SDS

SAFETY DATA SHEET

According to 2012 OSHA Hazard Communication Standard
(49 CFR 173.185, 49 CFR 172.102)

Goods Name	:	**Lithium-ion Polymer Rechargeable Battery**
Model Name	:	**ZN 123255**
Applicant	:	**GUANGDONG ZHAONENG TECHNOLOGY CO., LTD.**
Report Number	:	**KS2011S02023B04**
Issue Date	:	**November 20, 2020**

Written by: Jessica Yang **Approved by:** Sam Yu.

KSIGN(Guangdong) Testing Co., Ltd.

Safety Data Sheet

According to 2012 OSHA Hazard Communication Standard
(49 CFR 173.185, 49 CFR 172.102)

Report No.: KS2011S02023B04

* The SDS is prepared based on the information provided by client. The contents and formats of this SDS are revised as per client's request.

1. IDENTIFICATION

Product identifier

Product Name Lithium-ion Polymer Rechargeable Battery(Model: ZN 123255)

Other means of identification

Product description Rating: 3.7d.c., 2000mAh, 7.4Wh
Weight: appr. 32.8g
Dimensions: Max.: 12.0mmx34.0mmx53.0mm

Trademark

Recommended use of the chemical and restrictions on use

Recommended Use LITHIUM ION BATTERIES

Restrictions on use No information available

Details of the supplier of the Safety Data Sheet

Initial supplier identifier GUANGDONG ZHAONENG TECHNOLOGY CO., LTD.

Address No.8 Nanda Road, Jinsha Chengnan Industrial Zone, Danzao Town, Nanhai District, Foshan city, Guangdong, China

Telephone +86-757-81289782

Website http://www.zhaoneng-battery.com/

E-mail info@zhaoneng-battery.com

Emergency telephone number

Company Emergency Phone Number +86-757-81289782

2. HAZARDS IDENTIFICATION

Classification LITHIUM ION BATTERIES

Acute toxicity - Dermal	Category 4
Skin corrosion/irritation	Category 1 Sub-category B
Serious eye damage/eye irritation	Category 1
Skin sensitization	Category 1
Carcinogenicity	Category 1B
Specific target organ toxicity (repeated exposure)	Category 1

GHS Label elements, including precautionary statements

Signal Word: Danger

Hazard Label

Hazard statements
This is a battery. In case of rupture:.
Harmful in contact with skin
Causes severe skin burns and eye damage
May cause an allergic skin reaction
May cause cancer
Causes damage to organs through prolonged or repeated exposure

CAS#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) (respiratory system)
H261 in contact with water releases flammable gas
H372 causes damage to organs through prolonged or repeated exposure (respiratory system)

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; Respiratory tract irritation(3)
H317 May cause an allergic skin reaction
H370 causes damage to organs (digestive system)
H335 May cause respiratory irritation

Precautionary Statements - Prevention
CAS#7429-90-5
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.

CAS# 7440-50-8
P260 Do not breathe dust, fume.
P272 contaminated work clothing should not be allowed out of the workplace.
P280 wear protective gloves, eye protection, face protection.
P264 wash skin and clothing thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 use only outdoors or in a well-ventilated area.

Precautionary Statements - Response
CAS#7429-90-5
P302+ P335+ P334IFON SKIN: Brush off loose particles from skin 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.

CAS# 7440-50-8
P302+ P352 IF ON SKIN: wash 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: call a POISON CENTER.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312 call a POISON CENTER if you feel unwell.

Eyes
Immediately call a POISON CENTER or doctor
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

Skin
Call a POISON CENTER or doctor if you feel unwell
Take off contaminated clothing and wash it before reuse
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]
If skin irritation or rash occurs: Get medical advice/attention
Wash contaminated clothing before reuse

Inhalation
IF INHALED: Remove person to fresh air and keep comfortable for breathing
Immediately call a POISON CENTER or doctor

Ingestion
IF SWALLOWED: Rinse mouth. DO NOT induce vomiting

Precautionary Statements - Storage
Store locked up

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

Other information
May be harmful if swallowed Very toxic to aquatic life Very toxic to aquatic life with long lasting effects

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Not applicable.

