LIONTRON LITHIUM BATTERIES

MSDS REPORT

SECTION 1 – PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Lithium Iron Phosphate LiFePO4 Traction Battery System
Model:	LIONTRON LX48-100 - 48V 100Ah
EAN Code:	4260586371086
Item Code:	LIST48100
Specification:	5120Wh, 100Ah, 51.2V
Weight:	43.6 kg
Dimensions:	618 x 430 x 133mm (LxWxH)
Manufacturer:	Liontron GmbH & Co. KG
Address:	Bahnstraße 29, 47929 Grefrath, Germany
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SECTION 2 – HAZARDS IDENTIFICATION

Classification of Danger:	See section 14.
Primary Route(s) of Exposure:	Eye, skin contact, ingestion
Health Hazard:	The batteries are not hazardous when used according to the instructions of manufacturer under normal conditions. In case of abuse, there's Hazard of rupture, fire, heat, leakage of internal components, which could cause casualty loss. Abuses including but not limited to the following cases: charged for long time, short circuited, put into fire, whacked with hard object, punctured with acute object, crushed, and broken.

SECTION 3 – COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Concentration (%)	CAS Number
Iron Lithium Phosphate (LiFePO4)	20 - 40	15365-14-7
Graphite	10 - 20	7782-42-5
Iron	10 - 20	7439-89-6
Aluminum Foils	5 - 10	7429-90-5
Copper Foils	1 - 10	7440-50-8
Nickel	1 - 5	7440-02-0
Other	1 – 5	N/A

Labeling according to EC directives. No symbol and Hazard phrase are required.
Note: CAS number is Chemical Abstract Service Registry Number. N/A=Not apply

SECTION 4 – FIRST AID MEASURES

Eye contact	Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin contact	Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Get medical aid
Inhalation	Remove from exposure and move to fresh air immediately. Use oxygen if available.
Ingestion	Give at least 2 glasses of milk or water. Induce vomiting unless patient is unconscious. Call a physician.

SECTION 5 – FIRE FIGHTING MEASURES

Characteristics of Hazard	Dusts at sufficient concentrations can form explosive mixtures with air. Combustion generates toxic fumes.
Hazardous Combustion Products	Carbon dioxide.
Fire-extinguishing Methods and Extinguishing Media	For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.
Attention in Fire-extinguishing	Wear self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Personal Precautions, protective equipment, and emergency procedures	In case of rupture. Attention! Corrosive material. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Refer to protective measures listed in Sections 7 and 8.
Environmental Precautions	Prevent product from contaminating soil and from entering sewers or waterways.
Methods and materials for Containment	Stop the leak if safe to do so. Contain the spilled liquid with dry sand or earth. Clean up spills immediately.
Methods and materials for cleaning up	Absorb spilled material with an inert absorbent (dry sand or earth). Scoop contaminated absorbent into an acceptable waste container. Collect all contaminated absorbent and dispose of according to directions in Section 13. Scrub the area with detergent and water; collect all contaminated wash water for proper disposal.

SECTION 7 – HANDLING AND STORAGE

Handling	The battery may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.
Storage	Store in a cool, dry, well-ventilated area away from incompatible substances. Store locked up. Keep out of the reach of children.
Other Precautions	In case of rupture. Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Use personal protection equipment.

SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls	Use adequate ventilation to keep airborne concentrations low. If used under conditions that generate particulates, the ACGIH TLV-TWA of 3mg/m3 respirable fraction (10mg/m3 total) should be observed.
Personal Protective Equipment	**Eye and Face Protection**: None required for consumer use. If there is a Hazard of contact: Tight sealing safety goggles. Face protection shield. **Skin and Body Protection**: None required for consumer use. If there is a Hazard of contact: Wear protective gloves and protective clothing. **Respiratory Protection**: No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Physical State

Appearance: Prismatic
Color: Black
Odour: If leaking, smells of medical ether.

Change in condition

pH	Not applicable as supplied.
Flash Point	Not applicable unless individual components exposed.
Flammability	Not applicable unless individual components exposed.
Relative density	Not applicable unless individual components exposed.
Solubility (water)	Not applicable unless individual components exposed.
Solubility (other)	Not applicable unless individual components exposed.

SECTION 10 – STABILITY AND REACTIVITY

Chemical Stability	Stable under recommended storage conditions.
Possibility of Hazardous Reactions	None under normal processing.
Conditions to Avoid	Exposure to air or moisture over prolonged periods.
Incompatible materials	Acids, Oxidizing agents, Bases.
Hazardous Decomposition Products	Carbon oxides.

SECTION 11 – TOXICOLOGICAL INFORMATION

Irritation	In the event of exposure to internal contents, vapour fumes may be very irritating to the eyes and skin.
Sensitization	Not Available.
Reproductive Toxicity	Not Available.
Toxicologically Synergistic Materials	Not Available.

SECTION 12 – ECOLOGICAL INFORMATION

General note	Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Anticipated behavior of a chemical product in environment/possible environmental impact/ ecotoxicity	Not Available.

SECTION 13 – DISPOSAL CONSIDERATIONS

Waste Treatment	Recycle or dispose of in accordance with government, state & local regulations.
Attention for Waste Treatment	Deserted batteries shouldn't be treated as ordinary trash. Shouldn't be thrown into fire or placed in high temperature. Shouldn't be dissected, pierced, crushed or treated similarly. Best disposal method is recycling.

SECTION 14 – TRANSPORT INFORMATION

UN number	3480
Proper shipping name	Lithium ion batteries (limited to a maximum of 30% SoC)
Class or division	9
Label(s) / Placard Required	Miscellaneous Lithium batt

Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises

ICAO / IATA	Can be shipped by air in accordance with International Civil Aviation Organization (ICAO), TI or International Air Transport Association (IATA), DGR Packing Instructions (PI) 965 Section IA appropriate of IATA DGR 63rd (2022 Edition) for transportation.
IMDG CODE	Shipping may be done in accordance with the IMDG Code 2020 Edition (Amdt 40-20).
DOT	Other requirements for the US Department of Transportation (DOT) Subchapter C, Hazardous Materials Regulations if shipped in compliance with 49 CFR 173.185.
ADR/ ADN	Transport Requirements for United Nations Economic Commission for Europe (UNECE) ADR/ADN, Applicable as from 1 January 2021

Each battery of the type declared in this document is proved to meet the requirements of each applicable test in the UN Manual of Tests and Criteria, Part III, Section 38.3

SECTION 15 – REGULATORY INFORMATION

- Dangerous Goods Regulations
- Recommendations on the Transport of Dangerous Goods-Model Regulations (21st revised edition)
- Recommendations on the Transport of Dangerous Goods-Manual of Tests and Criteria
- International Air Transport Association (IATA)
- International Maritime Dangerous Goods (IMDG Code 2020 Edition Amdt 40-20)
- Technical Instructions for the Safe Transport of Dangerous Goods
- Classification and code of dangerous goods (GB 6944-2012)
- 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)
- Toxic Substance Control Act (TSCA)
- Code of Federal Regulations
- In accordance with all Federal, State and local laws

SECTION 16 – ADDITIONAL INFORMATION

Avoid any mechanical or electrical abuse of the Lithium Iron Phosphate battery. Use and Install the battery accordance with the instruction manual.

Disclaimer: To the best of our knowledge, the information contained herein is accurate. However, neither the abovenamed supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist

END OF REPORT