

SDS

SAFETY DATA SHEET

According to 2012 OSHA Hazard Communication Standard

(29 CFR 1910.1200)

Sample name: Li-ion Battery

Sample model: 18650-6700mAh

Applicant: Dongguan ARUN Industrial Co.,Ltd.

Date of issue: 2023.9.18

Written by *Chen Jie* Approved by *Duan Jiangtao*

Shenzhen Tiansu Calibration and Testing Co., Ltd.



* 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.

Section 1- Identification

(a) Product identifier

| | |
|--------------|----------------|
| Product name | Li-ion Battery |
|--------------|----------------|

(b) Other means of identification

| | |
|---------------------|---------------------------|
| Product description | Model: 18650-6700mAh |
| | Nominal Voltage: 3.6V |
| | Nominal capacity: 6700mAh |
| | Watt-hour: 24.12Wh |
| | Weight: 105.000g |

(c) Recommended use of the chemical and restrictions on use

| | |
|-----------------|-----------------------|
| Recommended use | LITHIUM ION BATTERIES |
|-----------------|-----------------------|

| | |
|----------------------|---------------------------|
| Uses advised against | No information available. |
|----------------------|---------------------------|

(d) Details of the supplier of the safety data sheet

| | |
|---------------|-----------------------------------|
| Supplier Name | Dongguan ARUN Industrial Co.,Ltd. |
|---------------|-----------------------------------|

| | |
|------------------|---|
| Supplier Address | NO.13,Xinfeng Street, Changlong,Huangjiang Town, Dongguan City,Guangdong Province, P.R.China |
|------------------|---|

| | |
|---------------------|-----------------------------------|
| Manufacture Company | Dongguan ARUN Industrial Co.,Ltd. |
|---------------------|-----------------------------------|

| | |
|---------------------|---|
| Manufacture Address | NO.13,Xinfeng Street, Changlong,Huangjiang Town, Dongguan City,Guangdong Province, P.R.China |
|---------------------|---|

| | |
|-----------------------|--------------|
| Supplier Phone Number | 0769-8293720 |
|-----------------------|--------------|

(e) Emergency telephone number

0769-8293720

Section 2- Hazards identification

(a) Classification

This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). This product is an article which is a sealed battery and as such does not require an MSDS per the OSHA hazard communication standard unless ruptured. The hazards indicated are for a ruptured battery.



| | |
|--|---|
| Reproductive toxicity | Category 2 |
| Acute toxicity-Oral | Category 3 |
| Skin corrosion/ irritation | Category 1 |
| Specific target organ toxicity-repeated exposure | Category 1 |
| (b) GHS Label elements, including precautionary statements | |
| Emergency Overview | |
| Signal word | Danger |
| Hazard Statements Suspected of damaging fertility or the unborn child Toxic if swallowed Causes severe skin burns and eye damage Cause damage to organs through prolonged or repeated exposure. | |
|  | |
| Appearance: | No information available |
| Physical State: | Solid |
| Odor: | No information available |
| P101 | If medical advice is needed,,have product containet or label at hand |
| P201 | Obtain special instructions before use. |
| P202 | Do not handle until all safety precautions have been read and understood. |
| P260 | Do not breathe dust/fume/gas/mist/vapours/spray. |
| P264 | Wash ... thoroughly after handling. |
| P270 | dust/fume/gas/mist/vapours/spray |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection |



| | |
|----------------|--|
| P308+P313 | IF exposed or concerned: Get medical advice/ attention. |
| P301+P310 | IF SWALLOWED: Immediately call a POISON CENTER/doctor/02026. |
| P321 | Specific treatment (see ... on this label). |
| P330 | Rinse mouth. |
| P301+P330+P331 | IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. |
| P303+P361+P353 | IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]. |
| P363 | Wash contaminated clothing before reuse. |
| P304+P340 | IF INHALED: Remove person to fresh air and keep comfortable for breathing. |
| P310 | Immediately call a POISON |
| P305+P351+P338 | CENTER/doctor/02026 |
| P314 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| | Get medical advice/attention if you feel unwell. |
| P405 | Store locked up. |
| P501 | Dispose of contents/container to ... |

(c) Hazards not otherwise classified (HNOC)

Not applicable

(d) Unknown Toxicity

32% of the mixture consists of ingredient(s) of unknown toxicity

(e) Other information

Very toxic to aquatic life with long lasting effects

(f) Interactions with Other Chemicals

No information available.

