

DONGGUAN GOLDEN CEL BATTERY CO., LTD.

MATERIAL SAFETY DATA SHEET (MSDS)

According European Directive 2001/58/CE

Issue Date 22/05/2019

Rev: 2019-079G

1. Product & Company Identification

| | | | |
|----------------------|--|--|------------------|
| Product Description: | Li-Ion Polymer Battery | DONGGUAN GOLDEN CEL BATTERY CO., LTD www.celbattery.com | |
| Address: | YingHu industrial Zone, JiaoYiTang, TangXia Town, DongGuan | | |
| Telephone: | +86-769-82195308 | FAX: | +86-769-87982226 |

Product information:

Name: lithium-ion batteries Model: 652753

Nominal voltage: 3.7V Rated capacity: 900mAh Electric energy: 3.33Wh

Weight: 18g

Chemical characterization: Mixture

| Chemical Composition | Molecular formula | CAS NO. | Weight(%) |
|-----------------------|--------------------|------------|-----------|
| Lithium cobalt acid | LiCoO ₂ | 12190-79-3 | 39.07% |
| Aluminium foil | AL | 7429-90-5 | 5.21% |
| graphite | C | 7782-42-5 | 19.54% |
| Copper foil | Cu | 7440-50-8 | 9.47% |
| Positive Tab | AL | 7429-90-5 | 0.59% |
| Negative Tab | Ni | 7440-02-0 | 1.18% |
| Separator | PE | 9002-88-4 | 0.47% |
| Electrolyte | LiPF ₆ | 21324-40-3 | 16.57% |
| Aluminum plastic film | AL | 7429-90-5 | 2.96% |
| | PP | 9003-07-0 | |

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| | | | |
|--------------|-----------------|-------------|-------|
| PCM | Epoxy resin | 38891-59-7 | 3.95% |
| | Sn | 7440-31-5 | |
| | Cu | 7440-50-8 | |
| wire | Cu | 7440-50-8 | 0.95% |
| | Silicone rubber | | |
| Solder wire | Sn | 7440-31-5 | 0.02% |
| Kapoton Tape | PolyimideFilm | 497926-97-3 | 0.02% |
| INK | INK | | 0.00% |

3. Hazardous Identification:

Emergency overview: This product is an article which contains a chemical substance.

Safety information is given for exposure to the article as sold. Intended uses of the product should not result in exposure to the chemical substance. This is a battery.

In case of rupture: the below hazards exist.

GAS# 7429-90-5

Classification according to GHS

Substances and mixtures which, in contact with water, emit flammable gases (2,3)

Specific target organ toxicity, repeated exposure (1) (Lung)



Label elements

Hazard pictogram(s):



Signal word:

Hazard statement(s):

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H261 In contact with water releases flammable gas

H372 Causes damage to organs through prolonged or repeated exposure(Lung)

H413 May cause long lasting harmful effects to aquatic life

Precautionary statement(s):

Precaution:

P223 Do not allow contact with water.

P231+P232 Handle and store contents under inert gas,Protect from moisture.

P280 Wear protective gloves,protective clothing,eye protection and face protection

P260 Do not breathe dust.

P264 Wash skin and clothing thoroughly after handling.

P270 Do not eat,drink or smoke when using this product.

P273 Avoid release to the environment.

Response:

P302+P335+P334 IF ON SKIN:Brush off loose particles from skim and immerse in cool water.

P370+P378 In case of fire:Use the appropriate media put out the fire.

P314 Get medical advice if you feel unwell.

Storage

P402+P404 Store in ady place.Store in a closed container.

Disposal:

P501 Contents handling to approved wate trestment plants.

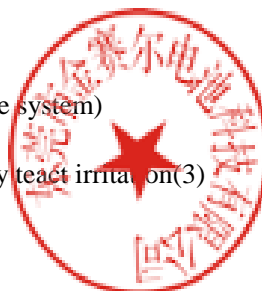
CAS#7440-50-8

Classification according to GHS

Sensitisation,skin(1,1A,1B)

Specific target organ toxicity,single exposure(1)(digestive system)

Specific target organ toxicity,single exposure;Respiratoey react irrtation(3)



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Label elements

Hazard pictogram(s):



Signal word:

Hazard statement(s):

H317 May cause an allergic skin reaction

H370 Causes damage to organs(digestive system)

H335 May cause respiratory imitaion

Precautionary statement(s):

Prevention:

P260 Do not breathe dust:

P272 Contaminated work clothing should not be allowed out of the workplace

P280 Wear protective gloves,eye protection,face protecion.

P264 Wash skin and clothing thoroughly affer handling.

P270 Do not eat,drink or smoke when using this product.

