

Coin type Lithium Manganese Dioxide Batteries(CR) 3V

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations (According to HCS-2012 APPENDIX D TO §1910.1200)

Issue date: 12/08/2020

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SECTION 1: Identification

1.1. Identification

Product form : Article
Trade name : Coin type Lithium Manganese Dioxide Batteries(CR) 3V
Sample model : CR2032/ CR2025/ CR2016/ CR2430/ CR2450/ CR2477/
CR1220/ CR927/ CR2012/ CR1632/ CR1620/ CR1616
Rating : Nominal Voltage: 3V

1.2. Recommended use and restrictions on use

Recommended use : Power supply
Restrictions on use : No information available

1.3. Supplier

Manufacturer: ZhongShan Sunrise Electronics Co., Ltd
Address: No.7, DaMei Road GangKou Town ZhongShan City
Factory: ZhongShan Sunrise Electronics Co., Ltd
Address: No.7, DaMei Road GangKou Town ZhongShan City
Telephone no: 0760-88409128
Fax: 0760-88481819
E-mail: sunrise@greatcell.com.cn

1.4. Emergency telephone number

Emergency number : 86-760-88409128

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS US classification

Not classified

2.2. GHS Label elements, including precautionary statements

GHS US labelling

No labelling applicable

2.3. Other hazards which do not result in classification

Routes of entry

1. Eyes and Skin—When leaking, the electrolyte solution contained in the battery irritates to ocular tissues and the skin.
2. Inhalation—Respiratory (and eye) irritation may occur if fumes are released due heat or an abundance of leaking batteries.
3. Ingestion—The ingestion of the battery can be harmful. Content of open battery can cause serious chemical burns of mouth, esophagus and gastrointestinal tract.

Health harm

Exposure to leaking electrolyte from ruptured or leaking battery can cause:

1. Inhalation—Burns and irritation of the respiratory system, coughing, wheezing, and shortness of breath.
2. Eyes—Redness, tearing, burns. The electrolyte is corrosive to all ocular tissues.
3. Skin—The electrolyte is corrosive and causes skin irritation and burns.
4. Ingestion—The electrolyte solution causes tissue damage to throat and gastrointestinal track.

Explosion danger

The battery may be explosive at high temperature (above 150°C) or exposing to the fire.

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2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	Product identifier	%
Manganese oxide (MnO ₂)	(CAS-No.) 1313-13-9	30 – 40
Iron	(CAS-No.) 7439-89-6	25 – 30
Ethylene glycol dimethyl ether	(CAS-No.) 110-71-4	11 – 15
Perchloric acid, lithium salt	(CAS-No.) 7791-03-9	
Propylene carbonate	(CAS-No.) 108-32-7	
Chromium	(CAS-No.) 7440-47-3	8 – 10
Graphite	(CAS-No.) 7782-42-5	3 – 4
Lithium	(CAS-No.) 7439-93-2	2 – 3
Polypropylene	(CAS-No.) 9003-07-0	2

Full text of hazard classes and H-statements : see section 16

SECTION 4: First-aid measures

4.1. Description of first aid measures

- First-aid measures general : If symptoms persist, call a physician.
- First-aid measures after inhalation : Not anticipated. If the battery is leaking, remove to fresh air. If irritation persists, consult a physician.
- First-aid measures after skin contact : Not anticipated. If the battery is leaking and the contained material contacts the skin, flush with copious amounts of clear water for at least 15 minutes.
- First-aid measures after eye contact : Not anticipated. If the battery is leaking and the contained material contacts eyes, flush with copious amounts of clear water for at least 15 minutes. Get medical attention at once.
- First-aid measures after ingestion : Not anticipated. If the battery is leaking and the contained material is ingested, rinse mouth and surrounding area with clear water at once. Consult a physician immediately for treatment.

4.2. Most important symptoms and effects (acute and delayed)

No information available.

4.3. Immediate medical attention and special treatment, if necessary

Treat symptomatically.

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

- Suitable extinguishing media : Dry chemical type extinguishers are the most effective means to extinguish a battery fire. A CO₂ extinguisher will also work effectively.
- Unsuitable extinguishing media : No information available.

5.2. Specific hazards arising from the chemical

- Unusual Fire and Explosion Hazards : Battery may explode or leak potentially hazardous vapors subject to: exposed to excessive heat (above the maximum rated temperature as specified by the manufacturer) or fire, charged, short circuit, punctured and crushed.
- Hazardous decomposition products in case of fire : Toxic fumes may be released. Fire, excessive heat, or over voltage conditions may produce hazardous decomposition products. Damaged batteries can result in rapid heating and the release of flammable vapors.

5.3. Special protective equipment and precautions for fire-fighters

- Protection during firefighting : Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing. During water application, caution is advised as burning pieces of flammable particles may be ejected from the fire.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

- Emergency procedures : Ventilate spillage area.

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6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Pick up mechanically. The material contained within the battery would only be released under abusive conditions. In the event of battery rupture and leakage, collect all the released materials that are not hot or burning in an appropriate waste disposal container while wearing proper protective clothing and ventilate the area. Placed in approved container and disposed according to the local regulations.

Other information : Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Ensure good ventilation of the work station. Wear personal protective equipment.
Batteries are designed to be non-recharged.
Never disassemble or modify a battery.
Do not immerse, throw, and wet a battery in water.
Should a battery unintentionally be crushed, thus releasing its contents, rubber gloves must be used to handle all battery components. Avoid the inhalation of any vapors that may be emitted.
Short circuit causes heating. In addition, short circuit reduces the life of the battery and can lead to ignition of surrounding materials. Physical contact with to short-circuited battery can cause skin burn.
Avoid reversing the battery polarity, which can cause the battery to be damaged or flame.
In the event of skin or eye exposure to the electrolyte, refer to Section 4, First Aid Measures.