Section 3- Composition/information on ingredients

| Chemical Name | CAS Number | Weight (%) | Trade Secret |
|---------------------------------|-------------|------------|--------------|
| Lithium nickel cobalt aluminate | 177997-13-6 | 37.9-39.1 | * |
| Graphite | 7782-42-5 | 16.2-16.7 | * |
| SiO | 10097-28-6 | 1.60-1.65 | * |



| | | | | |
|---------------|--|------------|-----------|---|
| Copper foil | | 7440-50-8 | 8.3-8.56 | * |
| Aluminum foil | | 7429-90-5 | 3.48-3.59 | * |
| Electrolyte | C ₃ H ₄ O ₃ | 96-49-1 | 1-1.1 | * |
| | C ₄ H ₈ O ₃ | 623-53-0 | 0.65-0.66 | * |
| | C ₃ H ₆ O ₃ | 616-38-6 | 5.92-6.11 | * |
| | LiPF ₆ | 21324-40-3 | 1.51-1.55 | * |
| Separator | | 9002-88-4 | 1.23-1.26 | * |

" * " The exact percentage (concentration) of composition has been withheld as a trade secret.

Section 4- First-aid measures

Description of first aid measures

- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Immediately rinse with water.
- **After eye contact:** Rinse opened eye for several minutes under running water. Then consult a doctor.
- **After swallowing:** If symptoms persist consult doctor.
- **Most important symptoms and effects, both acute and delayed** No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

Section 5- Fire-fighting measures

(a) Suitable Extinguishing Media

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

(b) Unsuitable extinguishing media

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

(c) 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.

(d) Hazardous Combustion Products

Carbon oxides.

(e) Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

Section 6- Accidental release measures

(a) Personal precautions, protective equipment and emergency procedures

If the battery is released, remove personnel from area until fumes dissipate. Provide maximum ventilation to clear out hazardous gases. The preferred response is to leave the area and allow the vapors to dissipate. Avoid skin and eyes contact or inhalation of vapors. Remove spilled liquid with absorbent and incinerated. If leakage of the battery happens, liquid could be absorbed with sand, earth or other inert substance and contaminated area should be ventilated meantime.



(b) Environment precautions

Do not allow product to reach sewage system or any water source.
 Inform respective authorities in case of seepage into water course or sewage system.
 Do not allow to enter sewers surface or ground water.

(c) Methods and material for containment and cleaning up

If battery casing is dismantled, small amounts of electrolyte may leak. Collect all released material in a plastic lined container. Dispose off according to the local law and rules. Avoid leached substances to get into the earth, canalization or waters.

Section 7- Handling and storage

(a) Precautions for safe handling
Handling

Handle in accordance with good industrial hygiene and safety practice. Wear personal protective equipment. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash before reuse.

(b) Conditions for safe storage, including any incompatibilities
Storage

Keep containers tightly closed in a dry, cool and well-ventilated place. Store locked up. Keep out of the reach of children.

Incompatible Products

Strong acids. Strong oxidizing agents. Strong bases

Section 8- Exposure controls/personal protection

(a) Control parameters

| Chemical Name | ACGIH TLV | OSHA PEL | NIOSH IDLH |
|---|--|---|--|
| Graphite 7782-42-5 | TWA: 3 mg/m ³ inhalable fraction | TWA: 3.5 mg/m ³ (vacated) TWA: 3.5 mg/m ³ | IDLH: 1750 mg/m ³ TWA: 3.5 mg/m ³ TWA: 0.1 mg/m ³ Graphite in presence of Polycyclic aromatic hydrocarbons PAH |
| Lithium nickel cobalt aluminate 177997-13-6 | TWA: 0.02 mg/m ³ | - | - |
| Phosphate(1-), hexafluoro-, lithium 21324-40-3 | TWA: 2.5 mg/m ³ F | TWA: 2.5 mg/m ³ F TWA: 2.5 mg/m ³ dust (vacated) TWA: 2.5 mg/m ³ | |
| Copper 7440-50-8 | TWA: 0.2 mg/m ³ fume TWA: 1 mg/m ³ Cu dust and mist | TWA: 0.1 mg/m ³ fume TWA: 1 mg/m ³ dust and mist (vacated) | IDLH: 100 mg/m ³ dust, fume and mist TWA: 1 mg/m ³ dust and |