P271 Use only outdoors or in a well-ventilaed area.

Response:

P302+P352 IF ON SKIN:Wask with plenty water.

P333+P313 IF skin irritation or rash occurs:Get medical advice.

P321 Specific treatment(See additional emergency instructions).

P362+P364 Take off contaminated clothing and wash it before reuse.

P308+P311 IF exposed or concerned:Cell a POISON CENTER.

P304+P340 IF INHALED:Remove person to fresh air and keep comfortable for breathing.

P312 Call a POISON CENTER or doctor,if you feel unwell.



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Storage

P403+P233 Store in a well-ventilated place.Keep container tightly closed.

P405 Store locked up.

Disposal:

P501 Contents or container handling to approved waste treatment plants.

Other hazards

Physical and chemical hazards:See Section 10

Human health hazards:See Section 11

Environmental hazards:See Section 12

4. First Aid Measures

Description of first aid measures

General information No special measures required.

After eye contact

Flush eyes with plenty of water for several minutes while holding eyelids open. Get medical attention if irritation persists.

After skin contact

Remove contaminated clothing and shoes. Immediately wash with water and soap and rinse thoroughly. Wash clothing and shoes before reuse. If irritation occurs, get medical attention.

After inhalation

Remove victim to fresh area. Administer artificial respiration if breathing is difficult. Seek medical attention.

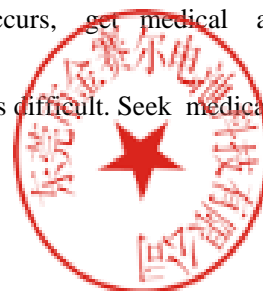
After swallowing

Do not induce vomiting. Get medical attention.

Personal protective equipment for first-aid responders:Not available

Most important symptoms/effects,acute and delayed:Not available

Indication of immediate medical attention and special treatment needed:Not data available



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5. Fire Fighting Measures

Suitable extinguishing agents

Use extinguishing agent suitable for local conditions and the surrounding environment Such as dry powder , CO₂.

Unsuitable extinguishing media:

Not data available.

Special hazards arising from the chemical:

Special hazards arising from the substance or mixture

Battery may burst and release hazardous decomposition products when exposed to a fire situation. Lithium ion batteries contain flammable electrolyte that may vent, ignite and produce sparks when subjected to high temperature(>150°C(302°F)), when damaged or abused (e.g. mechanical damage or electrical overcharging); may burn rapidly with flare-burning effect; may ignite other batteries in clothes proximity.

Specific protective actions fire-fighters:

Protective equipment:Wear self-contained respirator.Wear fully protective impervious suit.

6. Accidental Release Measures

Protective precautions:

Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation

Protective equipment:

Not data available.

Emergency procedures:

Remove ignition sources, evacuate area. Sweep up using a method that does not generate dust. Collect as much of the spilled material as possible, placed the spilled material into a suitable disposal container. Keep spilled material out of sewers, ditches and bodies of water.

Environmental precautions:

Do not allow material to be released to the environment without proper governmental permits

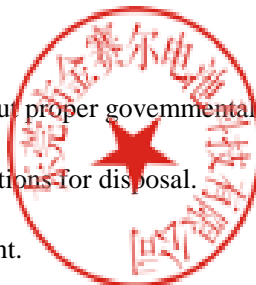
Methods and materials for containment and cleaning up:

All waste must refer to United Nations,the national and regulations for disposal.

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.



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7. Handling & Storage

Precautions for safe handling

Consumption of food and beverage should be avoided in work areas.

Wash hands with soap and water before eating, drinking.

Ground containers when transferring liquid to prevent static accumulation and discharge.

Information about fire and explosion protection

Batteries may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.

Conditions for safe storage, including any incompatibilities

Requirements to be met by storerooms and receptacles

Store in a cool, dry, well-ventilated place.

Information about storage in one common storage facility

Keep away from heat, avoiding the long time of sunlight.

Further information about storage conditions

Keep container tightly sealed.

Specific and use

No further relevant information available.