Mixture

Chemical name	CAS No.	Weight-%	Hazardous Material Information Review Act registry number (HMIRA registry #)	Date HMIRA filed and date exemption granted (if applicable)
Lithium Cobalt Oxide	12190-79-3	32	-	-
Graphite	7782-42-5	20	-	-
Carbon black	1333-86-4	8	-	-
Phosphate(1-), hexafluoro-, lithium	21324-40-3	21	-	-
Copper	7440-50-8	10	-	-
Aluminum foil	7429-90-5	7	-	-
Nickel	7440-02-0	2	-	-

4. FIRST AID MEASURES

Description of first aid measures

General advice First aid is upon rupture of sealed battery. Show this Safety Data Sheet to the doctor in attendance. Immediate medical attention is required. IF exposed or concerned: Get medical advice/attention.

Inhalation Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur.

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.

Skin contact Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get immediate medical advice/attention. May cause an allergic skin reaction.

Ingestion Do NOT induce vomiting. Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Get immediate medical advice/attention.

Self-protection of the first aider Ensure that medical personnel are aware of the material(s) involved, take

precautions to protect themselves and prevent spread of contamination. Wear personal protective clothing (see section 8). Avoid contact with skin, eyes or clothing. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation.

Most important symptoms and effects, both acute and delayed

Symptoms Burning sensation. Itching. Rashes. Hives.

Indication of any immediate medical attention and special treatment needed

Note to physicians Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure. May cause sensitization in susceptible persons. Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Large Fire CAUTION: Use of water spray when fighting fire may be inefficient.

Unsuitable extinguishing media Do not scatter spilled material with high pressure water streams.

Specific hazards arising from the chemical The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating gases and vapors. Product is or contains a sensitizer. May cause sensitization by skin contact.

Hazardous Combustion Products Carbon oxides.

Explosion Data

Sensitivity to Mechanical Impact None.

Sensitivity to Static Discharge None.

Special protective equipment for fire-fighters Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required. Attention! Corrosive material. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

Other Information Refer to protective measures listed in Sections 7 and 8.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Pick up and transfer to properly labeled containers.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling In case of rupture: Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. In case of insufficient ventilation, wear suitable respiratory equipment. Handle product only in closed system or provide appropriate exhaust ventilation. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash before reuse.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Store locked up. Protect from moisture. Keep out of the reach of children. Store away from other materials.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Limits .

Chemical name	Alberta	British Columbia	Ontario TWAEV	Quebec
Lithium Cobalt Oxide (CoLiO2) 12190-79-3	TWA: 0.02 mg/m^3	TWA: 0.02 mg/m^3	TWA: 0.02 mg/m^3	TWA: 0.02 mg/m^3
Graphite 7782-42-5	TWA: 2 mg/m^3	TWA: 2 mg/m^3	TWA: 2 mg/m^3	TWA: 2 mg/m^3
Phosphate(1-), hexafluoro-, lithium 21324-40-3	TWA: 2.5 mg/m^3	TWA: 2.5 mg/m^3	TWA: 2.5 mg/m^3	TWA: 2.5 mg/m^3
Copper 7440-50-8	TWA: 0.2 mg/m^3 TWA: 1 mg/m^3	TWA: 1 mg/m^3 TWA: 0.2 mg/m^3	TWA: 0.2 mg/m^3 TWA: 1 mg/m^3	TWA: 0.2 mg/m^3 TWA: 1 mg/m^3
Carbon black 1333-86-4	TWA: 10 mg/m^3	TWA: 1.0 mg/m^3	TWA: 1 mg/m^3	TWA: 10 mg/m^3
Aluminum foil 7429-90-5	TWA: 1.5 mg/m^3	TWA: 0.05 mg/m^3	TWA: 1 mg/m^3	TWA: 1 mg/m^3

Other Exposure Guidelines Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992). See section 15 for national exposure control parameters.

Appropriate engineering controls

Engineering controls Showers
Eyewash stations
Ventilation systems.

Individual protection measures, such as personal protective equipment

Eye/face protection Face protection shield.

Hand protection	Wear suitable gloves. Impervious gloves.
Skin and body protection	Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron.
Respiratory protection	No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.
General hygiene considerations	Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Contaminated work clothing should not be allowed out of the workplace. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state	Solid
Color	Silver
Odor	No information available
Odor Threshold	No information available

Property	**Values**	**Remarks Method**
pH	No data available	None known
Melting / freezing point	No data available	None known
Boiling point / boiling range	No data available	None known
Flash Point	No data available	None known
Evaporation Rate	No data available	None known
Flammability (solid, gas)	No data available	None known
Flammability Limit in Air		None known
Upper flammability limit	No data available	
Lower flammability limit	No data available	
Vapor pressure	No data available	None known
Vapor density	No data available	None known
Relative density	No data available	None known
Water Solubility	Insoluble in water	
Solubility(ies)	No data available	None known
Partition coefficient: n-octanol/water	N/A	
Autoignition temperature	No data available	None known
Decomposition temperature	No data available	None known
Kinematic viscosity	No data available	None known
Dynamic viscosity	No data available	None known