| | | | |
|----------------------------|--|--|---|
| | | TWA:0.1mg/m ³ Cu dust,fume,mist | mist TWA:0.1mg/m ³ fume |
| Aluminum foil 7429-90-5 | TWA:1mg/m ³ respirable fraction | TWA:15mg/m ³ total dust TWA:5mg/m ³ respirable fraction (vacated) TWA:15mg/m ³ total dust (vacated) TWA:5mg/m ³ respirable fraction(vacated) TWA:5mg/m ³ AL Aluminum | TWA:10mg/m ³ total dust TWA:5mg/m ³ respirable dust |

ACGIH TLV: American Conference of Governmental Industrial Hygienists - Threshold Limit Value

OSHA PEL: Occupational Safety and Health Administration - Permissible Exposure Limits Immediately Dangerous to Life or Health

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

(b) Appropriate engineering controls

Engineering Measures Showers
Eyewash stations
Ventilation systems

(c) Individual protection measures, such as personal protective equipment

| | |
|---------------------------------|--|
| Eye/Face Protection | None required for consumer use. If there is a risk of contact:. Tight sealing safety goggles. Face protection shield. |
| Skin and body Protection | None required for consumer use. If there is a risk of contact:. Wear protective gloves and protective clothing. |
| 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. |
| Hygiene Measures | Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash before reuse. Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. 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. For environmental protection, remove and wash all contaminated protective equipment before re-use. No information available. |

Section 9- Physical and chemical properties

| | |
|--------------|---------------|
| Form | Solid |
| Color | Blue |
| Odor | Not Available |



| | |
|---|---|
| pH | Not Available |
| Melting point/freezing point | Not Available |
| Boiling Point and Boiling range | Not Available |
| Flash Point | Not Available |
| Upper/lower flammability or explosive limits | Not Available |
| Vapor Pressure | Not Available |
| Vapor Density | Not Available |
| Relative density | Not Available |
| Solubility in Water | Not Available |
| Auto-ignition temperature | Not Available |
| Decomposition temperature | Not Available |
| Evaporation rate | Not Available |
| Flammability (soil, gas) | Not Available |
| Viscosity | Not Available |
| Section 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. Excessive heat. |
| Incompatible materials | Acids. Bases. Oxidizing agent. |
| Hazardous Decomposition Products | Carbon oxides. |
| Section 11 – Toxicological information | |



| | | | | |
|--|---|---------------------|-----------------|------|
| Product Information | Product does not present an acute toxicity hazard based on known or supplied information. In case of rupture: | | | |
| 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. | | | |
| 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. | | | |
| Component Information | | | | |
| Chemical Name | Oral LD50 | Dermal LD50 | Inhalation LC50 | |
| Graphite 7782-42-5 | > 10000 mg/kg (Rat) | > 3 g/kg (Rabbit) | - | |
| Information on toxicological effects | | | | |
| Symptoms | Erythema (skin redness). May cause redness and tearing of the eyes. Itching. Rashes. Hives. | | | |
| Delayed and immediate effects as well as chronic effects from short and long-term exposure | | | | |
| Sensitization: | May cause sensitization of susceptible persons. May cause sensitization by skin contact. | | | |
| Mutagenic Effects: | No information available. | | | |
| Carcinogenicity: | The table below indicates whether each agency has listed any ingredient as a carcinogen. | | | |
| Chemical Name | ACGIH | IARC | NTP | OSHA |
| Lithium nickel cobalt aluminate 177997-13-6 | A3 | Group 2B | | X |
| Graphite 7782-42-5 | A3 | Group 2B | | X |
| ACGIH (American Conference of Governmental Industrial Hygienists) <i>A3 - Animal Carcinogen</i> IARC (International Agency for Research on Cancer) <i>Group 2B - Possibly Carcinogenic to Humans</i> OSHA (Occupational Safety and Health Administration of the US Department of Labor) <i>X - Present</i> | | | | |