8. Exposure Control/Personal Protection

Control parameters

| CAS No | ACGIH | NIOSH | OSHA |
|------------|--|---|--|
| 12190-79-3 | N/A | N/A | N/A |
| 24937-79-9 | N/A | N/A | N/A |
| 7782-42-5 | TLV-TWA 2mg/m ³ | REL-TWA 2.5mg/m ³ | PEL-TWA 15mppcf PEL-TWA 20mppcf |
| 61789-96-6 | N/A | N/A | N/A |
| 96-49-1 | N/A | N/A | N/A |
| 7429-90-5 | TLV-TWA 1mg/m ³ | REL-TWA 2mg/m ³ REL-TWA 5mg/m ³ REL-TWA 10mg/m ³ | PEL-TWA 5mg/m ³ PEL-TWA 10mg/m ³ |
| 7440-50-8 | TLV-TWA 0.2mg/m ³ TLV-TWA 1mg/m ³ | REL-TWA 1mg/m ³ REL-TWA 0.1mg/m ³ | REL-TWA 0.11g/m ³ REL-TWA 1mg/m ³ |
| 9002-88-4 | N/A | N/A | N/A |
| 21324-40-3 | N/A | N/A | N/A |
| 9003-07-0 | N/A | N/A | N/A |

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Appropriate engineering controls:

The usual precautionary measures for handling chemicals should be followed

Keep away from foodstuffs, beverages and feed.

Remove all soiled and contaminated clothing immediately.

Wash hands before breaks and at the end of work.

Personal Protective Equipment

Respiratory protection: Wear suitable protective mask in order to reduce the respiratory System. A large number of leakage,

wear chemical protective clothing, including self-contained breathing apparatus.

Hand Protection: Wear appropriate protective gloves to reduce skin contact.

Eyes Protection: Wear safety goggles or eye protection combined with respiratory protection

Skin and Body Protection: Working environment required, wear suitable protective clothing to minimize contact with skin.

The type of protective equipment must be according to the concentration and the content of certain hazardous

9. Physical and Chemical Properties

Information on basic physical and chemical properties

| | |
|---|----------------|
| Colour: | Silver. |
| Physical State: | Prismatic. |
| Odour: | Not available. |
| Odour threshold: | Not available. |
| pH: | Not available. |
| Melting point/freezing point: | Not available. |
| Initial boiling point and boiling range: | Not available. |
| Flash point: | Not available. |
| Evaporation rate: | Not available. |
| Flammability(solid,gas): | Not available. |
| Explosion Limits(vol% in air): | Not available. |
| Vapour pressure,kPa at 20°C: | Not available. |
| Vapour density: | Not available. |
| Density/Relative density(water=1): | Not available. |
| solubility(ies): | Not available. |
| Partition coefficient:n-octanol/water: | Not available. |
| Auto-ignition temperature: | Not available. |
| Decomposition temperature: | Not available. |
| Viscosity | Not available. |
| Other information: | |
| Voltage | 3.7V |
| Electric capacity | 900mAh |
| Electric Energy | 3.33Wh |



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10. Stability and Reactivity

Reactivity: Data not available.

Chemical stability: Stable.

Possibility of hazardous reactions: Data not available.

Conditions to Avoid: Flames, sparks, and other sources of ignition, incompatible materials

Incompatibilities materials: Oxidizing agents, acid, base

Hazardous decomposition products: Carbon monoxide, carbon dioxide, lithium oxide fumes

11. Toxicological information

Acute Toxicity

| CAS No. | LC50/LD50 |
|------------|-----------------------|
| 12190-79-3 | Not available. |
| 24937-79-9 | Not available. |
| 7782-42-5 | Not available. |
| 61789-96-6 | Not available. |
| 96-49-1 | LD50Rat(Oral): 10g/kg |
| 9003-07-0 | Not available. |
| 7429-90-5 | Not available. |
| 7440-50-8 | Not available. |
| 9002-88-4 | Not available. |
| 21324-40-3 | Not available. |

Skin corrosion/irritation: Not available.

Serious eye damage/irritation: Not available.

Respiratory or Skin sensitization: Not available.

Germ Cell mutagenicity: Not available.

Carcinogenicity: Not available.

Reproductive toxicity: Not available.

Specific target organ toxicity-Single exposure: Not available.

Specific target organ toxicity-Repeated exposure: Not available.

Aspiration hazard: Not available.

Information on the likely of exposure: Not available.

Eye: Not available.

Skin: Not available.

Ingestion: Not available.

Inhalation: Not available.



12. Ecological information

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Ecological toxicity: No data available.

Persistence and degradability: No data available.

Bioaccumulative potential: No data available.

Mobility in soil: No data available.

Other adverse effects:No data available.

13. Disposal considerations

Disposal methods:

Recommendation:

Consult state,local or national regulations to ensure proper disposal.

Uncleaned packaging

Recommendation:Disposal must be made according to official regulations.

14. Transport Information

According to the Packing Instruction 965~967 IATA DGR 60th Edition for transportation, or the special provision 188 of IMDG, or the <<Recommendations On The Transport Of Dangerous Goods-Model Regulations>> (18).

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

Separate Lithium-ion batteries when shipping to prevent short-circuiting. They should be packed in strong packaging for support during transport. Take in a cargo of them without falling, dropping, and breakage. Prevent collapse of cargo piles and wet by rain.