Other Information

Explosive properties	No information available.
Oxidizing properties	No information available.
Softening Point	No information available
Molecular Weight	No information available
VOC Content (%)	No information available
Liquid Density	No information available
Bulk Density	No information available
Particle Size	No information available
Particle Size Distribution	No information available

10. STABILITY AND REACTIVITY

Reactivity	No information available.
Chemical stability	Stable under normal conditions.
Possibility of Hazardous Reactions	None under normal processing.
Hazardous Polymerization	Hazardous polymerization does not occur.
Conditions to avoid	Exposure to air or moisture over prolonged periods.
Incompatible materials	Acids. Bases. Oxidizing agent.
Hazardous Decomposition Products	Carbon oxides.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information Product does not present an acute toxicity hazard based on known or supplied information In case of rupture:

Inhalation Specific test data for the substance or mixture is not available. Corrosive by inhalation. (based on components). Inhalation of corrosive fumes/gases may cause coughing, choking, headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs. Pulmonary edema can be fatal.

Eye contact Specific test data for the substance or mixture is not available. Causes burns. (based on components). Corrosive to the eyes and may cause severe damage including blindness. Causes serious eye damage. May cause irreversible damage to eyes.

Skin contact Specific test data for the substance or mixture is not available. Corrosive. (based on components). Causes burns. May cause sensitization by skin contact. Repeated or prolonged skin contact may cause allergic reactions with susceptible persons. May be absorbed through the skin in harmful amounts. Harmful in contact with skin.

Ingestion Specific test data for the substance or mixture is not available. Causes burns. (based on components). Ingestion causes burns of the upper digestive and respiratory tracts. May cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung damage if swallowed. May be fatal if swallowed and enters airways.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms Redness. Burning. May cause blindness. Coughing and/ or wheezing. Itching. Rashes. Hives.

Numerical measures of toxicity

Acute Toxicity

The following values are calculated based on chapter 3.1 of the GHS document .

ATEmix (oral) 2,109.70 mg/kg
ATEmix (dermal) 1,265.80 mg/kg

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Lithium Cobalt Oxide 12190-79-3	> 5000 mg/kg (Rat)	> 2000 mg/kg (Rat)	> 5.05 mg/L (Rat) 4 h
Graphite 7782-42-5	-	-	> 2000 mg/m³ (Rat) 4 h
Carbon black 1333-86-4	> 9000 mg/kg (Rat)	-	> 10.2 mg/L (Rat) 1 h

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation Classification based on data available for ingredients. Causes burns.

Serious eye damage/eye irritation Classification based on data available for ingredients. Risk of serious damage to eyes. Causes burns.

Respiratory or skin sensitization May cause sensitization by skin contact.

Germ cell mutagenicity No information available.

Carcinogenicity Contains a known or suspected carcinogen. Classification based on data available for ingredients. May cause cancer.

The table below indicates whether each agency has listed any ingredient as a carcinogen.

Chemical name	ACGIH	IARC	NTP	OSHA
Lithium Cobalt Oxide (CoLiO2) 12190-79-3	A3	Group 2B	Reasonably Anticipated	X
Carbon black 1333-86-4	-	Group 2B	Reasonably Anticipated	X

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)
A3 - Animal Carcinogen
IARC (International Agency for Research on Cancer)
Group 2B - Possibly Carcinogenic to Humans
NTP (National Toxicology Program)
Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen
OSHA (Occupational Safety and Health Administration of the US Department of Labor)
X - Present

Reproductive toxicity No information available.

STOT - single exposure No information available.

STOT - repeated exposure Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity Very toxic to aquatic life with long lasting effects. .

