# Anhui Leoch Renewable Energy Development Co., Ltd

## Material Safety Data Sheet

## SECTION 1: PRODUCT IDENTIFICATION

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| **Product Name:** | Lithium Iron Battery |
| **Model:** | LFELI-48100 |
| **Proper Shipping Name:** | Lithium ion batteries (including lithium ion polymer batteries) |
| **Manufacturer's Name:** | Anhui Leoch Renewable Energy Development Co., Ltd |
| **Address:** | 32#, Wutong Avenue, Economic Development Zone, Huaibei Anhui, Province, China |
| **Contact:** | 0561-6061333 |
| **Date Issued:** | Jan 01,2024 |

## SECTION 2: HAZARDS IDENTIFICATION

Not classified as dangerous or hazardous with normal use. The cell should not be opened or burned. Exposure to the ingredients contained within or their combustion products could be harmful.

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|  | Causes severe skin burns and serious eye damage.<br>May damage fertility or the unborn child if ingested or inhaled.<br>May cause cancer if ingested or inhaled.<br>Causes damage to central nervous system, blood and kidneys through prolonged or repeated exposure.<br>May form explosive air/gas mixture during charging.<br>Extremely flammable gas.<br>Explosive, fire, blast, or projection hazard. May cause harm to breast-fed children<br>Harmful if swallowed, inhaled, or contact with skin<br>Causes skin irritation, serious eye damage. |
|  | Wash thoroughly after handling.<br>Do not eat, drink or smoke when using this product.<br>Wear protective gloves/protective clothing, eye protection/face protection.<br>Avoid breathing dust/fume/gas/mist/vapors/spray.<br>Contact with internal components may cause irritation or severe burns. Avoid contact with internal acid. Irritating to eyes, respiratory system, and skin.<br>Keep away from heat/sparks/open flames/hot surfaces. No smoking.<br>Do not handle until all safety precautions have been read and understood.<br>Use personal protective equipment as required. |

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

| COMPONENTS | CAS Number | Approx % by Wt. |
|---|---|---|
| Lithium Iron Phosphate | 15365-14-7 | ~35% |
| Electrolyte (Proprietary) | -- | ~25% |
| Nickel | 7440-02-0 | ~0.1% |
| PVDF | 24937-79-9 | ~1% |

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|---|---|---|
| Copper | 7440-50-8 | ~8% |
| Aluminum | 7429-90-5 | ~5% |

## SECTION 4: FIRST-AID MEASURES

Battery is considered as sealed non-spillable one. Under normal operating conditions, the materials sealed inside should not be hazardous to people's health. Only when these materials exposed during production or under case broken condition or being extremely heated (fired), they may be hazardous to people's health.

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| **General Advice** | Provide this SDS to medical personnel for treatment. |
| **Eye Contact** | Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. lf irritation occurs and persists, contact a medical doctor. |
| **Skin Contact** | Remove contaminated clothing and thoroughly wash with soap and plenty of water. lf irritation persists. contact a medical doctor. |
| **Inhalation** | Remove to fresh air. lf breathing difficulty or discomfort occurs and persists. see a medical doctor. lf breathing has stopped, give artificial respiration and see a medical doctor IMMEDIATELY. |

**Most Important Syptoms and Effects**

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| **Symptoms** | Based on physical state of the product, accidental exposure is unlikely. |

**Indication of Any lmmediate Medical Attention and Special Treatment Needed**

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| **Notes to Physician** | Treat symptomatically. |

## SECTION 5: FIRE-FIGHTING MEASURES

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| **Flammable Properties:** | Lithium ion batteries contain flammable liquid electrolyte that may vent, ignite and produce sparks when subjected to high temperatures (> 150 C (302 °F)), when damaged or abused (e.g, mechanical damage or electrical overcharge). Burning cells can ignite other batteries in close proximity. |
| **Suitable extinguishing Media:** | Use extinguishing measures that are appropriate to local circumstances and the surrounding environment |
| **Small Fire** | Carbon Dioxide, Dry Chemical, Foam, Water Fog |
| **Large Fire** | Move containers from fire area if you can do it without risk. Carbon Dioxide, Dry Chemical Foam,Water Fog. |
| **Unsuitable extinguishing** | Not Determined |
| **Specific Hazards arising from the Chemical:** | Exposing battery or cell to excessive heat, fire, or over voltage condition may cause flame or leak potentially hazardous organic vapors and produce hazardous decomposition producls. Damaged or opened cells and batteries can result in rapid heating and the release of flammable vapors. |
| **Hazardous Combustion Products:** | Fire will produce irritating, corrosive and/or toxic gases |
| **Protective Equipment and Precautions for Firefighters** | As in any fire, wear self-contained breathing apparatus pressure-demand. MSHA/NIOSH (approved or equivalent) and full protective gear. |