| | |
|---------------------------------|--|
| Reproductive Toxicity | No information available. |
| STOT - single exposure | No information available. |
| STOT - repeated exposure | Causes damage to organs through prolonged or repeated exposure. Based on classification criteria from the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200), this product has been determined to cause systemic target organ toxicity from chronic or repeated exposure. (STOT RE). |
| Chronic Toxicity | Contains a known or suspected carcinogen. Avoid repeated exposure. Prolonged exposure may cause chronic effects. May cause adverse liver effects. |
| Target Organ Effects | Respiratory system. Eyes. Skin. Gastrointestinal tract (GI). Central Vascular System (CVS).Kidney. Liver. Liver. Cardiovascular system. Systemic Toxicity. |
| Aspiration Hazard | No information available. |

Numerical measures of toxicity Product Information

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

| | |
|-------------------------|-----------------------|
| ATEmix (oral): | 12,905.00 mg/kg |
| ATEmix (dermal): | 10,200.00 mg/kg (ATE) |

Section 12- Ecological information

| Ecological Toxicity | | Very toxic to aquatic life with long lasting effects. | | |
|----------------------------|---|--|----------------------------|----------------------------|
| Chemical name | Toxicity to Algae | Toxicity to Fish | Toxicity to Microorganisms | Daphnia Magna (Water Flea) |
| Copper 7440-50-8 | 96h EC50: 0.031 - 0.054 mg/L (Pseudokirchneriella subcapitata) 72h EC50: 0.0426 - 0.0535 mg/L (Pseudokirchneriella subcapitata) | 96h LC50: 0.0068 - 0.0156 mg/L (Pimephales promelas) 96h LC50: = 0.112 mg/L (Poecilia reticulata) 96h LC50: = 0.3 mg/L (Cyprinus carpio) 96h LC50: = 0.8 mg/L (Cyprinus carpio) 96h LC50: = 1.25 mg/L (Lepomis macrochirus) 96h LC50: = 0.052 mg/L (Oncorhynchus mykiss) 96h LC50: = 0.2 mg/L (Pimephales promelas) 96h LC50: < 0.3 mg/L (Pimephales promelas) | | 48h EC50: = 0.03 mg/L |



| | | | |
|--------------------------------------|---------------------------|--|-----------------------|
| Graphite 7782-42-5 | | | 24h EC50: > 5600 mg/L |
| Persistence and Degradability | No information available. | | |
| Bioaccumulation | No information available. | | |
| Other adverse effects | No information available. | | |

Section 13- Disposal considerations

Waste treatment methods

| | |
|-------------------------------|---|
| Disposal methods | This material, as supplied, is not a hazardous waste according to Federal regulations (40 CFR 261). This material could become a hazardous waste if it is mixed with or otherwise comes in contact with a hazardous waste, if chemical additions are made to this material, or if the material is processed or otherwise altered. Consult 40 CFR 261 to determine whether the altered material is a hazardous waste. Consult the appropriate state, regional, or local regulations for additional requirements. |
| Contaminated Packaging | Disposal should be in accordance with applicable regional, national and local laws and regulations. |

California Hazardous Waste Codes 141

This product contains one or more substances that are listed with the State of California as a hazardous waste.

| Chemical Name | California Hazardous Waste |
|--|----------------------------|
| Lithium nickel cobalt aluminate 177997-13-6 | Toxic |
| Copper 7440-50-8 | Toxic |
| Aluminum foil 7429-90-5 | Ignitable powder |

Section 14 – Transport information

| | |
|--|---|
| UN Number -DOT, IMDG, IATA | UN 3480 & UN 3481 |
| UN Proper shipping name -DOT, IMDG, IATA | Lithium ion Batteries (Including lithium ion polymer batteries) or ; Lithium ion Batteries contained in equipments (Including lithium ion polymer batteries) or; Lithium ion Batteries packed with equipment (Including lithium ion polymer batteries) |
| Transport information | Li-ion Battery (Sample Model: 18650-6700mAh) is tested and has passed in accordance with UN manual of Tests and Criteria, Part III, subsection 38.3. The transportation of lithium cells and batteries is regulated by the International Air Transport Association (According to Section IB of PACKING INSTRUCTION 965, or to Section II of PACKING INSTRUCTION 966~967 of IATA DGR 64 th Edition for transportation), International Civil Aviation Organization, International Maritime Dangerous Goods Code and the US Department of Transportation listed in 49 CFR 173.185. |



