Material Safety Data Sheet

Sample name:	**LiFePO4 Battery**
Sample model:	**RS25200**
Applicant:	**Rubix Battery LLC**

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** The MSDS is prepared based on the information provided by client. The contents and formats of this MSDS are revised as per client's request.*

Section 1–Chemical Product and Company Identification

Product Name	LiFePO4 Battery
Model	RS25200
Trade Mark	/
Ratings	25.6V/200Ah/5120Wh
Weight	47.300kg
Manufacturer	Rubix Battery LLC
Manufacturer Address	2310 Township Rd Sugarcreek Ohio 44681 330-231-9627
Emergency Telephone	330-231-9627
Fax	--

Section 2– Composition Information

Chemical Composition	**Chemical Formula**	**CAS No.**	**Weight (%)**
Lithium Iron Phosphate	$LiFePO_4$	15365-14-7	24
Graphite	C	7782-42-5	10 - 30
Lithium hexafluorophosphate	$LiPF_6$	21324-40-3	23
Copper	Cu	7440-50-8	7-13
Aluminium	Al	7429-90-5	5-10
Nickel	Ni	7440-02-0	1-5

Section 3– Hazards Identification

Emergency overview	N/A
Label elements:	

Hazard pictogram(s)	Not Applicable
Signal word	Not Applicable
Hazard statement(s)	Not Applicable
Precautionary statement(s):	
Prevention	Not Applicable
Response	Not Applicable
Disposal	Not Applicable
Environmental hazards:	No relevant information
Important symptoms:	See section 11 for more information

Section 4- First Aid Measures

Eye contact	Flush eyes with plenty of water for 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

Flash Point	Not Applicable
Auto-Ignition Temperature	Not Applicable
Extinguishing Media	Hydrocarbon surfactant, CO_2
Special Fire-Fighting Procedures	Self-contained breathing apparatus
Unusual Fire and Explosion Hazards	Cell may vent when subjected to excessive heat-exposing battery contents
Hazardous Combustion Products	Carbon monoxide, carbon dioxide, lithium oxide fumes.

Section 6- Accidental Release Measures

Personal precautions, protective equipment and emergency procedures:

If the battery is released, remove personnel from area until fumes dissipate. Provide maximum ventilation to clear out hazardous gases. The preferred response is to leave the area and allow the vapors to dissipate, Avoid skin and eyes contact or inhalation of vapors. Remove spilled liquid with absorbent and incinerated. If leakage of the battery happens, liquid could be absorbed by using sand, earth or other inert substance and contaminated area should be ventilated meantime.

Environment precautions:

Do not allow product to reach sewage system or any water source.

Inform respective authorities in case of seepage into water course or sewage system.

Do not allow to enter sewers/ surface or ground water.

Methods and material for containment and cleaning up:

If battery casing is dismantled, small amounts of electrolyte may leak. Collect all released material in a plastic lined container. Dispose off according to the local law and rules, Avoid leached substances to get into the earth, canalization or waters.

Section 7- Handling and Storage

Handling	The battery should not be opened, destroyed or incinerate, since they may leak or rupture and release to the environment the ingredients that they contain in the hermetically sealed container. Do not short circuit terminals, or over charge the battery, forced over-discharge, throw to fire. Do not crush or puncture the battery, or immerse in liquids.
Storage	Avoid mechanical or electrical abuse. Storage preferably in cool, dry and ventilated area, which is subject to little temperature change. Storage at high temperatures should be avoided. Do not place the battery near heating equipment, nor expose to direct sunlight for long periods.
Other Precautions	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.

Section 8- Exposure Controls/Personal Protection

Engineering Controls	Use local exhaust ventilation or other engineering controls to control sources of dust, mist, fumes and vapor. Keep away from heat and open flame. Store in a cool, dry place.

Personal Protective Equipment	Respiratory Protection：Not necessary under normal conditions. Skin and body Protection：Not necessary under normal conditions，Wear suitable protective clothing and gloves if handling an open or leaking battery. Hand protection：Wear suitable gloves if handling an open or leaking battery. Eye Protection：Not necessary under normal conditions，Wear safety glasses if handling an open or leaking battery.
Other Protective Equipment	Have a safety shower and eye wash fountain readily available in the immediate work area.
Hygiene Measures	Do not eat，drink，or smoke in work area. Maintain good housekeeping.