Hygiene measures : Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a well-ventilated place. Keep cool.
Batteries should be separated from other materials and stored in a noncombustible, well ventilated, sprinkler-protected structure with sufficient clearance between walls and battery stacks. Do not place batteries near heating equipment, nor expose to direct sunlight for long periods.
Do not store batteries above 35°C or below -20°C. Store batteries in a cool (about 20°C±5°C) in a long time, dry and ventilated area that is subject to little temperature change. Elevated temperatures can result in reduced battery cycle life. Battery exposure to temperatures in excess of 60°C will result in the battery venting flammable liquid and gases. Keep batteries in original package until use and do not jumble them.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

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No additional information available
Lithium (7439-93-2)
No additional information available
Manganese oxide (MnO₂) (1313-13-9)
No additional information available
Polypropylene (9003-07-0)
No additional information available

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Graphite (7782-42-5)	
USA - ACGIH - Occupational Exposure Limits	
ACGIH TWA (mg/m³)	2 mg/m³ (all forms except graphite fibers-respirable particulate matter)
USA - OSHA - Occupational Exposure Limits	
OSHA PEL (TWA) (mg/m³)	15 mg/m³ (synthetic-total dust) 5 mg/m³ (synthetic-respirable fraction)
USA - IDLH - Occupational Exposure Limits	
US IDLH (mg/m³)	1250 mg/m³
USA - NIOSH - Occupational Exposure Limits	
NIOSH REL (TWA) (mg/m³)	2.5 mg/m³ (natural-respirable dust)
Chromium (7440-47-3)	
USA - ACGIH - Occupational Exposure Limits	
ACGIH TWA (mg/m³)	0.5 mg/m³ (inhalable particulate matter)
USA - OSHA - Occupational Exposure Limits	
OSHA PEL (TWA) (mg/m³)	1 mg/m³
USA - IDLH - Occupational Exposure Limits	
US IDLH (mg/m³)	250 mg/m³
USA - NIOSH - Occupational Exposure Limits	
NIOSH REL (TWA) (mg/m³)	0.5 mg/m³
Iron (7439-89-6)	
No additional information available	
Perchloric acid, lithium salt (7791-03-9)	
No additional information available	
Ethylene glycol dimethyl ether (110-71-4)	
No additional information available	
Propylene carbonate (108-32-7)	
No additional information available	

8.2. Appropriate engineering controls

Appropriate engineering controls : Ensure good ventilation of the work station.
Environmental exposure controls : Avoid release to the environment.

8.3. Individual protection measures/Personal protective equipment

Hand protection:

Not necessary under conditions of normal use. Use chemical resistant rubber gloves if handling a leaking or ruptured battery

Eye protection:

Not necessary under conditions of normal use. Use safety glasses with side shields if handling a leaking or ruptured battery.

Skin and body protection:

Not necessary under conditions of normal use. Use rubber apron and protective working in case of handling a leaking or ruptured battery.

Respiratory protection:

Not necessary under conditions of normal use. If battery is burning, leave the area immediately. During fire fighting fireman should use self-contained breathing, full-face respiratory equipment. Fires may be fought but only from safe fire fighting distance, evacuate all persons from the area of fire immediately.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Solid
Colour : No data available
Odour : No data available
Odour threshold : No data available
pH : No data available

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Melting point	: No data available
Freezing point	: No data available
Boiling point	: No data available
Flash point	: No data available
Relative evaporation rate (butylacetate=1)	: No data available
Flammability (solid, gas)	: No data available
Vapour pressure	: No data available
Relative vapour density at 20 °C	: No data available
Relative density	: No data available
Solubility	: Insoluble in water.
Partition coefficient n-octanol/water (Log Pow)	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive limits	: No data available
Explosive properties	: No data available
Oxidising properties	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

Hazardous Polymerization: will not occur.

10.4. Conditions to avoid

Do not charge, heat, throw into fire, disassemble, short circuit, immerse in water, etc.

Avoid exposure heat, open flame and corrosives.

10.5. Incompatible materials

No information available.

10.6. Hazardous decomposition products

The battery may release irritative gas once the electrolyte leakage.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

The battery does not elicit toxicological properties during routine handling and use. If the battery is opened through misuse or damage, discard immediately. Internal components of cell are irritant and sensitization.

Acute toxicity (oral) : Not classified

Acute toxicity (dermal) : Not classified

Acute toxicity (inhalation) : Not classified

Manganese oxide (MnO ₂) (1313-13-9)	
LD50 oral rat	9000 mg/kg
ATE US (oral)	9000 mg/kg bodyweight
Graphite (7782-42-5)	
LD50 oral rat	> 2000 mg/kg OECD 423, CSR
LC50 Inhalation - Rat	> 2000 mg/l/4h OECD 403, CSR

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Chromium (7440-47-3)	
LD50 oral rat	> 5000 mg/kg bodyweight
LC50 Inhalation - Rat	> 5.41 mg/l/4h

Iron (7439-89-6)	
LD50 oral rat	30 g/kg
ATE US (oral)	30000 mg/kg bodyweight

Ethylene glycol dimethyl ether (110-71-4)	
LD50 oral rat	> 4000 mg/kg
LD50 dermal rabbit	1000 – 2000 mg/kg
LC50 Inhalation - Rat	20 – 63 mg/l (Exposure time: 6 h)

Propylene carbonate (108-32-7)	
LD50 oral rat	29000 mg/kg
LD50 dermal rabbit	> 3000 mg/kg

Skin corrosion/irritation	: Not classified Prolonged contact with the skin or mucous membranes may cause irritation.
Serious eye damage/irritation	: Not classified The electrolytes contained in this battery can irritate eyes with any contact.
Respiratory or skin sensitisation	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified

Polypropylene (9003-07-0)	
IARC group	3 - Not classifiable

Chromium (7440-47-3)	
IARC group	3 - Not classifiable

Reproductive toxicity	: Not classified
STOT-single exposure	: Not classified
STOT-repeated exposure	: Not classified
Aspiration hazard	: Not classified
Viscosity, kinematic	: No data available

