MATERIAL SAFETY DATA SHEET

Material Safety Data Sheet

SAMPLE INFORMATION:

1. Sample Description: Lithium Battery
2. Brand Name: Energy-Research
3. Sample Model: ER-Power Buddy 24V / 100AH-LFP
4. Manufacturer: Energy Research Institute B.V.
5. Manufacturer Address: Oude Haagseweg 47C, 1066BV Amsterdam, The Netherlands
6. Suggest use and restricted: Used for power supply of motor and inverter

CLIENT INFORMATION

1. Applicant: Energy Research Institute B.V.
2. Applicant Address: Oude Haagseweg 47C, 1066BV Amsterdam, The Netherlands

TEST INFORMATION:

1 Applicant No: 191124302
2 Test Items and Request: MATERIAL SAFETY DATA SHEETS
3 Date of Receipt: Nov 27, 2019
4.Date of Test: NOV.27'30, 2019

SUMMARY:

As per request, the contents and formats of the MSDS are prepared in accordance With European Commission Directives 67/548/EEC, 1999/45/EC, Regulation (EC) No 1907/2006, Regulation (EC) No 1272/2008 and Regulation (EU) No 453/2010, and is provided per attached

REMARKS:

1. The MSDS is prepared based on the information provided by client.
2.This sample is likely to be classified as article with substances not intended to be released and is out of scope of a MSDS as set out in Regulation (EC) No 1907/2006. This MSDS is generated for client's reference only.

MATERIAL SAFETY DATA SHEET

Section 1 - Identification of the substance /preparation and of the company/ undertaking

Identification of the preparation:	Lithium Battery
Company Identification:	Energy Research Institute B.V.
Company Address:	Oude Haagseweg 47C, 1066BV Amsterdam, The Netherlands
Tel:	+31206448822
Emergency Contact No.:	+31206448822
E-mail:	sales@energy-research.com

Section 2 - Hazards Identification

Preparation hazards and classification	Not dangerous with normal use. The battery should not be disassembled or incinerated. Exposure to the ingredients contained within or their combustion products could be harmful
Appearance, Color and Odor	Solid object with no oder.
Primary Route(s) of Exposure	Risk of exposure will only occur if the battery or cell is mechanically, thermally or electrically abused and the enclosure is compromised. If this occurs, exposure to electrolyte solutions contained within the battery or cell may occur by inhalation, eye contact, skin contact and ingestion
Potential Health Effects	Inhalation: Inhalation of material from a sealed battery is not an expected route of exposure. Vapors or mists from a ruptured battery may cause respiratory irritation. Ingestion: Swallowing of material from a sealed battery is not an expected route of exposure. Swallowing mists from a ruptured battery may cause respiratory irritation, chemical burns of the mouth and gastrointestinal tract irritation. Skin: Contact between the battery and skin Will not cause any harm. Skin contact with positive and negative terminals of high voltages may cause burns to the skin. Skin contact With a ruptured battery can cause skin irritation. Eye: Contact between the battery and eye Will not cause any harm. Eye contact with the contents of a ruptured battery can cause severe irritation to the eye.
Medical conditions aggravated by exposure	Not applicable
Reported as carcinogen	Not applicable

MATERIAL SAFETY DATA SHEET

Section 3 - Composition/ Information on Ingredients

Hazardous Ingredients (Chemical Name)	Concentration or concentration ranges (%)	CAS Number
Phosphoric acid, iron (2+) lithium salt (1:1:1)	40. 85-42. 85%	15365-14-7
Graphite	11. 27-13.27%	7782-42-5
Copper	9. 11-10. 11%	7440-50-8
Polyethylene	0. 02-0. 05%	9002-88-4
Stainless steel	23. 02-25. 02%	12597-68-1
PVC (chloroethylene, polymer)	0. 54-0. 84%	9002-86-2
Tin	0. 49-0. 69%	7440-31-5
Phosphate (1-), hexafluoro-, lithium	0. 2-0.5%	21324-40-3
Propylene carbonate	3. 5-4. 5%	108-32-7
Dimethyl carbonate	11. 0-12. 0%	616.38-6

Note: CAS number is Chemical Abstract Service Registry Number.
N/A: Not apply.

Section 4 - First Aid Measures

Inhalation	Move the victim to fresh air and remove source of contamination from area. Seek medical attention.
Skin contact	Wash affected area with lukewarm water for at least 30 minutes If irritation or pain persists, seek medical attention
Eye contact	If eye contact with contents of an open battery occurs, immediately flush the contaminated eye(s) with lukewarm, gently flowing water for at least 30 minutes while holding the eyelids open. Neutral saline solution may be used as soon as it is available. If necessary, continue flushing during transport to emergency care facility. Take care not to rinse contaminated water into the unaffected eye or onto face. Quickly transport the victim to an emergency care facility.
Ingestion	If ingestion of contents of an open battery occurs, never give anything by mouth if the victim is rapidly losing consciousness, or is unconscious or convulsing. Have the victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Have the victim drink 60 to 240 ml (2-8 oz.) of water. If vomiting occurs naturally, have the victim lean forward to reduce risk of aspiration. Have the victim rinse mouth with water again. Quickly transport Victim to an emergency care facility.

