旭星電子股份有限公司
Top Best Energy Storage Corp.

MATERIAL SAFETY DATA SHEET

IDENTITY	Product Category	:	Rechargeable Li-ion Battery Pack
	Model Name	:	ME0704B
	Brand	:	國睦
	Nominal Capacity	:	11.5Ah
	Nominal Voltage	:	24V
	Watt-hour	:	276W/hr
	Chemical System	:	Lithium Cobalt Dioxide / Carbon
	Desigened for Recharge	:	☒ Yes ☐ No

SECTION 1 MANUFACTURER'S INFORMATION

Manufacturer's Name	:	Top Best Energy Storage Corp.
Supplier's Name	:	Top Best Energy Storage Corp.
Supplier's Address	:	8F, No.237,Sec. 1,Datong Rd.,Xizhi Dist.,New Taipei City 221, Taiwan
Information Telephone	:	886-2-2691-9688
Emergency Telephone	:	886-2-2691-9819
Date Prepared	:	2022/08/01

SECTION 2 HAZARDS IDENTIFICATION

PRIMARY ROUTES OF ENTRY

Skin contact, Skin absorption, Eye contact, Inhalation, and Ingestion : NO

SYMPTOMS OF EXPOSURE

Skin contact: No effect under routine handling and use.

Skin absorption: No effect under routine handling and use.

Eye contact: No effect under routine handling and use.

Inhalation: No effect under routine handling and use.

REPORTED AS CARCINOGEN : Not applicable

SECTION 3 MATERIAL AND INGREDIENTS INFORMATION

Battery Cell：

Components	CAS#	Content (wt%)
Lithium Cobalt Dioxide (LiCoO2)	12190-79-3	less than 41wt%
Electrolyte (-)	21324-40-38,96-49-1 and others	Less than 16wt%
Graphite (C)	7782-42-5	less than 20wt%
Aluminum (Al)	7429-90-5	less than 22wt%
Copper, Nickel metal and inert materials	7440-50-8 and others	Remainder
Lead (Pb)*	7439-92-1	less than 0.004wt%(40ppm)
Mercury (Hg)*	7439-97-6	less than 0.0005wt%(5ppm)

Circuit Module：

HAZARDOUS INGREDIENTS	%	CAS number
Lead	<0.1	7439-92-1
Mercury	0	7439-97-6
Chromium	0	7440-47-3
Cadmium	0	7440-43-9

Plastic Parts：

HAZARDOUS INGREDIENTS	%	CAS number
Bisphenol A - Polycarbonate	74 ~ 83	25971-63-5
Flame retardant	10 ~ 17	181028-79-5
Further additives	0.5 ~ 5	

SECTION 4 FIRST-AID MEASURES

Internal cell materials of an opened battery cell

・ Inhalation：

Make the victim blow his/her nose, gargle. Seek medical attention if necessary.

・ Skin contact：

Remove contaminated clothes and shoes immediately. Wash the adhere or contact region with soap and plenty of water immediately.

・ Eye contact：

Immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention immediately.

A battery cell and internal cell materials of an opened battery cell

・ Ingestion：

Induce vomiting. When it is impossible or the feeling is not well after vomiting, seek medical attention.

SECTION 5 FIRE-FIGHTING MEASURE

GENERAL HAZARD

Cell is not flammable but internal organic material will burn if the cell is incinerated. Combustion products include, but are not limited to hydrogen fluoride, carbon monoxide and carbon dioxide.

EXTINGUSHING MEDIA

Use extinguishing media suitable for the materials that are burning.

SPECIAL FIREFIGHTING INSTRUCTIONS

If possible, remove cell(s) from fire fighting area. If heated above 125°C, cell(s) can explode/vent.

FIREFIGHTING EQUIPMENT

Use NIOSH/MSHA approved full-face self-contained breathing apparatus (SCBA) with full protective gear.

SECTION 6 ACCIDENTAL RELEASE MEASURES

ON LAND

Place material into suitable containers and call local fire/police department.

IN WATER

If possible, remove from water and call local fire/police department.

SECTION 7 HANDLING AND STORAGE

Storage	:	Store in a cool, well-ventilated area. Do not expose to high temperature（45℃）. Since short circuit can cause burn hazard or safety vent to open, do not store with metal jewelry, metal covered tables, or metal belt.
Handling	:	Do not disassemble, crush or solder. Do not short + and – terminals with a metal. Do not open the battery.
Charging	:	Charge within the limits of 0℃ to 45℃ temperature. Charge with specified charger designed for this battery.
Discharging	:	Discharge within the limits of -20℃ to 60℃ temperature.
Battery Energy Rate	:	The cell capacity at shipment is 30% of the full capacity.
Disposal	:	Dispose in accordance with applicable federal, state and local regulations.
Warning	:	Fire or explosion if incorrectly installed, shorted, disassembled, hated or

disposed of in fire.

