Safety Data Sheet (SDS) for Kakadu-120-88.4

SECTION 1: Identification of the substance/mixture and of the Company/undertaking

GHS Product identifier:
Product Name: Rechargeable Li-ion Battery System
Model: Kakadu-120-88.4

Manufacturer Identification
Company: Zhuhai Great Power Energy Co., Ltd.
Address: No.2 Xinqing Fifth Road, Jing'An Town, Doumen District, 519100, Zhuhai City, Guangdong Province, P.R. China
Contact Information: info@greatpower.net
Emergency Contact: +86 020-39196888

Australia Importer
Company: AERL Pty Ltd
Address: 1/75 Bluestone Circuit, Seventeen Mile Rocks, QLD 4073, Australia
Contact Person Name: Peter Watkinson
Contact Person Number: +61 1800 950 865
Contact Person E-mail: support@aerl.com.au

Emergency phone number
Poisons Information Centre: 13 11 26 (24 hours, Australia-wide)

SECTION 2: Hazards identification

2.1. Classification of the hazardous chemical
According to this Safety Data Sheet (SDS), lithium-ion batteries are securely sealed and considered safe when used as intended, presenting no risk of ignition, explosion, or hazardous leakage under normal operating conditions. Potential hazards may arise only in cases of mechanical, thermal, or electrical abuse or damage.
Not classified as hazardous under WHS Regulations.
Product is an article.

2.2. GHS Label elements, including precautionary statements
Hazard pictograms (GHS AU):

Hazard pictograms

Signal word: Danger

Hazard statements

AUH070: Toxic by eye contact.

AUH071: Corrosive to the respiratory tract.

H225: Highly flammable liquid and vapour

H302: Harmful if swallowed

Precautionary statements (GHS AU):

H314 - Causes severe skin burns and eye damage

H372 - Causes damage to organs through prolonged or repeated exposure

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233 - Keep container tightly closed.

P240 - Ground and bond container and receiving equipment.

P241 - Use explosion-proof equipment.

P260 - Do not breathe dust/fume/gas/mist/vapours/spray.

P264 - Wash hands, forearms and face thoroughly after handling.

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

P280 - Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.

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.

P363 - Wash contaminated clothing before reusing.

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

P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P310 - Immediately call a POISON CENTER or doctor.

P403+P235 - Store in a well-ventilated place. Keep cool.

P405 - Store locked up.

P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

Medical Conditions Generally Aggravated by Exposure:

An acute exposure will not generally aggravate any medical condition.

Human health effects:

- **Inhalation:** The vapour of the electrolyte has an anaesthetic action and irritates the respiratory tract.
- **Skin contact:** The vapour of the electrolyte irritates skin. Electrolyte skin contacts cause soreness and irritation to the skin.

- **Eye contact:** The vapour of the electrolyte irritates the eyes. Electrolyte eye contact causes soreness and irritation to the eyes. Inflammation of the eyes may occur.

Environmental effects:
Battery cells persist in the environment. Do not dispose of batteries in the environment.

Specific hazards:
If the electrolyte contacts water, it may generate detrimental hydrogen fluoride. Since the leaked electrolyte is a flammable liquid, do not bring it close to fire.

2.3. Other hazards which do not result in classification
No additional information available

SECTION 3: Composition/information on ingredients

Hazardous components	Content / wt%	CAS No.	Classification according to WHS Regulations
Lithium Iron Phosphate Carbon Coated	38.86	15365-14-7	--
Graphite	18.20	7782-42-5	--
Ethylene Carbonate	6.86	96-49-1	--
Methyl Ethyl Carbonate	1.14	623-53-0	--
Diethyl Carbonate	9.15	105-58-8	--
Propylene Carbonate	2.86	108-32-7	--
LiPF6	2.29	21324-40-3	--
Polypropylene	4.20	9003-07-0	--
Copper	1.68	7440-50-8	--
Aluminum	14.76	7429-90-5	--

Comments: The concentrations listed represent actual ranges that result from batch variability.

SECTION 4: First Aid Measures

4.1 Description of first aid measures
General information:
In normal cases no specific measures are needed.
It always applies:
In case of discomfort or doubt, seek medical advice.
If unconscious, use a stable lateral position and do not administer anything through mouth.