## SECTION 6: ACCIDENTAL RELEASE MEASURES

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| **Personal Precautions, Protective Equipment and Emergency Procedures** | **Personal Precautions** | As an immediate precautionary measure, isolate spill or leak area for at least 25 meters(75feet) in all directions. Keep unauthorized personnel away. Stay upwind. Keep out of low areas.<br>Ventilate closed areas before entering<br>Use personal protective equipment as required. |
| | **Environmental Precautions:** | Prevent material from contaminating soil and from entering sewers or waterways. |
| | **Other Information** | ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area) |
| **Methods and Material for Containment and Cleaning Up** | **Methods for Containment** | Prevent further leakage or spillage if safe to do so. Do not release runoff from fire control methods to sewers or waterways. |
| | **Methods for Clean Up** | Ground and bond containers when transferring material. Sweep up and shovel into suitable containers for disposal. For waste disposal, see section 13 of the SDS. |

## SECTION 7: HANDLING AND STORAGE

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| **Advice on Safe Handling** | **CHARGING/ DISCHARGING:** | Cells and batteries are designed to be rechargeable.<br>However, abnormal charging may cause batteries to flame, and abnormal discharging may result in damaging batteries.<br>Use approved chargers and procedure only. |
| | **BATTERY DISASSEMBLE:** | Do not disassemble a battery in any case. If a battery was unintentionally crushed or damaged, thus releasing its contents, rubber gloves must be used to handle all battery components. Avoid inhalation of vapors that may be omitted. |
| | **BATTERY SHORT CIRCUIT:** | The battery is an energy source that converts electric power into the chemical form of energy. Therefore, short circuiting the battery may cause the chemical reaction to occur too intensively and provide an ignition source. |
| | **MIXED BATTERIES AND TYPES:** | Do not assemble batteries with series or parallel connection. The use of old and new cells of varying capacity or different electrochemical battery systems should be avoided. |
| **Conditions for Safe Storage,** | **STORAGE CONDITIONS** | Fix positive and negative terminals properly to avoid short circuit.<br>Store in cold and well-ventilated area preventing exposure from direct sunlight and other sources of heat.<br>Elevated temperatures can result in reduced battery service life. |

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

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| **Exposure Limit Values:** | Airborne exposures to hazardous substances are not expected when product is used for its intended purpose. |
| **Engineering Controls:** | Use local exhaust ventilation or other engineering controls to control sources of dust, mist, fume and vapor. |
| **Personal Protection:** | Not necessary under normal conditions |
| **Respiratory Protection:** | Not necessary under normal conditions. |
| **Skin Protection:** | Not necessary under normal conditions. Wear neoprene or natural rubber gloves if handling an open or leaking cell. |
| **Eye Protection:** | Not necessary under normal conditions. Wear safety glasses if handling an open or leaking cell. |
| **Other Protective Equipment:** | Not necessary under normal conditions. lf exposure to the electrolyte solution is expected due to non-routine tasks, a safety shower and eye-wash fountain readily available in the immediate work area. |
| **Other Protective Equipment:** | Do not eat, drink or smoke in work areas. Maintain good housekeeping. |

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

| **Material** | **Appearance** | **Odor** | **Sublimating Point** | **Freezing Point/Melting Point** | **Solubility in water** | **Density** |
|---|---|---|---|---|---|---|
| PVDF | Powder | Odorless | -- | 165-172℃ | Negligible | 1.76-1.80g/ml |
| Copper | Metal | Odorless | -- | 1088℃ | Insoluble | 8.96g/ml |
| Nickel | Metal | Odorless | -- | 1555℃ | Insoluble | 8.91g/ml |
| Aluminum | Metal | Odorless | -- | 660℃ | Insoluble | 2.7g/ml |
| Electrolyte | Colorless Liquid | organic odor | 126℃ | -- | Partial | -- |

## SECTION10: PHYSICAL AND CHEMICAL PROPERTIES

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| **Stability:** | Stable under recommended storage conditions. |
| **Conditions to Avoid:** | Avoid exposing the cell to fire or temperatures above 80°C. Do not disassemble, crush, short or install with incorrect polarity. Avoid mechanical or electrical abuse. |
| **Incompatible Materials:** | Do not immerse in water or other high conductivity liquids. |
| **Possibility of Hazardous Reactions:** | If battery assembly is damaged, contents may release flammable vapors. |

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| **Hazardous Decomposition Products:** | This material may release toxic fumes if burned or exposed to fire. Breaching of the cell enclosure may lead to generation of hazardous fumes which may include extremely hazardous hydrofluoric acid. |

## SECTION11: TOXICOLOGICAL INFORMATION

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| **Acute Toxicity Data:** | Acute oral, dermal and inhalation toxicity data are not available for this article. |
| **Other Toxicity Data:** | Not applicable. |
| **Irritation:** | Risk of irritation occurs only if the cell is mechanically, thermally or electrically abused to the point of compromising the enclosure. If this occurs, irritation to the skin, eyes and respiratory tract may occur. |
| **Corrosivity:** | Not applicable. |
| **Sensitization:** | Not applicable. |
| **Neurological Effects:** | Not applicable. |
| **Genetic Effects:** | Not applicable. |
| **Reproductive Effects:** | Not applicable. |
| **Developmental Effects:** | Not applicable. |
| **Target Organ Effects:** | Not applicable. |
| **Carcinogenicity:** | Normal safe handling of this product will not result in exposure to substances that are considered human carcinogens by IARC (International Agency for Research on Cancer), ACGIH (American Conference of Governmental Industrial Hygienists), OSHA (Occupational Safety and Health Administration) or NTP (National Toxicology Program). |