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general	: The product is not considered harmful to aquatic organisms nor to cause long-term adverse effects in the environment.
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Graphite (7782-42-5)	
LC50 fish 1	> 100 mg/l Danio rerio, OECD 203, CSR
EC50 Daphnia 1	> 100 mg/l Daphnia magna, OECD 202, CSR

Propylene carbonate (108-32-7)	
LC50 fish 1	> 1000 mg/l (Exposure time: 96 h - Species: Cyprinus carpio [semi-static])
EC50 Daphnia 1	> 500 mg/l (Exposure time: 48 h - Species: Daphnia magna)

12.2. Persistence and degradability

No additional information available

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12.3. Bioaccumulative potential

Manganese oxide (MnO ₂) (1313-13-9)	
BCF fish 1	(no bioaccumulation expected)
Partition coefficient n-octanol/water (Log Pow)	< 0 (at 20 °C)

Propylene carbonate (108-32-7)	
Partition coefficient n-octanol/water (Log Pow)	0.48 (at 25 °C)

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

Do not let internal components enter marine environment. Avoid releasing to water ways, wastewater or ground water

SECTION 13: Disposal considerations

13.1. Disposal methods

Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions.

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

Transport document description : UN3090 Lithium battery, 9
UN-No.(DOT) : UN3090
Proper Shipping Name (DOT) : Lithium battery
Class (DOT) : 9 - Class 9 - Miscellaneous hazardous material 49 CFR 173.140
Hazard labels (DOT) : 9 - Class 9 (Miscellaneous dangerous materials)



DOT Packaging Non Bulk (49 CFR 173.xxx) : 185
DOT Packaging Bulk (49 CFR 173.xxx) : 185
DOT Special Provisions (49 CFR 172.102) : 422 - When labelling is required, the label to be used must be the label shown in §172.447. Labels conforming to requirements in place on December 31, 2016 may continue to be used until December 31, 2018. When a placard is displayed, the placard must be the placard shown in §172.560.
A54 - Lithium batteries or lithium batteries contained or packed with equipment that exceed the maximum gross weight allowed by Column (9B) of the 172.101 Table may only be transported on cargo aircraft if approved by the Associate Administrator.
DOT Packaging Exceptions (49 CFR 173.xxx) : 185
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : Forbidden
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 35 kg
DOT Vessel Stowage Location : A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel.
Emergency Response Guide (ERG) Number : 138
Other information : No supplementary information available.

Transportation of Dangerous Goods

Transport document description : UN3090 LITHIUM METAL BATTERIES, 9
UN-No. (TDG) : UN3090
Proper Shipping Name (Transportation of Dangerous Goods) : LITHIUM METAL BATTERIES

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TDG Primary Hazard Classes	: 9 - Class 9 - Miscellaneous Products, Substances or Organisms
TDG Special Provisions	: 34 - (1) These Regulations, except for Part 1 (Coming into Force, Repeal, Interpretation, General Provisions and Special Cases) and Part 2 (Classification), do not apply to the handling, offering for transport or transporting of lithium cells and batteries on a road vehicle, a railway vehicle or a vessel on a domestic voyage if (a) for a lithium metal or lithium alloy cell, the lithium content is not more than 1 g, and, for a lithium-ion cell, the watt-hour rating is not more than 20 Wh; (b) for a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g, and for a lithium-ion battery, the watt-hour rating is not more than 100 Wh; (c) lithium ion batteries are marked with the watt-hour rating on the outside case, except for those manufactured before January 1, 2009; (d) each cell and battery type passes each of the tests set out in paragraph 2.43.1(2)(a) of Part 2 (Classification); (e) the cells and batteries are afforded protection against short circuit, including protection against contact with conductive materials within the same packaging that could lead to a short circuit; (f) the cells and batteries are packed in a means of containment that completely encloses the cells and batteries; (g) the gross mass of the cells and batteries does not exceed 30 kg, except when the cells and batteries are installed in or packed with equipment; and (h) the cells and batteries are packed in a means of containment capable of withstanding a 1.2 m drop test in any orientation without damage to the cells or batteries contained inside the means of containment, without the contents shifting so as to allow battery-to-battery or cell-to-cell, contact, and without release of contents. (2) Cells and batteries referred to in subsection (1) that are installed in equipment must, unless they are afforded equivalent protection by the equipment in which they are contained, (a) be afforded protection against damage and short circuit, including protection against contact with conductive materials within the same packaging that could lead to a short circuit; (b) subject to subsection (3), be fitted to prevent accidental activation; and (c) be packed in a means of containment designed, constructed, filled, closed, secured and maintained so that under normal conditions of transport, including handling, there will be no release of the dangerous goods that could endanger public safety. (3) Paragraph (2)(b) does not apply to cells and batteries installed in devices that are intentionally active during transport such as radio frequency identification transmitters, watches and sensors, and that are not capable of generating a dangerous evolution of heat. (4) Except for means of containment containing button cell batteries installed in equipment, including circuit boards, or no more than four cells installed in equipment or no more than two batteries installed in equipment, each means of containment must be marked with the appropriate lithium battery mark in accordance with section 4.24. (5) Despite subsection (4), except for means of containment containing button cell batteries installed in equipment, including circuit boards, or no more than four cells installed in equipment or no more than two batteries installed in equipment, each means of containment may, until December 31, 2018, be marked with the following: (a) "lithium metal", "lithium métal", "lithium ion" or "lithium ionique", as appropriate; (b) an indication that the means of containment must be handled with care and that a flammability hazard exists if the means of containment is damaged; (c) an indication that special procedures must be followed in the event the means of containment is damaged, including inspection and repacking, if necessary; and (d) a telephone number to call for additional information, 123 - (1) The testing requirements in subsection 38.3 of Part III of the Manual of Tests and Criteria do not apply to production runs consisting of not more than 100 cells and batteries or to pre-production prototypes of cells and batteries that are transported on a road vehicle, a railway vehicle or a vessel on a domestic voyage if (a) the cells or batteries are imported, offered for transport, handled or transported in accordance with Packing Instruction P910 of the UN Recommendations; and (b) the pre-production prototypes of cells and batteries are in transport for the purpose of testing. (2) Despite paragraph (1)(b), batteries that have a total mass of 12 kg or more and that have a strong, impact-resistant outer casing, or assemblies of them, may be packed in an outer means of containment or protective enclosure designed, constructed, filled, closed, secured and maintained so that under normal conditions of transport, including handling, there will be no release of the dangerous goods that could endanger public safety. The batteries or battery assemblies must be protected from short-circuit, 137 - (1) This shipping name applies to lithium ion cells or batteries, and lithium metal cells or batteries, that are damaged or defective and do not conform to subsection 2.43.1(2) of Part 2 (Classification). (2) Lithium ion cells or batteries and lithium metal cells or batteries that are damaged or defective, include, but are not limited to, cells or batteries that have leaked or vented, or have sustained physical or mechanical damage, and cannot be diagnosed prior to transport, or that have been identified as being defective for safety reasons. (3) Lithium ion cells or batteries and lithium metal cells or batteries that are damaged or