The following measures apply to contact with the contents of a damaged battery:
After inhalation:
Supply fresh air; consult doctor in case of complaints.
In case of unconsciousness place patient stably in side position for transportation.
After skin contact:

Immediately wash with water and soap and rinse thoroughly. Take off contaminated clothing and wash it before reusing. Seek medical treatment in case of complaints.

After eye contact:

Rinse eyes open for several minutes under running water. Remove contact lenses, if present and easy to do. Continue rinsing. Consult an ophthalmologist or eye clinic immediately.

After swallowing:

Rinse mouth thoroughly with cold water. Do not induce vomiting. If the patient is fully conscious, give one or two glasses of water to drink. Get medical attention immediately.

All listed health effects apply only in case of damaged or leaking batteries.

4.2 Most important symptoms and effects, caused by exposure.

Symptoms/effects after inhalation:

Causes burns to the respiratory system.

Symptoms/effects after skin contact:

Causes severe skin burns. Symptoms may include redness, pain, blisters.

Symptoms/effects after eye contact:

Causes serious eye damage. Symptoms may include discomfort or pain, excess blinking and tear production, with marked redness and swelling of the conjunctiva. May cause burns.

Symptoms/effects after ingestion:

Harmful if swallowed. May cause gastrointestinal irritation, nausea, vomiting and diarrhea. May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract.

Chronic symptoms:

Causes damage to organs through prolonged or repeated exposure.

4.3 Indication of any immediate medical attention and special treatment needed.

Depending on the condition of the patients, the doctor must assess the symptoms and the overall general condition.

SECTION 5: Firefighting Measures

5.1 Extinguishing media

Suitable extinguishing agents:

CO2, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

For safety reasons unsuitable extinguishing agents: Water with full jet.

5.2. Specific hazards arising from the chemical

Fire hazard:

Products of combustion may include and are not limited to: carbon oxides. Highly flammable liquid and vapour. Corrosive vapours.

Explosion hazard:

May form flammable/explosive vapour-air mixture.

General measures:

Remove all sources of ignition. Use special care to avoid static electric charges. Use personal protection

recommended in Section 8. Isolate the hazard area and deny entry to unnecessary and unprotected personnel.

5.3. Special protective equipment and precautions for fire-fighters

Firefighting instructions:

Move containers away from the fire area if this can be done without risk. Cool closed containers exposed to fire with water spray. Ensure good ventilation.

Protection during firefighting: Keep upwind of fire. Wear full firefighting turn-out gear (full Bunker gear) and respiratory protection (SCBA).

Hazchem Code: 2Y.

SECTION 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

- Restricted access to the affected area until cleaning work is completed.
- Wear protective equipment. Keep unprotected people away.
- Ensure adequate ventilation
- Avoid skin and eye contact with damaged batteries.
- Do not breathe dust/fume/gas/mist/vapours/spray.

6.2 Environmental precautions:

Do not allow sewers, surface water or groundwater.

6.3 Methods and material for containment and cleaning up:

If the battery is damaged:

Cover leaked material with inert absorbent material (sand or soil) and dispose of in suitable containers.

Clean again: Sweep or shovel spills into appropriate container for disposal.

Ensure adequate ventilation.

If the battery pack is in water, there is a risk of a weak electric shock. When the water is electrolyzed, hydrogen is produced. Good ventilation must be ensured to prevent the concentration of hydrogen and an explosion of hydrogen in the enclosed space as a result. If possible, remove the battery or battery pack from the water and inform the local police.

6.4 Reference to other sections

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

SECTION 7: Handling and Storage

7.1 Precautions for safe handling

- In any case, the warnings on batteries and the instructions for use of devices and other applications must be carefully observed.
- Use only the recommended battery types.
- Lithium-ion batteries should preferably be stored at room temperature and dry (max. 40°C), large temperature fluctuations should be avoided. (e.g. do not store near heaters, do not permanently

expose to sunlight).
- Never open, mechanically damage or burn the battery!
- One of the most important risks when transporting batteries and battery-powered equipment is the short circuit of the battery caused by the contact of the two poles of the battery with other batteries, metal objects or other electrical conductors. Therefore, the packaged battery (cells) and batteries must be adequately separated to prevent short circuits and electrode damage.
- Do not allow broken battery cells to come into contact with water. When handling battery packs of over 50V, the operating personnel require appropriate insulation protection.
- Observe protective measures and safety instructions.

Information about fire and explosion protection:
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

7.2 Conditions for safe storage, including any incompatibilities
Storage:
Requirements to be met by storerooms and receptacles:
- Store in dry conditions.
- Store in a cool location.
- Protect from heat and direct sunlight.
- Store in accordance with local/regional/national/international regulations.

Information about storage in one common storage facility:
- Store away from oxidizing agents.
- Do not store together with acids.

Further information about storage conditions: Store in original container.
Recommended storage temperature:
- Room temperature
- Longer storage with a load capacity between 25 and 75 %.

7.3 Specific end use(s): No further relevant information available.

SECTION 8: Exposure Controls/Personal Protection

8.1. Control parameters - exposure standards
Lithium-ion batteries are products from which no substances are released under normal and reasonably foreseeable conditions of use.

Phosphate (1-), hexafluoro-, lithium (21324-40-3)	
WES - Occupational Exposure Limits	
ACGIH OEL TWA	2.5 mg/m³ (as Fluorides, RR-02792-9)

8.2. Individual protection measures, such as personal protective equipment (PPE)
Appropriate engineering controls
- No further data; see section 7.
- Technical measures and the use of suitable working methods take priority over the use of personal protective equipment.

Individual protection measures, such as personal protective equipment

Generally protective and hygienic measures:

- The usual precautionary measures are to be adhered to when handling chemicals.
- Keep away from foodstuffs, beverages and feed.
- Do not eat or drink while working.
- Avoid skin and eye contact with damaged batteries.
- Avoid inhalation of spilled material.
- Take off contaminated clothing and wash it before reusing.
- Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of the hazardous substances handled. The chemical resistance of the protective equipment should be confirmed with the respective supplier.
- Eye wash bottles and emergency showers should be provided in the immediate area near the workplace.

Respiratory protection:

Not required when handling undamaged batteries.

Hand protection

- Not required when handling undamaged batteries.
- Wear protective gloves made of chloroprene or rubber if batteries are damaged.

Material of gloves

- The selection of suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
- Selection of the glove material on consideration of the penetration rates of diffusion and the degradation.

Penetration time of glove material

- The exact breakthrough time must be found out by the manufacturer of the protective gloves and must be observed.

Eye/face protection

- Not required when handling undamaged batteries.
- Wear protective goggles if batteries are damaged.

Body protection:

- Not required when handling undamaged batteries.

Environmental exposure controls: Do not allow to enter sewers, surface water or groundwater.

SECTION 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

General Information	
Physical state	Solid
Colour:	Grey
Odour:	Odourless
Odour threshold:	No information available.
Melting point/freezing point:	No information available.
pH	Not applicable.
pH solution	Not applicable.
Boiling point or initial boiling point and boiling range	No information available.

Flammability	Not determined.
Lower explosion limit	No information available.
Upper explosion limit	No information available.
Flash point:	Not applicable.
Decomposition temperature:	No information available.
Viscosity:	
Kinematic viscosity	Not applicable.
Dynamic:	Not applicable.
Solubility	
water:	Insoluble.
Partition coefficient n-octanol/water (log value)	No information available.
Vapour pressure:	Not applicable.
Density and/or relative density	
Density:	No information available.
Vapour density	Not applicable
Minimum ignition energy	No information available.
Fat solubility	No information available.

SECTION 10: Stability and Reactivity

10.1 Reactivity

No hazardous reactions known if stored and used as prescribed.

10.2 Chemical stability

No decomposition if used and stored according to specifications.

10.3 Possibility of hazardous reactions

No further relevant information is available.

10.4 Conditions to avoid

- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- Do not expose the rechargeable Li-ion battery to mechanical shock.
- Do not disassemble, crush, short-circuit, or connect with incorrect polarity. Avoid mechanical or electrical abuse.
- Do not allow contact with water or acidic substances.

10.5 Incompatible materials:

If the battery leaks or is damaged, avoid contact with strong oxidizing agents, mineral acids, strong alkalis and halogenated hydrocarbons.

10.6 Hazardous decomposition products:

No decomposition if used and stored according to specifications.

