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MATERIAL SAFETY DATA SHEET (MSDS)

Section 1. Chemical Product and Company Identification:

Product name: Li-Ion Polymer Battery,
Model No.: **IPAA-2600**,
Nominal Voltage: **3.7V** (inter-cell voltage), Battery Charging voltage: **4.2V**, Output: **1.5V**
Nominal Capacity: **710 mAh (0.71Ah)**
Equivalent Lithium content: **2.6 Wh**
Testing date: JAN., 02，2017

Section 2. Composition/Information on Ingredients:

INGREDIENT NAME	Quantity （%）	Density	CAS No.
Lithium Cobalt oxide ($LiCoO_2$)	< 20	2 mg/cm^3	12190-79-3
Graphite	15~20	2 mg/cm^3	7782-42-5
Copper	8~15	8.92 mg/m^3	7440-50-8
Aluminum	2~5	2 .70 mg/m^3	7429-90-5
EC, DMC, EMC and Lithium Hexa-fluorophosphate and so on	1-5	2.5 mg/m^3	21324-40-3
High polymers thing（SBR,CMC,PVDF)	< 20	--	--
Plastic, Silica gel	< 20	--	--

*Source：Technique engineer of Taidu Technology Co., Ltd. (Shenzhen, China) and material supply factory.

Section 3. Hazards Summarizing:

Danger sort	N/A
Routes of entry	1. Eyes 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.
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 tissue damage to throat and gastrointestinal track

Section 4. First Aid Measures:

Skin contact	Not anticipated. If the battery is leaking and the contained material contacts the skin, flush with copious amounts of clear water for at least 15 minutes.
Eye contact	Not anticipated. If the battery is leaking and the contained material contacts eyes, flush with copious amounts of clear water for at least 15 minutes. Get medical attention at once.
Inhalation	Not anticipated. If the battery is leaking, remove to fresh air. If irritation persists, consult a physician.
Ingestion	Not anticipated. If the battery is leaking and the contained material is ingested, rinse mouth and surrounding area with clear water at once. Consult a physician immediately for treatment.

Section 5. Fire Fighting Measures:

Unusual Fire and Explosion Hazards	Battery may explode or leak potentially hazardous vapors subject to: exposed to excessive heat (above the maximum rated temperature as specified by the manufacturer) or fire, over-charged, short circuit, punctured and crushed.
Hazardous Combustion Products	Fire, excessive heat, or over voltage conditions may produce hazardous decomposition products. Damaged batteries can result in rapid heating and the release of flammable vapors.
Extinguishing Media	Dry chemical type extinguishers are the most effective means to extinguish a battery fire. A CO2 extinguisher will also work effectively.
Fire Fighting Procedures	Use a positive pressure self-contained breathing apparatus if batteries are involved in a fire. Full protective clothing is necessary. During water application, caution is advised as burning pieces of flammable particles may be ejected from the fire.

Section 6. Accidental Release Measures:

The material contained within the battery would only be released under abusive conditions. In the event of battery rupture and leakage, collect all the released materials that are not hot or burning in an appropriate waste disposal container while wearing proper protective clothing and ventilate the area. Placed in approved container and disposed according to the local regulations.

Section 7. Handling and Storage:

Handling:

1. Batteries are designed to be recharged. However, improperly charging a battery may cause the battery to flame. When charging the battery, use dedicated chargers and follow the specified conditions.
2. Never disassemble or modify a battery.
3. Do not immerse, throw, and wet a battery in water.
4. Should a battery unintentionally be crushed, thus releasing its contents, rubber gloves must be used to handle all battery components. Avoid the inhalation of any vapors that may be emitted.
5. Short circuit causes heating. In addition, short circuit reduces the life of the battery and can lead to ignition of surrounding materials. Physical contact with to short-circuited battery can cause skin burn.
6. Avoid reversing the battery polarity, which can cause the battery to be damaged or flame.
7. In the event of skin or eye exposure to the electrolyte, refer to Section 4, First Aid Measures.

Storage

1. Batteries should be separated from other materials and stored in a noncombustible, well ventilated, sprinkler-protected structure with sufficient clearance between walls and battery stacks. Do not place batteries near heating equipment, nor expose to direct sunlight for long periods.
2. Do not store batteries above 35℃ or below －20℃. Store batteries in a cool (about 20±5℃) in a long time, dry and ventilated area that is subject to little temperature change. Elevated temperatures can result in reduced battery cycle life. Battery exposure to temperatures in excess of 60℃ will result in the battery venting flammable liquid and gases.
3. Keep batteries in original package until use and do not jumble them.