Chemical name	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Daphnia Magna (Water Flea)
Supplier Trade Secret	-	96h LC50: > 100 mg/L (Danio rerio)	-	-
Supplier Trade Secret	72h EC50: 0.0426 - 0.0535 mg/L (Pseudokirchneriella subcapitata) 96h EC50: 0.031 - 0.054 mg/L (Pseudokirchneriella subcapitata)	96h LC50: = 0.052 mg/L (Oncorhynchus mykiss) 96h LC50: = 0.3 mg/L (Cyprinus carpio) 96h LC50: 0.0068 - 0.0156 mg/L (Pimephales promelas) 96h LC50: = 0.2 mg/L (Pimephales promelas) 96h LC50: = 0.8 mg/L (Cyprinus carpio) 96h LC50: = 0.112 mg/L (Poecilia reticulata) 96h LC50: = 1.25 mg/L (Lepomis macrochirus) 96h LC50: < 0.3 mg/L (Pimephales promelas)	-	48h EC50: = 0.03 mg/L
Supplier Trade Secret	96h EC50: 0.174 - 0.311 mg/L (Pseudokirchneriella subcapitata) 72h EC50: = 0.18 mg/L (Pseudokirchneriella subcapitata)	96h LC50: = 1.3 mg/L (Cyprinus carpio) 96h LC50: = 10.4 mg/L (Cyprinus carpio) 96h LC50: > 100 mg/L (Brachy danio rerio)	-	48h EC50: = 1 mg/L 48h EC50: > 100 mg/L

Persistence and Degradability No information available.

Bioaccumulation There is no data for this product.

Mobility No information available.

Other adverse effects No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused products Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.

Contaminated packaging Do not reuse empty containers.

14. TRANSPORT INFORMATION

UN Number -DOT, IMDG, IATA	UN 3480 & UN 3481
Transport information	Lithium-ion Polymer Rechargeable Battery (Sample Model: ZN 123255) is tested and has passed in accordance with UN manual of Tests and Criteria, Part III, subsection 38.3. The goods shall be complied with the requirements of Section IB~II of Packing Instruction 965 or of Section II of Packing Instruction 966 & 967 of 61st DGR Manual of IATA or special provision 188 of IMDG CODE (Amdt. 39-18). Separate Lithium-ion batteries when shipping to prevent short-circuiting. They should be packed in strong packaging for support during transport, ensure that the goods will not falling, dropping, and breakage, prevent collapse of cargo piles and wet by rain. The transportation of primary lithium cells and batteries is regulated by the International Civil Aviation Organization, International Air Transport Association, International Maritime Dangerous Goods Code and the US Department of Transportation. The batteries must meet the following criteria for shipment: 1. Air shipments must meet the requirements listed in Special Provision A45 of the International Air Transport Association Dangerous Goods Regulations. 2. Meet the requirements for the US Department of Transportation listed in 49 CFR 173.185, 49 CFR 172.102. The transport of primary lithium batteries is prohibited aboard passenger aircraft. Refer to the Transportation of Dangerous Goods Act, 1992 (1992, c. 34) Lithium batteries shipped as "Lithium batteries", "Lithium batteries packed with equipment", or "Lithium batteries contained in equipment" may not be classified as "Dangerous Goods" when shipped in accordance with "special provision A45 of IATA-DGR" or "special provision 188 of IMO-IMDG Code".
Proper Shipping Name	Lithium ion Batteries (Including lithium ion polymer batteries) or; Lithium ion Batteries packed with equipment (Including lithium ion polymer batteries) or; Lithium ion Batteries contained in equipment (Including lithium ion polymer batteries)
TDG	Not regulated
DOT	
Hazard Class	9
Emergency Response Guide Number	147
MEX	Not regulated
ICAO	Not regulated
IATA	
Hazard Class	9
IMDG/IMO	
Hazard Class	9
EmS-No.	F-A, S-I

RID Not regulated

ADR Not regulated

ADN Not regulated

15. REGULATORY INFORMATION

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

International Regulations

The Montreal Protocol on Substances that Deplete the Ozone Layer Not applicable

The Stockholm Convention on Persistent Organic Pollutants Not applicable

The Rotterdam Convention Not applicable

CAS No.	TSCA	IECSC	DSLNDSL	EINECS/ELINCS/NLP
12190-79-3	Listed	Listed	Listed DSL	Listed
7782-42-5	Listed	Listed	Listed DSL	Listed
24937-79-9	Listed	Listed	Listed DSL	Listed
9003-55-8	Listed	Listed	Listed DSL	Listed
7440-50-8	Listed	Listed	Listed DSL	Listed
7429-90-5	Listed	Listed	Listed DSL	Listed

Legend
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances
IECSC -Inventory of existing chemical substances in China

16. OTHER INFORMATION

NFPA	**Health hazards** 1	**Flammability** 0	**Instability** 0	**Physical and Chemical Properties**
HMIS	**Health hazards** 0	**Flammability** 0	**Physical hazards** 0	**Personal Protection** X

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet