



Howell Energy Co., Ltd

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MATERIAL SAFETY DATA SHEET (MSDS)

Production of SDS proving UN manual of Tests and Criteria, Part III, sub- section 38.3 is met
the International Air Transport Association (IATA) Dangerous Goods Regulations

Date of Preparation: Jan 3rd 2026

Section 1. Chemical Product and company Identification

Products Name: Li-ion battery

Model Number: AD2001

Rating: Nominal voltage: 14.4V

Capacity related: 3200mAh

Manufacturer Name: Howell Energy Co., Ltd

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Section 2. Composition/information on ingredients

Substance/preparation:				
Chemical name	Percent of the content	CAS.NO.	OSHA (PEL)	ACGIH
Lithium cobalt dioxide	25-35%	12190-79-3	N/A	0.02mg/m ³ as co
Graphite(C)	15-20%	7782-42-5	7.5mg/m ³ as dust	2mg/m ³
Polypropylene fluoride (PVDF)	1-5%	24937-79-9	N/A	N/A
Acetylene black	0.5-3%	1333-86-4	N/A	N/A
Aluminum (AL)	21-23%	7429-90-5	N/A	N/A
Copper (Cu)	10-11%	7440-50-8	N/A	N/A
Electrolyte	10-15%	623-53-0/21324-40-3	N/A	N/A
ACGIH: America council of Government industrial Hygienists				
TLV: Threshold Limited Value are personal exposure limits determined by the ACGIH				

Section 3. Hazards identification

Danger sort: N/A

Routes of Entry:

1. Eye and Skin- When leaking, the electrolyte solution contained in the battery irritates to ocular tissues and the skin.
2. Inhalation- Respiratory (and eye) irritation may occur if fumes are released due heat or an abundance of leaking batteries.
3. Ingestion- The ingestion of the battery can be harmful, content of open battery can cause Serious chemical burns of mouth, esophagus and gastrointestinal tract.
4. For urgent information, please contact with Howell Energy Co., Ltd for more information.

Health harm:

Exposure to leaking electrolyte from ruptured or leaking battery can cause:

1. Inhalation- Burns and irritation of the respiratory system, coughing, wheezing, and shortness of breath.
2. Eyes - Redness, tearing, burns. The electrolyte is corrosive to all ocular tissues.
3. Skin- The electrolyte is corrosive and causes skin irritation and burns.
4. Ingestion- The electrolyte solution causes tissues damage to throat and gastrointestinal track.
5. Environment harm: Not necessary under conditions of the normal use.

Explosion danger: The battery may be explosive at high temperature(above 150°C) or exposing

Section 4. First Aid measures

Eye Contact: Flush with plenty of water (eyelids held open) for at least 15minutes.

Skin Contact: Remove all contaminated clothing and flush affected areas with plenty of water and soap for at least 15 minutes.

Do not apply greases or ointments.

Ingestion: Dilute by giving plenty of water and get immediate medical attention at once.

Inhalation: Remove to fresh air and ventilate the contaminated area.

Give oxygen or artificial respiration if needed.

Section 5. Fire-fighting measures

Usual Fire and explosion hazard: The batteries can leak and/or spout vaporized or decomposed and combustible electrolyte fumes in case of exposure above 60°C resulting from inappropriate use or from the environment.

Possible formation of hydrogen fluoride (HF) and phosphorous oxides during fire. Phosphate (1-), hexafluoro, lithium salt contained in the electrolyte releases hydrogen fluoride (HF) in contact with water.

- Extinguishing media: Suitable: CO₂, Dry chemical or Foam extinguishers
- Not to be used: Type D extinguishers
- Special exposure hazards: Following cell overheating due to external source or due to improper use, electrolyte leakage or battery container rupture may occur and release inner component/material in the environment.

- Eye contact: The electrolyte solution contained in the battery is irritant to ocular tissues.
- Skin contact: The electrolyte solution contained in the battery causes skin irritation.
- Ingestion: The ingestion of electrolyte solution causes tissue damage to throat and gastro/respiratory tract.

Section 6. Accidental Release Measures

The material contained within the batteries would only be expelled under abusive conditions. Using shovel or broom, cover battery or spilled substances with dry sand or vermiculite, place in approved container (after cooling if necessary) and dispose in accordance with local regulations.

Section 7. Handling and Storage

The batteries should not be opened, destroyed nor incinerate since they may leak or rupture and release in the environment the ingredients they contain.

Handling:

- Do not crush, pierce, short (+) and (-) battery terminals with conductive (i.e. metal) objectives.
- Do not directly heat or solder.
- Do not dispose of fire.
- Do not mix batteries of different types and brands.
- Do not mix new and used batteries.
- Keep batteries in non-conductive (i.e. plastic) trays.
- Do not strike or throw the battery against hard surface.
- Do not directly solder the battery and pierce the battery with a nail or other sharp object.