## SECTION12: ECOLOGICAL INFORMATION

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| **Ecotoxicity:** | Not applicable |
| **Mobility:** | Not applicable |
| **Persistence and degradability:** | Not readily biodegradable |
| **Bioaccumulative potential:** | Not applicable |
| **Other adverse effects:** | Solid cells released into the natural environment will slowly degrade and may release harmful or toxic substances. Cells are not intended to be released into water or on land but should be disposed or recycled according to local regulations. |

## SECTION13: DISPOSAL CONSIDERATIONS

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| **Waste Disposal Method:** | Cell recycling is encouraged. Do NOT dump into any sewers, on the ground or into any body of water. Store material for disposal as indicated in Section 7 Handling and Storage. |

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| **USA:** | In the United States, dispose of in accordance with local, state and federal laws and regulations. Consult universal/hazardous waste regulations for further information regarding disposal of spent batteries. If a battery is leaking/broken open, consult hazardous waste regulations under US Environmental Protection Agency's Resource Conservation and Recovery Act (RCRA). Also, consult state and local regulations for further disposal requirements. |
| **Canada:** | Dispose of in accordance with local, provincial and federal laws and regulations. |
| **EU:** | Waste must be disposed of in accordance with relevant EC Directives and national, regional and local environmental control regulations. For disposal within the EC, the appropriate code according to the European Waste Catalogue (EWC) should be used. |

## SECTION14: TRANSPORT INFORMATION

Leoch batteries are designed to comply with all applicable shipping regulations as prescribed by industry and legal standards which includes compliance with the UN Recommendations on the Transport of Dangerous Goods; IATA Dangerous Goods Regulations and applicable U.S. DOT regulations or the safe transport of lithium-ion batteries and the International Maritime Dangerous Goods Code. This battery has passed the UN Manual of Tests and Criteria Part III Subsection 38.3, which is required by all of the directives listed above.

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| **UN Number:** | UN3480/UN3481 |
| **Proper Shipping Name:** | Lithium ion batteries (including lithium ion polymer batteries) |
| **Hazard Class/Division:** | 9 |
| **Packing Group** | Group II (Not apply to PI952 and PI967 Section I) |
| **Label Required:** | The Class 9—Lithium Battery hazard label, the Cargo aircraft Only Label,<br>The Class9—Miscellaneous Dangerous Goods |
| **ICAO / IATA:** | Can be shipped by air in accordance with International Civil Aviation Organization (ICAO), Tl or International Air Transport Association(IATA), DGR Packing Instructions (PI) 965 Section IA appropriate of IATA DGR 65$^{th}$ (2023 Edition) for transportation. |
| **IMDG CODE:** | Intemational Maritime Dangerous Goods Code IMDG CODE(Amdt 41-22) |
| **DOT:** | Other requirements for the US Department of Transportation (DOT)Subchapter C, Hazardous Materials Regulations if shipped incompliance with 49 CFR 173.185. |
| **ADR/ADN** | Transport Requirements for United Nations Economic Commission for Europe (UNECE)ADR/ADN, Applicable as from 1 January 2023. |

## SECTION15: REGULATORY INFORMATION

| **USA** | |
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| TSCA Status: | Parts of ingredients in the product are listed on the TSCA inventory. |
| SARA Title III: | None |
| Sec. 302: | None |

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| Sec: 304: | None |
| Sec.311/312: | None |
| Sec. 313: | None |
| CERCLA RQ: | None |
| California Prop 65 | Warning: This product contains Nickel, a chemical known to the state of California to cause cancer and reproductive harm. |
| **European Union** | |
| Classification for the Substance/Preparation | This product is not classified as hazardous according to Regulation (EC) No. 1272/2008. Keep out of the reach of children |
| **International** | |
| IATA | This product meets all IATA Dangerous Goods Regulations (DGR) – up to 65th edition |
| IMDG Code | This product meets all requirements of IMDG Code up to 39-18 |

| **NFPA** | **Health Hazards** | **Flammability** | **Instability** | **Special Hazards** |
|---|---|---|---|---|
| | Not determined | Not determined | Not determined | Not determined |
| **HMIS** | **Health Hazards** | **Flammability** | **Physical Hazards** | **Personal Protection** |
| | Not determined | Not determined | Not determined | Not determined |

## SECTION16: OTHER INFORMATION

The above information is believed to be correct but does not purport to be all-inclusive and shall be used only as a guide.

**DISCLAIMER:**

**ALL PERSONS USING THIS PRODUCT, ALL PERSONS WORKING IN AN AREA WHERE THIS PRODUCT IS USED, AND ALL PERSONS HANDLING THIS PRODUCT SHOULD BE FAMILIAR WITH THE CONTENTS OF THIS DATA SHEET. THIS INFORMATION SHOULD BE EFFECTIVELY COMMUNICATED TO EMPLOYEES AND OTHERS WHO MIGHT COME IN CONTACT WITH THE PRODUCT.**

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