

# 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
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### (b) Other means of identification

Product description	Model: 18650-6700mAh Nominal Voltage: 3.6V Nominal capacity: 6700mAh Watt-hour: 24.12Wh Weight: 105.000g
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### (c) Recommended use of the chemical and restrictions on use

Recommended use	LITHIUM ION BATTERIES
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Uses advised against	No information available.
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### (d) Details of the supplier of the safety data sheet

Supplier Name	Dongguan ARUN Industrial Co.,Ltd.
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Supplier Address	NO.13,Xinfeng Street, Changlong,Huangjiang Town, Dongguan City,Guangdong Province, P.R.China
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Manufacture Company	Dongguan ARUN Industrial Co.,Ltd.
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Manufacture Address	NO.13,Xinfeng Street, Changlong,Huangjiang Town, Dongguan City,Guangdong Province, P.R.China
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Supplier Phone Number	0769-8293720
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### (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>(b) GHS Label elements, including precautionary statements</b>	
Emergency Overview	
<b>Signal word</b>	Danger
<b>Hazard Statements</b> 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.	
	
<b>Appearance:</b>	No information available
<b>Physical State:</b>	Solid
<b>Odor:</b>	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/2026.
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/2026
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 <sub>3</sub> H <sub>4</sub> O <sub>3</sub>	96-49-1	1-1.1	*
	C <sub>4</sub> H <sub>8</sub> O <sub>3</sub>	623-53-0	0.65-0.66	*
	C <sub>3</sub> H <sub>6</sub> O <sub>3</sub>	616-38-6	5.92-6.11	*
	LiPF <sub>6</sub>	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 <sup>3</sup> inhalable fraction	TWA: 3.5 mg/m <sup>3</sup> (vacated) TWA: 3.5 mg/m <sup>3</sup>	IDLH: 1750 mg/m <sup>3</sup> TWA: 3.5 mg/m <sup>3</sup> TWA: 0.1 mg/m <sup>3</sup> Graphite in presence of Polycyclic aromatic hydrocarbons PAH
Lithium nickel cobalt aluminate 177997-13-6	TWA: 0.02 mg/m <sup>3</sup>	-	-
Phosphate(1-), hexafluoro-, lithium 21324-40-3	TWA:2.5mg/m <sup>3</sup> F	TWA:2.5mg/m <sup>3</sup> F TWA:2.5mg/m <sup>3</sup> dust (vacated)TWA:2.5mg/m <sup>3</sup>	
Copper 7440-50-8	TWA:0.2mg/m <sup>3</sup> fume TWA:1mg/m <sup>3</sup> Cu dust and mist	TWA:0.1mg/m <sup>3</sup> fume TWA:1mg/m <sup>3</sup> dust and mist (vacated)	IDLH:100mg/m <sup>3</sup> dust ,fume and mist TWA:1mg/m <sup>3</sup> dust and



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

<b>Form</b>	Solid
<b>Color</b>	Blue
<b>Odor</b>	Not Available



<b>pH</b>	Not Available
<b>Melting point/freezing point</b>	Not Available
<b>Boiling Point and Boiling range</b>	Not Available
<b>Flash Point</b>	Not Available
<b>Upper/lower flammability or explosive limits</b>	Not Available
<b>Vapor Pressure</b>	Not Available
<b>Vapor Density</b>	Not Available
<b>Relative density</b>	Not Available
<b>Solubility in Water</b>	Not Available
<b>Auto-ignition temperature</b>	Not Available
<b>Decomposition temperature</b>	Not Available
<b>Evaporation rate</b>	Not Available
<b>Flammability (soil, gas)</b>	Not Available
<b>Viscosity</b>	Not Available
<b>Section 10- Stability and reactivity</b>	
<b>Reactivity</b>	No information available.
<b>Chemical stability</b>	Stable under normal conditions.
<b>Possibility of Hazardous Reactions</b>	None under normal processing.
<b>Hazardous Polymerization</b>	Hazardous polymerization does not occur.
<b>Conditions to avoid</b>	Exposure to air or moisture over prolonged periods. Excessive heat.
<b>Incompatible materials</b>	Acids. Bases. Oxidizing agent.
<b>Hazardous Decomposition Products</b>	Carbon oxides.
<b>Section 11 – Toxicological information</b>	