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defective must be packed in accordance with Packing Instructions P908 or LP904 of the UN Recommendations, as applicable.

(4) As applicable, the outer means of containment or the overpack must be marked legibly and visibly on a contrasting background, with the words "Damaged/Defective Lithium Ion Batteries", "piles au lithium ionique endommagées/défectueuses", "Damaged/Defective Lithium Metal Batteries" or "piles au lithium métal endommagées/défectueuses".

(5) It is forbidden to transport lithium ion cells or batteries and lithium metal cells or batteries that are damaged or defective and that, under normal conditions of transport, are liable to disassemble rapidly, react dangerously, produce a flame or a dangerous evolution of heat, or produce a dangerous emission of toxic, corrosive or flammable gases or vapours.

(6) It is forbidden to transport by aircraft lithium ion cells or batteries and lithium metal cells or batteries that are damaged or defective, 138 - (1) When transported for disposal or recycling, lithium ion cells or batteries and lithium metal cells or batteries, or equipment containing those cells or batteries,

(a) are not subject to subsection 2.43.1(2) of Part 2 (Classification);

(b) must be packed in accordance with Packing Instructions P909 or LP904 of the UN Recommendations, as applicable, whether packed with or without non-lithium cells or batteries or equipment containing those cells or batteries;

(c) must be in a means of containment or an overpack that is marked legibly and visibly on a contrasting background with the words "Lithium batteries for disposal", "Piles au lithium destinées à l'élimination", "Lithium batteries for recycling" or "Piles au lithium destinées au recyclage", as appropriate; and

(d) are forbidden for transport by aircraft.

(2) Damaged or defective cells and batteries must be offered for transport or transported under special provision 137, 149 - These dangerous goods are forbidden for transport as cargo on a passenger aircraft, 159 - (1) Subject to subsection (2), the label to be used for these dangerous goods is the one illustrated under the heading for lithium batteries "Class 9, Lithium Batteries" in the appendix to Part 4 (Dangerous Goods Safety Marks).

(2) The generic Class 9 label may be used until December 31, 2018.

Explosive Limit and Limited Quantity Index : 0
Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index : 5 kg

Transport by sea

Transport document description (IMDG) : UN 3090 LITHIUM METAL BATTERIES, 9
UN-No. (IMDG) : 3090
Proper Shipping Name (IMDG) : LITHIUM METAL BATTERIES
Class (IMDG) : 9 - Miscellaneous dangerous substances and articles
Limited quantities (IMDG) : 0

Air transport

Transport document description (IATA) : UN 3090 Lithium metal batteries, 9A
UN-No. (IATA) : 3090
Proper Shipping Name (IATA) : Lithium metal batteries
Class (IATA) : 9 - Miscellaneous Dangerous Goods

Department of Transportation (DOT)

In accordance with DOT

Transport document description : UN3091 Lithium batteries, contained in equipment, 9
UN-No.(DOT) : UN3091
Proper Shipping Name (DOT) : Lithium batteries, contained in equipment
Class (DOT) : 9 - Class 9 - Miscellaneous hazardous material 49 CFR 173.140
Hazard labels (DOT) : 9 - Class 9 (Miscellaneous dangerous materials)



DOT Packaging Non Bulk (49 CFR 173.xxx) : 185

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DOT Packaging Bulk (49 CFR 173.xxx)	: 185
DOT Special Provisions (49 CFR 172.102)	: 181 - When a package contains a combination of lithium batteries contained in equipment and lithium batteries packed with equipment, the following requirements apply: a. The shipper must ensure that all applicable requirements of §173.185 of this subchapter are met. The total mass of lithium batteries contained in any package must not exceed the quantity limits in columns (9A) and (9B) for passenger aircraft or cargo aircraft, as applicable; b. Except as provided in §173.185(c)(3) of this subchapter, the package must be marked "UN 3091 Lithium metal batteries packed with equipment", or "UN 3481 Lithium ion batteries packed with equipment," as appropriate. If a package contains both lithium metal batteries and lithium ion batteries packed with and contained in equipment, the package must be marked as required for both battery types. However, button cell batteries installed in equipment (including circuit boards) need not be considered; and c. The shipping paper must indicate "UN 3091 Lithium metal batteries packed with equipment" or "UN 3481 Lithium ion batteries packed with equipment," as appropriate. If a package contains both lithium metal batteries and lithium ion batteries packed with and contained in equipment, then the shipping paper must indicate both "UN 3091 Lithium metal batteries packed with equipment" and "UN 3481 Lithium ion batteries packed with equipment." 422 - When labelling is required, the label to be used must be the label shown in §172.447. Labels conforming to requirements in place on December 31, 2016 may continue to be used until December 31, 2018. When a placard is displayed, the placard must be the placard shown in §172.560. A54 - Lithium batteries or lithium batteries contained or packed with equipment that exceed the maximum gross weight allowed by Column (9B) of the 172.101 Table may only be transported on cargo aircraft if approved by the Associate Administrator.
DOT Packaging Exceptions (49 CFR 173.xxx)	: 185
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	: 5 kg
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	: 35 kg
DOT Vessel Stowage Location	: A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel.
Emergency Response Guide (ERG) Number	: 138
Other information	: No supplementary information available.