| | |
|--|---|
| | 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" |
| Transport hazard class(es) -DOT, IMDG, IATA | 9 |
| Environmental hazards | Yes(DOT) |
| Marine pollutant | Symbol (fish and tree) |
| Special precautions for user EMS Number | Warning: Miscellaneous dangerous substances and articles F-A,S-N |
| Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code | Not applicable |
| DOT Remarks: | Special marking with the symbol (fish and tree) |
| IMDG Limited quantities (LQ) Excepted quantities (EQ) | 0 Code: E0 Not permitted as Excepted Quantity |

Section 15- Regulatory information

(a) International Inventories

| | |
|-------------|--|
| TSCA | Complies. |
| DSL | All components are listed either on the DSL or NDSL. |

(b) US Federal Regulations

| | | | |
|---------------------------------|--|-----------------|--------------------------------------|
| SARA 313 | Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372. | | |
| Chemical Name | CAS No | Weight-% | SARA 313 – Threshold Values % |
| Lithium nickel cobalt aluminate | 177997-13-6 | 15-40 | 0.1 |
| Copper | 7440-50-8 | 3-7 | 1.0 |
| Aluminum foil | 7429-90-5 | 7-13 | 1.0 |

SARA 311/312 Hazard Categories

| | |
|-----------------------------------|----|
| Acute Health Hazard | No |
| Chronic Health Hazard | No |
| Fire Hazard | No |
| Sudden release of pressure hazard | No |



| | | | | | |
|--|-----------------------------|--|---|---|----------|
| Reactive Hazard | | No | | | |
| CWA (Clean Water Act) | | This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42) | | | |
| Chemical Name | CWA - Reportable Quantities | CWA - Toxic Pollutants | CWA - Priority Pollutants | CWA - Hazardous Substances | |
| Copper 7440-50-8 | | X | X | | |
| CERCLA | | This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) | | | |
| Chemical Name | Hazardous Substances RQs | Extremely Hazardous Substances RQs | | RQ | |
| Copper 7440-50-8 | 5000 lb | | | RQ 5000 lb final RQ RQ 2270 kg final RQ | |
| (c) US State Regulations | | | | | |
| California Proposition 65 | | | This product contains the following Proposition 65 chemicals. | | |
| Chemical name | | | California Proposition 65 | | |
| Graphite – 7782-42-5 | | | Carcinogen | | |
| U.S. State Right-to-Know Regulations | | | | | |
| Chemical Name | New Jersey | Massachusetts | Pennsylvania | Rhode Island | Illinois |
| Graphite 7782-42-5 | X | X | X | | X |
| Lithium nickel cobalt aluminate 177997-13-6 | X | | X | X | X |
| Aluminum 7429-90-5 | X | X | X | X | |
| Copper 7440-50-8 | X | X | X | X | X |
| (d) International Regulations | | | | | |
| Mexico | | | | | |
| National occupational exposure limits | | | | | |
| Component | | Carcinogen Status | | Exposure Limits | |
| Graphite 7782-42-5 (15 - 40) | | | | Mexico: TWA=3.5 mg/m ³ | |
| Aluminum 7429-90-5 (7 - 13) | | | | Mexico: TWA= 10 mg/m ³ | |
| Copper 7440-50-8 (3 - 7) | | | | Mexico: TWA= 1 mg/m ³ Mexico: TWA= 0.2 mg/m ³ Mexico: STEL= 2 mg/m ³ | |
| <i>Mexico - Occupational Exposure Limits - Carcinogens</i> | | | | | |
| Canada | | | | | |



| | |
|---------------------------|----------------|
| WHMIS Hazard Class | Not determined |
|---------------------------|----------------|

Section 16- Other information

| | | | | | | | | |
|-------------|-----------------------|----|---------------------|---|------------------------|---|--------------------------------------|---|
| NFPA | Health Hazards | 1 | Flammability | 0 | Instability | 0 | Physical and Chemical Hazards | - |
| HMIS | Health Hazards | 2* | Flammability | 0 | Physical Hazard | 0 | Personal Protection | X |

Chronic Hazard Star Legend * = Chronic Health Hazard

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 Report --

