

Material Safety Data Sheet



Report No.: A2302066-C01-R11

Date: February 15, 2023

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1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

Product Name: PixelBrick containing Li-ion battery

Model No.: PB15

Applicant: Astera LED Technology GmbH

Applicant Address: Stahlgruberring 36, 81829 Munich, Germany

Emergency Telephone: +49(0)89 215522530

2. HAZARDS IDENTIFICATION

- Most important hazards:**
1. Environmental influence: Air pollution, if spill into water source, will pollute water quality.
 2. Physical and chemical hazards: Inflammable and explosive.
 3. If the electrolyte contacts with water, it will generate detrimental gases. Since the leaked electrolyte is inflammable liquid, do not bring close to fire.

Inhalation: The steam of the electrolyte will stimulate a respiratory tract.

Eye Contact: The steam of the electrolyte stimulates eyes.

Skin Contact: The steam of the electrolyte stimulates skin.

Environmental properties: They pollute the environment, do not throw out it into the environment.

3. COMPOSITION/INFORMATION ON INGREDIENTS

| Chemical composition | Molecular formula | Cas No. | Weight (%) |
|---|----------------------------------|-------------|------------|
| Lithium transition metal oxide ⁽²⁾ | Li_xMO_2 | 182442-95-1 | 37.3 |
| Carbon (graphite) | C | 7782-42-5 | 21.0 |
| Aluminum | Al | 7429-90-5 | 3.27 |
| Copper | Cu | 7440-50-8 | 7.69 |
| Steel can | Fe | 7439-89-6 | 13.53 |
| Electrolyte | $\text{C}_3\text{H}_4\text{O}_3$ | 96-49-1 | 10.67 |
| | $\text{C}_4\text{H}_8\text{O}_3$ | 623-53-0 | |
| | $\text{C}_3\text{H}_6\text{O}_3$ | 616-38-6 | |
| | F_6LiP | 21324-40-3 | |
| Others | -- | proprietary | 6.54 |

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4. FIRST AID MEASURES

Emergency treatment for different exposure routes

Inhalation: Transfer to fresh air, if breathing is stopped, give artificial respiration, if needed, give oxygen and breathing aid. Consult a doctor immediately.

Skin contact: Not applicable for finished product.

Eye contact: No special measures as there is no hazard for normal contact.

Ingestion: Do not induce vomiting without professional instruction. Get medical attention immediately.

Additional advice: Never give anything by mouth to an unconscious person. Show this safety data sheet to the doctor in attendance. Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media: Dry chemical powder, sandy soil. Avoid using water and carbon dioxide.

Specific hazards: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Special protective equipment for firefighters:

1. The hazardous substance may be exposure when being heated over 100°C(+212°F) or disposed in fire.
2. The electrolyte is flammable liquid and must be kept away from any kind of ignition source.
3. If cell / battery exposed to fire, cool the accumulator outside to avoid its breaking.
4. Evacuate all persons from immediate area of fire.
5. Do not re-enter the area until the fire was extinguished.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Wear personal protective equipment. Ensure adequate ventilation.

Environmental precautions: Avoid water (including surface water and groundwater) contamination. Avoid ground and atmosphere contamination. Keep internal materials of cell away from heat and open flame.

Methods for cleaning up: Cut off the fire. Quickly evacuate the personnel from the contaminated area to a safe area. And isolate strictly and restrict their access. Self-contained positive pressure: breathing apparatus and protective clothing are recommended; Cut off the leakage source as much as possible. Prevent access to sewer, drainage ditch and other restrictive space; small amount of leakage: as far as possible will overflow leakage liquid collection in the closed container with sand, activated carbon or other inert materials to absorb residual liquid, can also be made of non-combustible dispersant emulsion scrub, lotion diluted into the wastewater system; Excretion: to build a dike or dig a pit for shelter. Cover with foam to reduce vapor hazards. Spray water to cool and dilute steam to protect field personnel. Into suitable containers for disposal.

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7. HANDLING AND STORAGE

Storage:

1. Keep away from heat sources, ignition sources and incompatible materials.
2. Store and handle flammable materials must be in accordance with all appropriate regulations;
3. Do not use with incompatible materials (such as strong oxidizing agents) to avoid the risk of fire danger and explosion.

Handling:

Do not breathe vapors or fumes that may be evolved during processing.

Do not disassemble or burn batteries.

Do not squeeze or pierce batteries.

Do not put batteries into water.