Section 8. Exposure Controls/Personal Protection

Engineering	Controls: Keep away from heat and open flame
Ventilation	Not necessary under conditions of normal use. In case of abuse, use adequate mechanical ventilation (local exhaust) for the battery that vent gas or fumes
Respiratory Protection	Not necessary under conditions of normal use. If battery is burning, leave the area immediately. During fire fighting fireman should use self-contained breathing, full-face respiratory equipment. Fires may be fought but only from safe fire fighting distance, evacuate all persons from the area of fire immediately.
Eye Protection	Not necessary under conditions of normal use. Use safety glasses with side shields if handling a leaking or ruptured battery.
Body Protection	Not necessary under conditions of normal use. Use rubber apron and protective working in case of handling a leaking of ruptured battery.
Protective Gloves	Not necessary under conditions of normal use. Use chemical resistant rubber gloves if handling a leaking or ruptured battery.
Others	Use good chemical hygiene practice. Wash hands thoroughly after cleaning-up a battery spill caused by leaking battery. No eating, drinking, or smoking in battery storage area.

Section 9. Physical and Chemical Properties

State	Solid
Odor	N/A
pH	N/A
Vapor pressure	N/A
Vapor density	N/A
Boiling point	N/A
Solubility in water	Insoluble
Specific gravity	N/A
Density	N/A

Section 10. Stability and Reactivity

Stability	Stable
Conditions to Avoid	Do not heat, throw into fire, disassemble, short circuit, immerse in water or overcharge, etc.
Incompatibility	None during normal operation. Avoid exposure heat, open flame and corrosives.
Hazardous Polymerization	Will not occur.
Decomposition Products	The battery may release irrigative gas once the electrolyte leakage.

Section 11. Toxicological 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 electrolytes 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 toxicity	No information is available.

Section 12. Ecological Information

1. When properly used and disposed, the battery does not present environmental hazard.
2. The battery does not contain mercury, cadmium, or lead.
3. Do not let internal components enter marine environment. Avoid releasing to water ways, wastewater or ground water.

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 hazardous.
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

The Li-ion Battery have pass the test UN manual of Tests and Criteria, part III, sub-section 38.3 According to packing instruction PI965-PI967 section Ⅱ of IATA DGR 58th Edition for transportation, or the special provision 188 of IMDG. The products are not subject to dangerous goods.

UN Number: UN3840

Shipping Name: Lithium Batteries.

Hazard classification: Class 9

Packing Group: II

IMDG Code: 3840 (shipment of cells and batteries in bilk)

Marine pollutant: No

ADR Class: Class 9

Packing Group: More information concerning shipping testing, marking and packaging can be obtained from Label master at Separate Lithium-ion batteries when shipping to prevent short-circuiting.

They should be packed in strong packaging for support during transport with content of Lithium less than 20Wh per cell or 100Wh per battery.

Take in a cargo of them without falling, dropping, and breakage. Prevent collapse of cargo piles and wet by rain.

Transport Fashion: By air, by sea.

Section 15. Regulatory Information

1. The transport of rechargeable lithium-ion batteries is regulated by various bodies (IATA, IMO, ADR, US-DOT) that follow the United Nations "Recommendations on the Transport of Dangerous Goods, Model Regulations, 2017 IATA 58th edition".
2. Lithium batteries and cells in aircrafts are subjected to shipping requirements exceptions under 49 CFR 173.185
3. Shipping of lithium batteries in aircrafts are regulated by international civil aviation organization (ICAO) and the international air transportation (IATA) requirements in special provision “PI965”. The shipment contains of PI965 including the passing of the UN38.3 test and the reference number. The lithium battery is complied with IATA-DGR, special provision A123.
4. Shipping of lithium batteries on sea are regulated the international maritime dangerous goods (IMDG) requirements of UN3840 (Lithium ion batteries)
5. Cobalt compounds supposed hazardous and subjected to reporting requirements of section 313 of title 1.1 of the suspend are amendments and reauthorization act of 1986 (SARA) and 40 CFR part 372.
6. Packing instruction has the shipment comply with section II of PI965. The consignment does not contain any recalled and/or defective batteries.

Section 16. Other Information

The above information is based on the data of which we are aware and is believed to be correct as of the data hereof. Since this information may be applied under conditions beyond our control and with which may be unfamiliar and since data made available subsequent to the data hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is fumes upon condition that the person receiving it shall make his own determination of the material for his particular purpose.

The information and recommendations set forth are made in good faith and are believed to be accurate at the date of preparation. Taidu Technology Co., Ltd. (Shenzhen China) makes no warranty expressed or implied.

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