With open cells there is the possibility of the release of hydrofluoric acid and carbon monoxide. Irritating or toxic gases.

Peroxides

SECTION 11: Toxicological Information

11.1 Information on hazard classes as defined in Regulation WHS Regulations

Inhalation: No probable route of exposure of the product itself. Inhalation of substances leaked from damaged batteries may irritate the respiratory tract and damage organs during prolonged or repeated exposure.

- **Skin contact:** Contact with the undamaged battery does not present a hazard. Skin contact with damaged batteries may cause burns.
- **Eye contact:** Contact with the undamaged battery does not constitute a hazard. Eye contact with spills from the damaged battery may cause burns.
- **Ingestion:** No probable route of exposure of the product itself. Ingestion of spills may cause burns to the esophagus and stomach. Harmful if swallowed.

The product is declared as an article and is not subject to the GHS 7 classification and labelling requirements.

Acute toxicity Based on available data, the classification criteria are not met.

LD/LC50 values relevant for classification:			
ATE AU (Acute Toxicity Estimates)			
Oral	LD50	≥667 mg/kg	only in case of damaged or leaking battery
CAS: 105-37-3 ethyl propionate			
Oral	LD50	3,500 mg/kg (Rabbit)	only in case of damaged or leaking battery
CAS: 7429-90-5 aluminium			
Oral	LD50	15,900 mg/kg (rat)	only in case of damaged or leaking battery
Inhalative	LC50/4h	> 888 mg/m³ (rat)	only in case of damaged or leaking battery
CAS: 7440-50-8 copper foil			
Oral	LD50	> 2,000 mg/kg (rat)	only in case of damaged or leaking battery
CAS: 7782-42-5 Graphite			
Oral	LD50	> 2,000 mg/kg (rat)	only in case of damaged or leaking battery
CAS: 96-49-1 ethylene carbonate			
Oral	LD50	10,000 mg/kg (rat)	only in case of damaged or leaking battery
CAS: 108-32-7 propylene carbonate			
Oral	LD50	> 5,000 mg/kg (rat)	only in case of damaged or leaking battery
Dermal	LD50	> 2,000 mg/kg (Rabbit)	only in case of damaged or leaking battery

Primary irritant effect:

- **Skin corrosion/irritation** The electrolyte contained in the cell or battery causes skin burns.
- **Serious eye damage/irritation** The electrolyte contained in the cell or battery causes serious eye damage.
- **Respiratory or skin sensitization** Based on available data, the classification criteria are not met.
- **Germ cell mutagenicity** Based on available data, the classification criteria are not met.
- **Carcinogenicity** Based on available data, the classification criteria are not met.
- **Reproductive toxicity** Based on available data, the classification criteria are not met.
- **STOT-single exposure** Based on available data, the classification criteria are not met.
- **STOT-repeated exposure**

The electrolyte contains lithium hexafluorophosphate (1-).
The electrolyte contained in the cell or battery damages the organs during prolonged or repeated exposure.

- **Aspiration hazard** Based on available data, the classification criteria are not met.

All listed health effects apply only in case of damaged or leaking batteries.

Additional toxicological information:			
CAS: 108-32-7 propylene carbonate			
Oral	NOAEL	1,000 mg/kg bw/d (rat) OECD 414	only in case of damaged or leaking battery

Other information: There is no danger from the undamaged battery.

Repeated dose toxicity			
CAS: 108-32-7 propylene carbonate			
Oral	NOAEL	> 5,000 mg/kg bw/d (rat) OECD 408	only in case of damaged or leaking battery
Inhalative	NOAEL	100 ppm (rat) OECD 413	only in case of damaged or leaking battery

11.2 Information on other hazards

Endocrine disrupting properties:

None of the ingredients are listed.

SECTION 12: Ecological Information

12.1 Toxicity

Aquatic toxicity:	
CAS: 108-32-7 propylene carbonate	
EC50 (48 h)	1,000 mg/l (daphnia) (Daphnia magna)
LC50 (96 h)	1,000 mg/l (fish) (Cyprinus carpio)
NOEC (72 h)	900 mg/l (algae) (Desmodesmus subspicatus)
LC50 (72 h)	900 mg/l (algae) (Desmodesmus subspicatus)

12.2 Persistence and degradability

No further relevant information is available.