Storage:

- Store in a cool (preferably below 30°C) and ventilated area away from moisture, sources of heat, open flames, food and drink.
- Keep adequate clearance between walls and batteries.
- Temperature above 70°C may result in battery leakage and rupture.
- Short circuit can cause burn, leakage and rupture hazard, keep batteries in original packaging until use and do not jumble them.
- Others: Follow HOWELL ENERGY's recommendations regarding maximum recommended currents and operating temperature range.
- Applying pressure or deforming the battery may lead to disassembly followed by eye, skin and throat irritation.

Section 8. Exposure Controls / Personal Protection

- Respiratory protection: Not necessary under normal use. In case of battery rupture, use self-contained full-face respiratory equipment.
- Hand protection: Not necessary under normal use. Use Viton rubber gloves if handling a leaking or ruptured battery.
- Eye protection: Not necessary under normal use. Wear safety goggles or glasses with side shields if handling a leaking or ruptured battery.

- Skin protection: Not necessary under normal use. Use rubber apron and protective working in case of handling of a ruptured battery.

Section 9. Physical and Chemical Properties

9.1 Appearance:

(Physical shape and color as supplied) Metal squares, hermetically sealed and fitted with an external plastic box.

9.2 Temperature range:

	Continuous	Occasional
In Storage	-20/+35°C	-20/+45°C
During Discharge	-20/+ 60°C	- 20/+ 60°C
During Charge	0/+ 45°C	0/+ 45°C

9.3 Mechanical resistance: As defined in relevant IEC standard

9.4 Others:

Section 10. Stability and Reactivity

Stability: Stable

Conditions to avoid: Do not heat, throw into fire, disassemble, short circuit, immerse in water over overcharge act.

Incompatibility: None during normal operation, Avoid exposure heat, open flame and corrosives.

Hazardous polymerization: Will not occur.

Hazardous Decomposition products: The battery may release irritative gas once the electrolyte leakage

Section 11. Toxic Information

The battery does not elicit toxicological properties during routine handling and use, if the battery is opened through misuse or damage, discard immediately. internal components of cell are irritant and sensitization.

Irritancy: The electrolyte contained in this battery can irritate eyes with any contact. Prolonged contact with the skin or mucous membranes may cause irritation.

Sensitization: No information is available.

Teratogenicity: No information is available.

Carcinogenicity: No information is available.

Mutagenicity: No information is available.

Reproductive: No information is available.

Section 12. Ecological Information

When properly used or disposed, HOWELL ENERGY Lithium-Ion polymer rechargeable batteries do not present environmental hazard.

Section 13. Disposal Considerations

1. Disposal of the battery should be performed by permitted, professional disposal firms knowledgeable in Federal, state or Local requirements of hazardous waste treatment and hazardous waste transportation.

2. The battery should be completely discharged prior to disposal and/or the terminals taped or capped to prevent short circuit. When completely discharged it is not considered hazards.
3. The battery contains recyclable materials recycling options available in your local area should be considered when disposing of this product. through licensed waste carrier.

Section 14. Transport Information

According to packing instruction 965-967 of IATA DGR 67th Edition for transportation. The special provision 188 of IMDG (ink Amit 42-24), the batteries should be securely packed and protected against short-circuits. Examine whether the package of the containers is integrating and tighten closed before transport. Take in a cargo of them without falling, dropping and breakage. Prevent collapse of cargo piles. Don't put the goods together with Oxidizer and chief food chemical. The Transport vehicle should prevent exposure, rain and High temperature. For stopovers, the vehicle should be awaiting from fire, and heat sources, when transported by sea, the assemble place should keep away from bedroom and kitchen, and isolated from the engine room, power and fire source, Under the condition of Road Transportation, the driver should drive in accordance with regulated route, don't stop over in the residential area and congested area.

A) UN number

3480&3481

B) UN proper shipping name

Lithium ion batteries (including li-ion polymer batteries) or: Lithium ion batteries contained in equipment or lithium ion batteries packed with equipment (include lithium ion polymer batteries)

C) Transport hazards class(es)

9

D) Packing instruction (if applicable)

PI965II/IB,966II,967II

E) Marine pollutant (YES/NO)

No

F) Transport In bulk (according to annex II of MARPAL 73/78 AND THE IBC code)

No information is available

F) Special precautions

No information is available

Section 15. Regulation Information

The transport of rechargeable lithiumion batteries regulated by the united nations asdetailed in the "model Regulations on the transport of dangerous Goods Ref.ST/SG/AC.10/1 Revision 21 2019".

Defined by UN in the "Recommendations on the transport of Dangerous GoodsChapter 38.3 Manual of Tests and Criteria Ref.ST/SG/AC.10/11 Rev.7 2019".The Lithium ion Cells and the battery Packs may or may not be assigned to the UN No.3480 Class-9 that is restricted for transport.

Section 16. Other Information

Prepared Department: Howell Energy Co., Ltd in Jan. 3rd 2026.