Transportation of Dangerous Goods

Transport document description	: UN3091 LITHIUM METAL BATTERIES CONTAINED IN EQUIPMENT, 9
UN-No. (TDG)	: UN3091
Proper Shipping Name (Transportation of Dangerous Goods)	: LITHIUM METAL BATTERIES CONTAINED IN EQUIPMENT
TDG Primary Hazard Classes	: 9 - Class 9 - Miscellaneous Products, Substances or Organisms
TDG Special Provisions	: 34 - (1) These Regulations, except for Part 1 (Coming into Force, Repeal, Interpretation, General Provisions and Special Cases) and Part 2 (Classification), do not apply to the handling, offering for transport or transporting of lithium cells and batteries on a road vehicle, a railway vehicle or a vessel on a domestic voyage if (a) for a lithium metal or lithium alloy cell, the lithium content is not more than 1 g, and, for a lithium-ion cell, the watt-hour rating is not more than 20 Wh; (b) for a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g, and for a lithium-ion battery, the watt-hour rating is not more than 100 Wh; (c) lithium ion batteries are marked with the watt-hour rating on the outside case, except for those manufactured before January 1, 2009; (d) each cell and battery type passes each of the tests set out in paragraph 2.43.1(2)(a) of Part 2 (Classification); (e) the cells and batteries are afforded protection against short circuit, including protection against contact with conductive materials within the same packaging that could lead to a short circuit; (f) the cells and batteries are packed in a means of containment that completely encloses the cells and batteries; (g) the gross mass of the cells and batteries does not exceed 30 kg, except when the cells and batteries are installed in or packed with equipment; and (h) the cells and batteries are packed in a means of containment capable of withstanding a 1.2 m drop test in any orientation without damage to the cells or batteries contained inside the means of containment, without the contents shifting so as to allow battery-to-battery or cell-to-cell, contact, and without release of contents. (2) Cells and batteries referred to in subsection (1) that are installed in equipment must, unless they are afforded equivalent protection by the equipment in which they are contained, (a) be afforded protection against damage and short circuit, including protection against contact

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with conductive materials within the same packaging that could lead to a short circuit;

(b) subject to subsection (3), be fitted to prevent accidental activation; and

(c) be packed in a means of containment designed, constructed, filled, closed, secured and maintained so that under normal conditions of transport, including handling, there will be no release of the dangerous goods that could endanger public safety.

(3) Paragraph (2)(b) does not apply to cells and batteries installed in devices that are intentionally active during transport such as radio frequency identification transmitters, watches and sensors, and that are not capable of generating a dangerous evolution of heat.

(4) Except for means of containment containing button cell batteries installed in equipment, including circuit boards, or no more than four cells installed in equipment or no more than two batteries installed in equipment, each means of containment must be marked with the appropriate lithium battery mark in accordance with section 4.24.

(5) Despite subsection (4), except for means of containment containing button cell batteries installed in equipment, including circuit boards, or no more than four cells installed in equipment or no more than two batteries installed in equipment, each means of containment may, until December 31, 2018, be marked with the following:

(a) "lithium metal", "lithium métal", "lithium ion" or "lithium ionique", as appropriate;

(b) an indication that the means of containment must be handled with care and that a flammability hazard exists if the means of containment is damaged;

(c) an indication that special procedures must be followed in the event the means of containment is damaged, including inspection and repacking, if necessary; and

(d) a telephone number to call for additional information, 123 - (1) The testing requirements in subsection 38.3 of Part III of the Manual of Tests and Criteria do not apply to production runs consisting of not more than 100 cells and batteries or to pre-production prototypes of cells and batteries that are transported on a road vehicle, a railway vehicle or a vessel on a domestic voyage if

(a) the cells or batteries are imported, offered for transport, handled or transported in accordance with Packing Instruction P910 of the UN Recommendations; and

(b) the pre-production prototypes of cells and batteries are in transport for the purpose of testing.

(2) Despite paragraph (1)(b), batteries that have a total mass of 12 kg or more and that have a strong, impact-resistant outer casing, or assemblies of them, may be packed in an outer means of containment or protective enclosure designed, constructed, filled, closed, secured and maintained so that under normal conditions of transport, including handling, there will be no release of the dangerous goods that could endanger public safety. The batteries or battery assemblies must be protected from short-circuit, 137 - (1) This shipping name applies to lithium ion cells or batteries, and lithium metal cells or batteries, that are damaged or defective and do not conform to subsection 2.43.1(2) of Part 2 (Classification).

(2) Lithium ion cells or batteries and lithium metal cells or batteries that are damaged or defective, include, but are not limited to, cells or batteries that have leaked or vented, or have sustained physical or mechanical damage, and cannot be diagnosed prior to transport, or that have been identified as being defective for safety reasons.

(3) Lithium ion cells or batteries and lithium metal cells or batteries that are damaged or defective must be packed in accordance with Packing Instructions P908 or LP904 of the UN Recommendations, as applicable.

(4) As applicable, the outer means of containment or the overpack must be marked legibly and visibly on a contrasting background, with the words "Damaged/Defective Lithium Ion Batteries", "piles au lithium ionique endommagées/défectueuses", "Damaged/Defective Lithium Metal Batteries" or "piles au lithium métal endommagées/défectueuses".

(5) It is forbidden to transport lithium ion cells or batteries and lithium metal cells or batteries that are damaged or defective and that, under normal conditions of transport, are liable to disassemble rapidly, react dangerously, produce a flame or a dangerous evolution of heat, or produce a dangerous emission of toxic, corrosive or flammable gases or vapours.