12.3 Bioaccumulative potential

No further relevant information is available.

12.4 Mobility in soil

No further relevant information is available.

12.5 Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

12.6 Endocrine disrupting properties

The product does not contain substances with endocrine disrupting properties.

12.7 Other adverse effects

Additional ecological information:

General notes:

- Avoid release to the environment.
- Water hazard class 2 (Self-assessment): hazardous for water:
  Do not allow product to reach ground water, water course or sewage system.

SECTION 13: Disposal Considerations

13.1 Waste treatment methods

Recommendation

Must not be disposed together with household garbage. Do not allow products to reach sewage system. Dispose only through authorized companies in accordance with local regulations.

Uncleaned packaging:

Recommendation: Dispose of packaging according to regulations on the disposal of packagings.

Additional information

Handle empty containers with care because residual vapours are flammable.

SECTION 14: Transport Information

14.1 UN number or ID number

ADG:	UN3480
IMDG:	UN3480
IATA:	UN3480

14.2 UN proper shipping name

ADG:	3480 LITHIUM ION BATTERIES
IMDG:	LITHIUM ION BATTERIES
IATA:	LITHIUM ION BATTERIES

14.3 Transport hazard class(es)

ADG, IMDG, IATA:	
Class	9 Miscellaneous dangerous substances and articles.
Label	9A

14.4 Packing group

ADG:	not regulated
IMDG:	not regulated
IATA:	not regulated

14.5 Environmental hazards:

Not applicable.

14.6 Special precautions for user

Warning: Miscellaneous dangerous substances and articles.

Hazard identification number (Kemler code):	--
EMS Number:	F-A,S-I
Stowage Category	A
Stowage Code	SW19 For batteries transported in accordance with SP 376 or SP 377 Category C, unless transported on a short international voyage.

14.7. Additional information

Other information: No supplementary information available.

Special transport precautions: Do not handle until all safety precautions have been read and understood.

Transport by road and rail

UN-No. (ADG)	3480
Special provision (ADG)	188, 230, 310, 348, 376, 377, 384, 387, 390
Limited quantities (ADG)	0
Excepted quantities (ADG)	E0
Packing instructions (ADG)	P903, P908, P909, P910, P911, LP903, LP904, LP905, LP906

Transport by sea:

UN-No. (IMDG)	3480

Air Transport

UN-No. (IATA)	3480

14.8. Hazchem or Emergency Action Code

Hazchem Code: 2Y

SECTION 15: Regulatory Information

15.1. Safety, health and environmental regulations specific for the product in question

- Work Health and Safety Act (WHS Act)
- Work Health and Safety Regulations
- ADG Code
- Safe Work Australia

15.2. International agreements

No additional information available

SECTION 16: Other Information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Relevant phrases

H225	Highly flammable liquid and vapour.
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H318	Causes serious eye damage
H319	Causes serious eye irritation.
H331	Toxic if inhaled
H372	Causes damage to organs through prolonged or repeated exposure.

Training hints

Regular training of staff involved in the transport of dangerous goods (in accordance with Chapter 1.3 ADG 7.8).

Abbreviations and acronyms:

AUH: AU Hazard Statements.
ADG: Accord relatif au transport international des marchandises dangereuses par route (Australian Code for the Transport of Dangerous Goods by Road & Rail)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonised System of Classification and Labelling of Chemicals
CAS: Chemical Abstracts Service (division of the American Chemical Society)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
ATE: Acute toxicity estimate values
Flam. Liq. 2: Flammable liquids – Category 2
Acute Tox. 3: Acute toxicity – Category 3
Acute Tox. 4: Acute toxicity – Category 4
Skin Corr. 1A: Skin corrosion/irritation – Category 1A
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Eye Irrit. 2: Serious eye damage/eye irritation – Category 2
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
STOT RE 1: Specific target organ toxicity (repeated exposure) – Category 1
STOT RE 2: Specific target organ toxicity (repeated exposure) – Category 2
AUH070: Toxic by eye contact.
AUH071: Corrosive to the respiratory tract.
Aquatic Chronic 2: Hazardous to the aquatic environment - long-term aquatic hazard – Category 2