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

15. Regulatory Informatin

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

| CAS No. | TSCA | IECSC | DSL/NDSL | EINECS/ELINCS/ NLP |
|------------|--------|--------|------------|-----------------------|
| 12190-79-3 | Listed | Listed | Listed DSL | Listed |
| 24937-79-9 | Listed | Listed | Listed DSL | Listed |
| 24937-79-9 | Listed | Listed | Listed DSL | Listed |
| 9002-88-4 | Listed | Listed | Listed DSL | Listed |
| 7440-50-8 | Listed | Listed | Listed DSL | Listed |
| 7429-90-5 | Listed | Listed | Listed DSL | Listed |
| 9003-07-0 | Listed | Listed | Listed DSL | Not Listed |
| 61789-96-6 | Listed | Listed | Listed DSL | Not Listed |
| 21324-40-3 | Listed | Listed | Listed DSL | Listed |

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| | | | | |
|---------|--------|--------|------------|--------|
| 96-49-1 | Listed | Listed | Listed DSL | Listed |
|---------|--------|--------|------------|--------|

16. Additional Information

Abbreviations and acronyms

| | |
|-----------------|---|
| CAS: | Chemical Abstracts Service; |
| EC: | European Commission; |
| ACGIH: | American Conference of Governmental Industrial Hygienists |
| NIOSH: | US National Institute for Occupational Safety and Health |
| OSHA: | US Occupational Safety and Health |
| TLV: | Threshold Limit Value |
| TWA: | Time Weighted Average |
| STEL: | Short Term Exposure Limit |
| PEL: | Permissible Exposure Level |
| REL: | Recommended Exposure Limit |
| PC-STEL: | Permissible concentration-time weighted average |
| PC-TWA: | Permissible concentration-short time exposure limit |
| LC50: | Lethal concentration, 50 percent kill |
| LD50: | Lethal dose, 50 percent kill |
| IARC: | International Agency for Research on Cancer |
| EC50: | Median effective concentration |
| BCF: | Bioconcentration Factor |
| BOD: | Biochemical oxygen demand |
| NOEC: | No observed effect concentration |
| NTP: | US National Toxicology Program |
| RTECS: | Registry of Toxic Effects of Chemical Substances |
| IATA: | International Air Transport Association |
| IMDG: | International Maritime Dangerous Goods |
| TDG: | Recommendations on the TRANSPORT OF DANGEROUS GOODS Model Regulations |
| TOC: | Total Organic Carbon |
| TSCA: | Toxic Substances Control Act of USA |
| DSL: | the Domestic Substances List of Canada |
| NDSL: | the Non-domestic Substances List of Canada |

17. UN Classes:

Classified as Lithium ion batteries (UN3481), 2019 IATA Dangerous Goods regulations 60th edition Packing Instruction PI967 Section II is applied. The product is handled as Non-Dangerous Goods by meeting the following requirements. (1)

Lithium ion cells and batteries offered for transport are not subject to other additional requirements of the UN Regulations if they meet the following: (1) (3)

1. for cells, the watt-hour rating is not more than 20Wh;
2. for batteries, the watt-hour rating is not more than 100Wh.
3. each cell or battery is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria Part III subsection 38.3.



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All Li Polymer batteries with the necessary testing requirements under the UN38.3 Manual of Tests and Criteria as referenced in the following transportation regulations.

1. UN recommendations on the Transport of Dangerous Goods Model Regulations.
2. U.S Department of Transportation of Dangerous Goods Model Regulations.
3. International Civil Aviation Organization (ICAO) Technical Instructions
4. International Maritime Dangerous Goods (IMDG) code

Li Polymer Battery are exempted from these regulations since they meet all UN testing requirements and contain no more than 8 grams of equivalent lithium content (see 49 CFR 173.185 of the US HMR, IATA Dangerous Goods Regulations and Special Provision 188 of the IMDG Code and UN model Regulations.

18. Other information

The information contained herein is furnished without warranty of any kind. Users should consider this data only as a supplement to other information gathered by them and must make independent determinations of the suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers.

Reference

Chemical substances information: Japan Advanced Information center of Safety and Health
International Chemical Safety Cards (ICSCs): International Occupational Safety and Health Information Centre (CIS)
2002 TLVs and BEIs: American Conference of Governmental Industrial Hygienists (ACGIH)
Dangerous Goods Regulations -The60th edition 1 January 2019: International Air Transport Association (IATA)
IMDG Code - 2006 Edition: International Maritime Organization (IMO)
RTECS (CD-ROM)
MSDS of raw materials prepared by the manufacturers.



End