(6) It is forbidden to transport by aircraft lithium ion cells or batteries and lithium metal cells or batteries that are damaged or defective, 138 - (1) When transported for disposal or recycling, lithium ion cells or batteries and lithium metal cells or batteries, or equipment containing those cells or batteries,

(a) are not subject to subsection 2.43.1(2) of Part 2 (Classification);

(b) must be packed in accordance with Packing Instructions P909 or LP904 of the UN Recommendations, as applicable, whether packed with or without non-lithium cells or batteries or equipment containing those cells or batteries;

(c) must be in a means of containment or an overpack that is marked legibly and visibly on a contrasting background with the words "Lithium batteries for disposal", "Piles au lithium destinées à l'élimination", "Lithium batteries for recycling" or "Piles au lithium destinées au recyclage", as appropriate; and

(d) are forbidden for transport by aircraft.

(2) Damaged or defective cells and batteries must be offered for transport or transported under special provision 137, 159 - (1) Subject to subsection (2), the label to be used for these dangerous goods is the one illustrated under the heading for lithium batteries "Class 9, Lithium

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Batteries" in the appendix to Part 4 (Dangerous Goods Safety Marks).
(2) The generic Class 9 label may be used until December 31, 2018.

Explosive Limit and Limited Quantity Index : 0
Passenger Carrying Road Vehicle or Passenger : 5 kg
Carrying Railway Vehicle Index

Transport by sea

Transport document description (IMDG) : UN 3091 LITHIUM METAL BATTERIES CONTAINED IN EQUIPMENT, 9
UN-No. (IMDG) : 3091
Proper Shipping Name (IMDG) : LITHIUM METAL BATTERIES CONTAINED IN EQUIPMENT
Class (IMDG) : 9 - Miscellaneous dangerous substances and articles
Limited quantities (IMDG) : 0

Air transport

Transport document description (IATA) : UN 3091 Lithium metal batteries contained in equipment, 9A
UN-No. (IATA) : 3091
Proper Shipping Name (IATA) : Lithium metal batteries contained in equipment
Class (IATA) : 9 - Miscellaneous Dangerous Goods

Department of Transportation (DOT)

In accordance with DOT

Transport document description : UN3091 Lithium batteries packed with equipment, 9
UN-No.(DOT) : UN3091
Proper Shipping Name (DOT) : Lithium batteries packed with equipment
Class (DOT) : 9 - Class 9 - Miscellaneous hazardous material 49 CFR 173.140
Hazard labels (DOT) : 9 - Class 9 (Miscellaneous dangerous materials)



DOT Packaging Non Bulk (49 CFR 173.xxx) : 185
DOT Packaging Bulk (49 CFR 173.xxx) : 185
DOT Special Provisions (49 CFR 172.102) : 181 - When a package contains a combination of lithium batteries contained in equipment and lithium batteries packed with equipment, the following requirements apply: a. The shipper must ensure that all applicable requirements of §173.185 of this subchapter are met. The total mass of lithium batteries contained in any package must not exceed the quantity limits in columns (9A) and (9B) for passenger aircraft or cargo aircraft, as applicable; b. Except as provided in §173.185(c)(3) of this subchapter, the package must be marked "UN 3091 Lithium metal batteries packed with equipment", or "UN 3481 Lithium ion batteries packed with equipment," as appropriate. If a package contains both lithium metal batteries and lithium ion batteries packed with and contained in equipment, the package must be marked as required for both battery types. However, button cell batteries installed in equipment (including circuit boards) need not be considered; and c. The shipping paper must indicate "UN 3091 Lithium metal batteries packed with equipment" or "UN 3481 Lithium ion batteries packed with equipment," as appropriate. If a package contains both lithium metal batteries and lithium ion batteries packed with and contained in equipment, then the shipping paper must indicate both "UN 3091 Lithium metal batteries packed with equipment" and "UN 3481 Lithium ion batteries packed with equipment."
422 - When labelling is required, the label to be used must be the label shown in §172.447. Labels conforming to requirements in place on December 31, 2016 may continue to be used until December 31, 2018. When a placard is displayed, the placard must be the placard shown in §172.560.
A54 - Lithium batteries or lithium batteries contained or packed with equipment that exceed the maximum gross weight allowed by Column (9B) of the 172.101 Table may only be transported on cargo aircraft if approved by the Associate Administrator.
A101 - A primary (non-rechargeable) lithium battery or cell packed with equipment is forbidden for transport aboard a passenger carrying aircraft unless: a. The battery or cell complies with the requirements and limitations of 173.185(b)(1), (b)(2), (b)(3), (b)(4) and (b)(6) or 173.185(c)(1), (c)(2), (c)(3) and (c)(5) of this subchapter; b. The package contains no more

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	than the number of lithium batteries or cells necessary to power the intended piece of equipment; c. The equipment and the battery or cell are packed in a strong packaging; d. The gross weight of the package does not exceed 5 kg. Packages complying with the requirements of this special provision are excepted from all other requirements of this subchapter.
DOT Packaging Exceptions (49 CFR 173.xxx)	: 185
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	: 5 kg
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	: 35 kg
DOT Vessel Stowage Location	: A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel.
Emergency Response Guide (ERG) Number	: 138
Other information	: No supplementary information available.

