: BBCV2.MH13654

Steps to Be Taken in Case Material is Released or Spilled Batteries that are leakage should be handled with rubber gloves. Avoid direct contact with electrolyte.
Wear protective clothing and a positive pressure Self-Contained Breathing Apparatus (SCBA).

16. Other information

The data in this Material Safety Data Sheet relates only to the specific material designated herein.