Workers must wear proper protective equipment and must operate strictly according to relative rules.

Packaging material: Store in a cool (below 30°C), dry and ventilated area. Keep away moisture, sources of heat, open flame. High temperature may result in battery pack leakage and rupture. Keep battery pack in original packaging until use and do not jumble them. The battery pack should be between 25% and 75% of full charge when stored for along period of time (The longest time is not over six months).

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Personal protective equipment:

Respiratory protection: Use an approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hand protection: Wear appropriate gloves to prevent skin exposure.

Eye protection: Wear appropriate protective eyeglasses or chemical safety goggles.

Hygiene measures: Use only in area provided with appropriate exhaust ventilation. Handle in accordance with good industrial hygiene and safety practice.

Environmental exposure controls: No information available.

9. PHYSICAL AND CHEMICAL PROPERTIES

Voltage: 18V

Capacity: 3350mAh/60.3Wh

Appearance: Blue, cuboid, odorless, solid Rechargeable Li-ion Battery Pack.

Shenzhen Alpha Product Testing Co., Ltd.

Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China

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10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions

Hazardous decomposition products: Electrolyte may react with water in the atmosphere and produce toxic materials including hydrofluoric acid. Thermal decomposition of the cells may produce of noxious or toxic fumes containing CO₂, CO, H₂, CH₄, C₂H₄ and C₂H₆. Thermal decomposition of the cell may produce releasing of electrolyte liquid/vapor, noxious materials dust and methane.

Materials to avoid: Strong mineral acids, alkali solutions, strong oxidizing materials and conductive materials.

Conditions to avoid: Heat, incinerate, shock, impact, crush, vibrate, puncture, short-circuit, disassemble and store in humid environment.

11. TOXICOLOGICAL INFORMATION

Signs & Symptoms: The corrosive fumes will be very irritating to skin, eyes and mucous membranes. Over exposure can cause symptoms of non-fibrotic lung injury and membrane irritation.

Inhalation: The leaked or ruptured battery pack can cause respiratory system and mucosa irritation. If gas is generated, throat irritation and nausea may occur. The inside materials of battery pack may cause an allergic reaction.

Skin Contact: Electrolyte can cause a skin irritation. Contact with Nickel and its compounds may cause allergic dermatitis.

Eye Contact: Electrolyte can cause a skin irritation.

Ingestion: Electrolyte ingestion may cause damages to body tissues and to respiratory and digestive systems.

Carcinogenetic: Nickel derivatives are classified in suspected carcinogenetic list by the National Toxicology Program of the US. Public Health Service.

Special effects: It may occur eczema, skin allergies, lung injuries, asthma and other respiratory disorders

12. ECOLOGICAL INFORMATION

Ecotoxicity effects:

1. Some materials within the cell are bioaccumulation.
2. Cause pollution to water sources, do not dispose into rivers, ditches or ground surface.

13. DISPOSAL CONSIDERATIONS

Waste from residues:

- Do not allow product to reach sewage system.
- Do not throw it into any open bodies of water.
- Dispose of in accordance with local regulations.

Contaminated packaging:

1. Neither a container nor packing is contaminated during normal use. When internal 2. materials leaked from a battery pack contaminates, dispose as industrial wastes subject to special control.

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14. TRANSPORT INFORMATION

Transport information:

Product name: PixelBrick containing Li-ion battery

UN Number: UN3481

According to PACKING INSTRUCTION 967 IBof IATA DGR 64th 2023 Edition for transportation, the special provision 188 of IMDG (Amdt 40-20), or the Technical Instructions for the Safe Transport of Dangerous Goods (TI).

Special transportation method and precautions:

In the case of transportation, avoid exposure to high temperature and prevent the formation of any condensation. During the transportation, avoid falling, dropping, wet and damage.

More information concerning shipping, testing, marking and packaging can be obtained from Label master at <http://www.labelmaster.com>.

Transport Fashion: By air, by sea, by railway, by road.

15. REGULATORY INFORMATION

1. UN Recommendations on the Transport of Dangerous Goods.
2. Code of Federal Regulations (CFR): 29 CFR 1910.1200(g) Toxic and Hazardous Substances.
3. Code of Federal Regulations (CFR): Title 49 Transportation 173.185 Lithium cells and batteries.
4. International Air Transport Association (IATA): Dangerous Goods Regulations (64th edition, 2023).
5. International Maritime Organization (IMO): International Maritime Dangerous Goods (IMDG) Code.

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 furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

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