Section 9- Physical and Chemical Properties

Color	Black
Odour	Not Applicable
pH	Not Applicable
Melting point/freezing point	Not Applicable
Boiling Point and Boiling range	Not Applicable
Flash Point	Not Applicable
Upper/lower flammability or explosive limits	Not Applicable
Vapor Pressure	Not Applicable
Vapor Density	Not Applicable
Relative density	Not Applicable
Solubility in Water	Not Applicable
Auto-ignition temperature	Not Applicable
Decomposition temperature	Not Applicable
Evaporation rate	Not Applicable

Flammability（soil，gas）	Not Applicable
Viscosity	Not Applicable

Section 10- Stability and reactivity

Stability	The product is stable under conditions described Section 7
Conditions to Avoid	Heat above 70°C or incinerate. Deform，Mutilate，Crush，Disassemble，Overcharge，Short circuit，Expose over a long period to humid conditions.
Incompatible Materials	Oxidizing agents，acid，base.
Hazardous Decomposition Products	Carbon monoxide，carbon dioxide，lithium oxide fumes.
Possibility of Hazardous Reaction	Not Applicable

Section 11 - Toxicological Information

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.
Sensitization	Not Applicable
Neurological Effects	Not Applicable
Teratogenicity	Not Applicable
Reproductive Toxicity	Not Applicable
Mutagenicity（Genetic Effects）	Not Applicable
Toxicologically Synergistic Materials	Not Applicable

Section 12- Ecological Information

Ecological Toxicity	Not Applicable
Mobility in soil	Not Applicable
Persistence and Degradability	Not Applicable

Bioaccumulation potential	Not Applicable
Other Adverse Effects	Not Applicable

Section 13- Disposal Considerations

Product disposal recommendation	Observe local, state and federal laws and regulations.
Packaging disposal recommendation	Disposal must be made according to official regulations

Section 14 - Transport Information

Label for conveyance	Lithium Battery Label	
UN Number	UN 3480 or UN 3481	
Transport hazard class(es)	9	
Packing group	965 or 966	II
	967	--
Marine pollutant	No	
UN Proper shipping name	Lithium ion Batteries（Including lithium ion polymer batteries） Lithium ion Batteries packed with equipment（Including lithium ion polymer batteries） Lithium ion Batteries contained in equipments（Including lithium ion polymer batteries）	
ICAO/IATA	Can be shipped by air in accordance with international Civil Aviation Organization (ICAO), TI or International Air Transport Association (IATA) DGR 65th Packing Instructions Section IA of 965 or Section I of 966～967 appropriately.	
IMDG CODE	International Maritime Dangerous Goods Code IMDG CODE (Amdt 41-22)	
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road	

RID	Regulations concerning the International Carriage of Dangerous Goods by Rail

The dangerous goods regulations require that each battery design be subject to tests contained in Section 38. 3 of the UN Manual of Tests and Criteria prior to being offered for transport.

Section 15- Regulatory information

Law information

《Dangerous Goods Regulations》

《Recommendation on the Transport of Dangerous Goods Model Regulations》

《International Maritime Dangerous Goods》

《Technical Instructions for the Safe Transport of Dangerous Goods》

《Classification and code of dangerous Goods》

《Consumer Product Safety Act》（CPSA）

《Federal Environmental Pollution Control Act》（FEPCA）

《Resource Conservation and Recovery Act》（RCRA）

《European Agreement concerning the International Carriage of Dangerous》

《Regulations concerning the International Carriage of Dangerous》

In according with all Federal, State and local laws.

Section 16- Other Information

The information above is believed to be accurate and represents the best information currently available to us. However, this document makes no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. Although reasonable precautions have been taken in the preparation of the data contained herein, it is offered solely for your information, consideration and investigation. This material safety data sheet provides guidelines for the safe handling and use of this product; it does not and cannot advise on all possible situations, therefore, your specific use of this product should be evaluated to determine if additional precautions are required.

-- **End of Report** --