Transportation of Dangerous Goods

Transport document description	: UN3091 LITHIUM METAL BATTERIES PACKED WITH EQUIPMENT, 9
UN-No. (TDG)	: UN3091
Proper Shipping Name (Transportation of Dangerous Goods)	: LITHIUM METAL BATTERIES PACKED WITH EQUIPMENT
TDG Primary Hazard Classes	: 9 - Class 9 - Miscellaneous Products, Substances or Organisms
TDG Special Provisions	: 34 - (1) These Regulations, except for Part 1 (Coming into Force, Repeal, Interpretation, General Provisions and Special Cases) and Part 2 (Classification), do not apply to the handling, offering for transport or transporting of lithium cells and batteries on a road vehicle, a railway vehicle or a vessel on a domestic voyage if (a) for a lithium metal or lithium alloy cell, the lithium content is not more than 1 g, and, for a lithium-ion cell, the watt-hour rating is not more than 20 Wh; (b) for a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g, and for a lithium-ion battery, the watt-hour rating is not more than 100 Wh; (c) lithium ion batteries are marked with the watt-hour rating on the outside case, except for those manufactured before January 1, 2009; (d) each cell and battery type passes each of the tests set out in paragraph 2.43.1(2)(a) of Part 2 (Classification); (e) the cells and batteries are afforded protection against short circuit, including protection against contact with conductive materials within the same packaging that could lead to a short circuit; (f) the cells and batteries are packed in a means of containment that completely encloses the cells and batteries; (g) the gross mass of the cells and batteries does not exceed 30 kg, except when the cells and batteries are installed in or packed with equipment; and (h) the cells and batteries are packed in a means of containment capable of withstanding a 1.2 m drop test in any orientation without damage to the cells or batteries contained inside the means of containment, without the contents shifting so as to allow battery-to-battery or cell-to-cell, contact, and without release of contents. (2) Cells and batteries referred to in subsection (1) that are installed in equipment must, unless they are afforded equivalent protection by the equipment in which they are contained, (a) be afforded protection against damage and short circuit, including protection against contact with conductive materials within the same packaging that could lead to a short circuit; (b) subject to subsection (3), be fitted to prevent accidental activation; and (c) be packed in a means of containment designed, constructed, filled, closed, secured and maintained so that under normal conditions of transport, including handling, there will be no release of the dangerous goods that could endanger public safety. (3) Paragraph (2)(b) does not apply to cells and batteries installed in devices that are intentionally active during transport such as radio frequency identification transmitters, watches and sensors, and that are not capable of generating a dangerous evolution of heat. (4) Except for means of containment containing button cell batteries installed in equipment, including circuit boards, or no more than four cells installed in equipment or no more than two batteries installed in equipment, each means of containment must be marked with the appropriate lithium battery mark in accordance with section 4.24. (5) Despite subsection (4), except for means of containment containing button cell batteries installed in equipment, including circuit boards, or no more than four cells installed in equipment or no more than two batteries installed in equipment, each means of containment may, until December 31, 2018, be marked with the following: (a) "lithium metal", "lithium métal", "lithium ion" or "lithium ionique", as appropriate; (b) an indication that the means of containment must be handled with care and that a flammability hazard exists if the means of containment is damaged; (c) an indication that special procedures must be followed in the event the means of containment is damaged, including inspection and repacking, if necessary; and

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(d) a telephone number to call for additional information, 123 - (1) The testing requirements in subsection 38.3 of Part III of the Manual of Tests and Criteria do not apply to production runs consisting of not more than 100 cells and batteries or to pre-production prototypes of cells and batteries that are transported on a road vehicle, a railway vehicle or a vessel on a domestic voyage if

(a) the cells or batteries are imported, offered for transport, handled or transported in accordance with Packing Instruction P910 of the UN Recommendations; and

(b) the pre-production prototypes of cells and batteries are in transport for the purpose of testing.

(2) Despite paragraph (1)(b), batteries that have a total mass of 12 kg or more and that have a strong, impact-resistant outer casing, or assemblies of them, may be packed in an outer means of containment or protective enclosure designed, constructed, filled, closed, secured and maintained so that under normal conditions of transport, including handling, there will be no release of the dangerous goods that could endanger public safety. The batteries or battery assemblies must be protected from short-circuit, 137 - (1) This shipping name applies to lithium ion cells or batteries, and lithium metal cells or batteries, that are damaged or defective and do not conform to subsection 2.43.1(2) of Part 2 (Classification).

(2) Lithium ion cells or batteries and lithium metal cells or batteries that are damaged or defective, include, but are not limited to, cells or batteries that have leaked or vented, or have sustained physical or mechanical damage, and cannot be diagnosed prior to transport, or that have been identified as being defective for safety reasons.

(3) Lithium ion cells or batteries and lithium metal cells or batteries that are damaged or defective must be packed in accordance with Packing Instructions P908 or LP904 of the UN Recommendations, as applicable.

(4) As applicable, the outer means of containment or the overpack must be marked legibly and visibly on a contrasting background, with the words "Damaged/Defective Lithium Ion Batteries", "piles au lithium ionique endommagées/défectueuses", "Damaged/Defective Lithium Metal Batteries" or "piles au lithium métal endommagées/défectueuses".

(5) It is forbidden to transport lithium ion cells or batteries and lithium metal cells or batteries that are damaged or defective and that, under normal conditions of transport, are liable to disassemble rapidly, react dangerously, produce a flame or a dangerous evolution of heat, or produce a dangerous emission of toxic, corrosive or flammable gases or vapours.

(6) It is forbidden to transport by aircraft lithium ion cells or batteries and lithium metal cells or batteries that are damaged or defective, 138 - (1) When transported for disposal or recycling, lithium ion cells or batteries and lithium metal cells or batteries, or equipment containing those cells or batteries,

(a) are not subject to subsection 2.43.1(2) of Part 2 (Classification);

(b) must be packed in accordance with Packing Instructions P909 or LP904 of the UN Recommendations, as applicable, whether packed with or without non-lithium cells or batteries or equipment containing those cells or batteries;

(c) must be in a means of containment or an overpack that is marked legibly and visibly on a contrasting background with the words "Lithium batteries for disposal", "Piles au lithium destinées à l'élimination", "Lithium batteries for recycling" or "Piles au lithium destinées au recyclage", as appropriate; and

(d) are forbidden for transport by aircraft.

(2) Damaged or defective cells and batteries must be offered for transport or transported under special provision 137, 159 - (1) Subject to subsection (2), the label to be used for these dangerous goods is the one illustrated under the heading for lithium batteries "Class 9, Lithium Batteries" in the appendix to Part 4 (Dangerous Goods Safety Marks).