<b>Product Information</b>	Product does not present an acute toxicity hazard based on known or supplied information. In case of rupture:			
<b>Eye contact</b>	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.			
<b>Skin contact</b>	Specific test data for the substance or mixture is not available. Corrosive. (based on components). Causes burns.			
<b>Ingestion</b>	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.			
<b>Component Information</b>				
Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50	
Graphite 7782-42-5	> 10000 mg/kg ( Rat )	> 3 g/kg ( Rabbit )	-	
<b>Information on toxicological effects</b>				
<b>Symptoms</b>	Erythema (skin redness). May cause redness and tearing of the eyes. Itching. Rashes. Hives.			
<b>Delayed and immediate effects as well as chronic effects from short and long-term exposure</b>				
<b>Sensitization:</b>	May cause sensitization of susceptible persons. May cause sensitization by skin contact.			
<b>Mutagenic Effects:</b>	No information available.			
<b>Carcinogenicity:</b>	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
<b>ACGIH (American Conference of Governmental Industrial Hygienists)</b> A3 - Animal Carcinogen <b>IARC (International Agency for Research on Cancer)</b> Group 2B - Possibly Carcinogenic to Humans <b>OSHA (Occupational Safety and Health Administration of the US Department of Labor)</b> X - Present				



<b>Reproductive Toxicity</b>	No information available.
<b>STOT - single exposure</b>	No information available.
<b>STOT - repeated exposure</b>	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).
<b>Chronic Toxicity</b>	Contains a known or suspected carcinogen. Avoid repeated exposure. Prolonged exposure may cause chronic effects. May cause adverse liver effects.
<b>Target Organ Effects</b>	Respiratory system. Eyes. Skin. Gastrointestinal tract (GI). Central Vascular System (CVS).Kidney. Liver. Liver. Cardiovascular system. Systemic Toxicity.
<b>Aspiration Hazard</b>	No information available.

**Numerical measures of toxicity Product Information**

<b>The following values are calculated based on chapter 3.1 of the GHS document</b>	<b>ATEmix (oral):</b>	12,905.00 mg/kg
	<b>ATEmix (dermal):</b>	10,200.00 mg/kg (ATE)

**Section 12- Ecological information**

<b>Ecological Toxicity</b>		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
<b>Persistence and Degradability</b>		No information available.	
<b>Bioaccumulation</b>		No information available.	
<b>Other adverse effects</b>		No information available.	

### Section 13- Disposal considerations

<b>Waste treatment methods</b>	
<b>Disposal methods</b>	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.
<b>Contaminated Packaging</b>	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

<b>UN Number</b> -DOT, IMDG, IATA	UN 3480 & UN 3481
<b>UN Proper shipping name</b> -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)
<b>Transport information</b>	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 <sup>th</sup> 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"
<b>Transport hazard class(es) -DOT, IMDG, IATA</b>	9
<b>Environmental hazards</b>	Yes(DOT)
<b>Marine pollutant</b>	Symbol (fish and tree)
<b>Special precautions for user EMS Number</b>	Warning: Miscellaneous dangerous substances and articles F-A,S-N
<b>Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</b>	Not applicable
<b>DOT Remarks:</b>	Special marking with the symbol (fish and tree)
<b>IMDG Limited quantities (LQ) Excepted quantities (EQ)</b>	0 Code: E0 Not permitted as Excepted Quantity

### Section 15- Regulatory information

#### (a) International Inventories

<b>TSCA</b>	Complies.
<b>DSL</b>	All components are listed either on the DSL or NDSL.

#### (b) US Federal Regulations

<b>SARA 313</b>	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.
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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			
<b>CWA (Clean Water Act)</b>		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		
<b>CERCLA</b>		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	
<b>(c) US State Regulations</b>					
<b>California Proposition 65</b>			This product contains the following Proposition 65 chemicals.		
Chemical name			California Proposition 65		
Graphite – 7782-42-5			Carcinogen		
<b>U.S. State Right-to-Know Regulations</b>					
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
<b>(d) International Regulations</b>					
<b>Mexico</b>					
<b>National occupational exposure limits</b>					
Component		Carcinogen Status		Exposure Limits	
Graphite 7782-42-5 ( 15 - 40 )				Mexico: TWA=3.5 mg/m <sup>3</sup>	
Aluminum 7429-90-5 ( 7 - 13 )				Mexico: TWA= 10 mg/m <sup>3</sup>	
Copper 7440-50-8 ( 3 - 7 )				Mexico: TWA= 1 mg/m <sup>3</sup> Mexico: TWA= 0.2 mg/m <sup>3</sup> Mexico: STEL= 2 mg/m <sup>3</sup>	
<i>Mexico - Occupational Exposure Limits - Carcinogens</i>					
<b>Canada</b>					





<b>WHMIS Hazard Class</b>	Not determined
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**Section 16- Other information**

<b>NFPA</b>	<b>Health Hazards</b>	1	<b>Flammability</b>	0	<b>Instability</b>	0	<b>Physical and Chemical Hazards</b>	-
<b>HMIS</b>	<b>Health Hazards</b>	2*	<b>Flammability</b>	0	<b>Physical Hazard</b>	0	<b>Personal Protection</b>	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 --