SECTION 8 Exposure controls/personal protection

Engineering controls

Keep away from heat and open flame. Store in a cool, dry place.

Personal Protection

Respirator

Not required during normal operations. SCBA required in the event of a fire.

Eye/face protection

Not required beyond safety practices of employer.

Gloves

Not required for handling of cells.

Foot protection

Steel toed shoes recommended for large container handling.

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

REACTIVITY

None

INCOMPATIBILITIES

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

HAZARDOUS DECOMPOSITION PRODUCTS

None during normal operating conditions. If cells are opened, hydrogen fluoride and carbon monoxide may be released.

CONDITIONS TO AVOID

Avoid exposure to heat and open flame. Do not puncture, crush or incinerate

SECTION 11 TOXICOLOGICAL INFORMATION

None unless internal materials are exposed.

In case of exposure, these cells contain the chemicals listed below.

Components	Acute toxicity (ACGIH)
Lithium cobalt dioxide ($LiCoO_2$)	0.02mg/m^3 as Co
Lithium hexafluorophosphate ($LiPF_6$)	2.5 mg/m^3 as F
Ethylene carbonate ($C_3H_4O_3$)	Not Established
Chain carbonate (-)	Not Established
Graphite (C)	2 mg/m^3 as dust

In case of internal has released or electrolyte spilled: Electrolyte containing $LiPF_6$ and organic Solvents has a small amcunt of toxicity and may cause irritation of the skin or eyes. Released may also cause irritation of skin or eyes.

None of the following substances will be exposed, leaked, or emitted during transportation, storage or any operation and any temperature condition:

Chlorinated Fluorohydrocarbon (FCKW)

Acrylonitride

Styrol

Phenol

Benzol

Mercury of greater than 0.0001 wt% for alkaline battery

Mercury of greater than 0.0005 wt% for other battery

Cadmium, lead, and other harmful heavy metal

Lithium ion batteries containing no more than 1.5g/cell and 8g/battery pack

Lithium ion cell, a watt-hour rating is not more than 20Wh and for lithium ion battery is not more than 100Wh

And will comply with the regulation of 49 CFR (DOT regulation), International Air Transport Association (IATA), and Deuche Forschungsgemeinschaft (DFG) regarding concentrations of emitted substances.

If the cells are opened through misuse or damage, discard immediately. Internal components of cell are irritants and sensitizers.

SECTION 12 ECOLOGICAL INFORMATION

Some materials within the cell are bioaccumulative. Under normal conditions, these materials are contained and pose no risk to persons or the surrounding environment.

SECTION 13 DISPOSAL CONSIDERATIONS

- Recommended methods for safe and environmentally preferred disposal：

Product(waste from residues)

Do not throw out a used battery cell. Recycle it through the recycling company.

Contaminated packaging

Neither a container nor packing is contaminated during normal use. When internal materials leaked from a battery cell contaminates, dispose as industrial wastes subject to special control.

SECTION 14 Transport information

The Lithium Ion batteries are considered to be "Rechargeable batteries" and meet the requirements of transportation by the U.S. Department of Transportation(DOT), International Civil Aviation Administration(ICAO), International Air Transport Association(IATA) Dangerous Goods Regulations (61th Edition,2020. Hazard class is class 9,Special Provision A88, A99, A154 , A164, A181, A182 and Section II or IB of package instruction 965,966 or 967 for lithium ion batteries for UN 3481) and belong to non-dangerous goods and meets all requirements under UN Manual of Tests and Criteria Part III, subsection 38.3.

The International Maritime Dangerous Goods (IMDG) Code ，2020 Edition（Incorporating Amendment 40-20）with special provision 188 & 230.

SECTION 15 REGULATORY INFORMATION

Regulations specifically applicable to the product：

- The transport of the lithium batteries is regulated by the United Nations, "Model Regulations on Transport of Dangerous Goods Special Provisions A188".
- Lithium batteries are subject to shipping requirements exceptions under 49 CFR 173.185(paragraph c).
- Shipping of Lithium batteries in aircrafts are regulated by the International Civil Aviation Organization

(ICAO) and the International Air Transport Association (IATA) requirements in Special Provision "A48".

- Shipping of lithium batteries on sea are regulated the International Maritime Dangerous Goods (IMDG) requirements.
- The internal component (thionyl chloride) is non-hazardous and under the criteria of the Federal OHSA Hazard Communication Standard 29 CFR 190.1200.

SECTION 16 SPECIAL PROTECTION INFORMATION

Respiratory Protection	:	Not necessary under normal use.
Ventilation	:	Not necessary under normal use.
Eye Protection	:	Not necessary under normal use.
Protective Gloves	:	Not necessary under normal use.