(2) The generic Class 9 label may be used until December 31, 2018.

Explosive Limit and Limited Quantity Index : 0
Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index : 5 kg

Transport by sea

Transport document description (IMDG) : UN 3091 LITHIUM METAL BATTERIES PACKED WITH EQUIPMENT, 9
UN-No. (IMDG) : 3091
Proper Shipping Name (IMDG) : LITHIUM METAL BATTERIES PACKED WITH EQUIPMENT
Class (IMDG) : 9 - Miscellaneous dangerous substances and articles
Limited quantities (IMDG) : 0

Air transport

Transport document description (IATA) : UN 3091 Lithium metal batteries packed with equipment, 9A
UN-No. (IATA) : 3091
Proper Shipping Name (IATA) : Lithium metal batteries packed with equipment

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Class (IATA)

: 9 - Miscellaneous Dangerous Goods

SECTION 15: Regulatory information

15.1. US Federal regulations

Lithium (7439-93-2)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Manganese oxide (MnO₂) (1313-13-9)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Polypropylene (9003-07-0)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

EPA TSCA Regulatory Flag

XU - XU - indicates a substance exempt from reporting under the Chemical Data Reporting Rule, (40 CFR 711).

Graphite (7782-42-5)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Chromium (7440-47-3)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Subject to reporting requirements of United States SARA Section 313

CERCLA RQ

5000 lb no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm

Iron (7439-89-6)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Perchloric acid, lithium salt (7791-03-9)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Ethylene glycol dimethyl ether (110-71-4)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

EPA TSCA Regulatory Flag

S - S - indicates a substance that is identified in a final Significant New Use Rule.

Propylene carbonate (108-32-7)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations

CANADA

Lithium (7439-93-2)

Listed on the Canadian DSL (Domestic Substances List)

Manganese oxide (MnO₂) (1313-13-9)

Listed on the Canadian DSL (Domestic Substances List)

Polypropylene (9003-07-0)

Listed on the Canadian DSL (Domestic Substances List)

Graphite (7782-42-5)

Listed on the Canadian DSL (Domestic Substances List)

Chromium (7440-47-3)

Listed on the Canadian DSL (Domestic Substances List)

Iron (7439-89-6)

Listed on the Canadian DSL (Domestic Substances List)

Perchloric acid, lithium salt (7791-03-9)

Listed on the Canadian DSL (Domestic Substances List)

Ethylene glycol dimethyl ether (110-71-4)

Listed on the Canadian DSL (Domestic Substances List)

Propylene carbonate (108-32-7)

Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

Lithium (7439-93-2)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

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Manganese oxide (MnO₂) (1313-13-9)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

Graphite (7782-42-5)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

Chromium (7440-47-3)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

Iron (7439-89-6)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

Perchloric acid, lithium salt (7791-03-9)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

Ethylene glycol dimethyl ether (110-71-4)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

Propylene carbonate (108-32-7)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

National regulations

Lithium (7439-93-2)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on KECL/KECI (Korean Existing Chemicals Inventory)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on the TCSI (Taiwan Chemical Substance Inventory)

Manganese oxide (MnO₂) (1313-13-9)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on KECL/KECI (Korean Existing Chemicals Inventory)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Japanese Pollutant Release and Transfer Register Law (PRTR Law)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on the TCSI (Taiwan Chemical Substance Inventory)

Polypropylene (9003-07-0)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on KECL/KECI (Korean Existing Chemicals Inventory)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on the TCSI (Taiwan Chemical Substance Inventory)

Graphite (7782-42-5)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on KECL/KECI (Korean Existing Chemicals Inventory)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on the TCSI (Taiwan Chemical Substance Inventory)

Chromium (7440-47-3)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on KECL/KECI (Korean Existing Chemicals Inventory)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Japanese Pollutant Release and Transfer Register Law (PRTR Law)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on the TCSI (Taiwan Chemical Substance Inventory)

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Iron (7439-89-6)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on KECL/KECI (Korean Existing Chemicals Inventory)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on the TCSI (Taiwan Chemical Substance Inventory)

Perchloric acid, lithium salt (7791-03-9)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on KECL/KECI (Korean Existing Chemicals Inventory)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on the TCSI (Taiwan Chemical Substance Inventory)

Ethylene glycol dimethyl ether (110-71-4)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on KECL/KECI (Korean Existing Chemicals Inventory)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on the TCSI (Taiwan Chemical Substance Inventory)

Propylene carbonate (108-32-7)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on KECL/KECI (Korean Existing Chemicals Inventory)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on the TCSI (Taiwan Chemical Substance Inventory)

15.3. US State regulations

No additional information available

SECTION 16: Other information

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations (According to HCS-2012 APPENDIX D TO §1910.1200)

Revision date : 12/08/2020
Data sources : LOLI.
Training advice : Normal use of this product shall imply use in accordance with the instructions on the packaging.

Abbreviations and acronyms:

BOD	Biochemical oxygen demand (BOD)
BCF	Bioconcentration factor
BLV	Biological limit value
CAS-No.	Chemical Abstract Service number
COD	Chemical oxygen demand (COD)
ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
IOELV	Indicative Occupational Exposure Limit Value
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
LC50	Median lethal concentration

Coin type Lithium Manganese Dioxide Batteries(CR) 3V

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations (According to HCS-2012 APPENDIX D TO §1910.1200)

EC50	Median effective concentration
LD50	Median lethal dose
NOEC	No-Observed Effect Concentration
N.O.S.	Not Otherwise Specified
OEL	Occupational Exposure Limit
OECD	Organisation for Economic Co-operation and Development
PBT	Persistent Bioaccumulative Toxic
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
SDS	Safety Data Sheet
STP	Sewage treatment plant
vPvB	Very Persistent and Very Bioaccumulative
VOC	Volatile Organic Compounds

SDS US (GHS HazCom 2012)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.