MATERIAL SAFETY DATA SHEET

Section 5 - Fire-Fighting Measures

Flammable properties	1n the event that this battery has been ruptured, the electrolyte properties solution contain within the battery would be flammable. Like any sealed container, battery cells may rupture when exposed to excessive heat: this could result in the release of flammable or corrosive materials.
Suitable extinguishing media	Use extinguishing media suitable for the materials that are burning.
Unsuitable extinguishing media	Not available
Explosion Data	Sensitivity to Mechanical Impact: This may result in rupture in extreme cases Sensitivity to Static Discharge: Not Applicable
Specific Hazards arising from the chemical	Fires involving battery can be controlled with water. When water is used, however, hydrogen gas may evolve. In a confined space hydrogen gas can form an explosive mixture. In this situation, smothering agents are recommended to extinguish the fire.
Protective equipment and precautions for firefighters	As for any fire, evacuate the area and fight the fire from a safe distance. Wear a pressure-demand, self-contained breathing apparatus and full protective gear. Fight fire from a protected location or a safe distance. Use NIOSH/MSHA approved full-face self-contained breathing apparatus (SCBA) with full protective gear.
NFPA	NFPA Health: 0 Flammability: 0 Instability: 0

Section 6 - Accidental Release Measures

Personal Precautions, protective equipment, and emergency procedures	Restrict access to area until completion of Clean-up. Do not touch the spilled material. Wear adequate personal protective equipment as indicated in Section 8.
Environmental Precautions	Prevent material 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.

MATERIAL SAFETY DATA SHEET

Section 7 - Handling and Storage

Handling	Do not dismantle, open or shred battery; Don't touch battery with metalwork. Do not open, dissemble, crush or burn battery. Ensure good ventilation/ exhaustion at the workplace. Prevent formation of dust. Information about protection against explosions and fires: Keep ignition sources away - Do not smoke
Storage	When stored for a long time, polymer lithium-ion batteries should remain charged at 40% or 60%, stored in a cool, dry state. Dry, ventilated places, high temperatures may lead to battery performance loss, leakage, or battery rust. Don't expose the battery. Under open fire, store away from moisture.

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 neoprene or nitrile rubber gloves if handling an open or leaking battery. Hand protection: Wear neoprene or natural rubber material 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

MATERIAL SAFETY DATA SHEET

Section 9 - Physical and Chemical Properties

Physical state	Form: Solid	
	Color: Black	
	Odour: odourless	
Change in condition:		
pH, with indication of the concentration		Not applicable
Melting point/freezing point		Not applicable
Boiling point, initial 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 (Air = 1)		Not applicable
Density/relative density		Not applicable
Solubility in water		Not applicable
N-octanol/water partition coefficient		Not applicable
Auto-ignition temperature		Not applicable
Decomposition temperature		Not applicable
Odour threshold		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 normal conditions.
Conditions to Avoid (e.g. static discharge, shock or Vibration)	Do not subject lithium battery to mechanical shock. Vibration encountered during transportation does not cause leakage fire or explosion. Do not disassemble, crush, short or install with incorrect polarity. Avoid mechanical or electrical abuse
Incompatible Materials	Not Available
Hazardous Decomposition Products	This material may release toxic fumes if burned or exposed to fire.
Possibility of Hazardous Reaction	Not Available

MATERIAL SAFETY DATA SHEET

Section 11 - Toxicological Information

Irritation	Risk of irritation occurs only if the cell is mechanically, thermally OI electrically abused to the point of compromising the enclosure. If this occurs, irritation to the skin, eyes and respiratory tract may occur.
Sensitization	Not Available
Neurological Effects	Not Available
Teratogenicity	Not Available
Reproductive Toxicity	Not Available
Mutagenicity (Genetic Effects)	Not Available
Toxicologically Synergistic Materials	Not Available

Section 12 - Ecological Information

General note:	Water hazard class 1(Self-assessment): slightly hazardous for water. 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
Mobility in soil	Not Available
Persistence and Degradability	Not Available
Bioaccumulation potential	Not Available
Other Adverse Effects	Not Available

Section 13 - Disposal Considerations

Product disposal recommendation: Observe local, state and federal laws and regulations. Packaging disposal recommendation: Be aware discarded battery may cause fire. Tape the battery terminals to insulate them. Don't disassembly the battery. Completely discharge containers (no tear drops, no powder rest, scraped carefully). Containers may be recycled or re-used. Observe local, state and federal laws and regulations. The potential effects on the environment and human health of the substances used in battery and accumulators; the desirability of not disposing of waste batteries and accumulators as unsorted municipal waste and of participating in their separate collection to facilitate treatment and recycling.

MATERIAL SAFETY DATA SHEET

Section 14 - Transport Information

This report applies to by sea, by air and by land:
The lithium battery tested according to the requirements of the UN manual of tests and Criteria, Part III, subsection 38.3;
The lithium battery according to Section ll/Section IB of PACKING INSTRUCTION 965, or Section II of PACKING INSTRUCTION 966-967 of the 2019 IATA Dangerous Goods regulations 60th Edition may be transported. And applicable U.S. DOT regulations for the safe transport of lithium battery.
The lithium battery was protected to prevent short circuits. This includes protection against contact with conductive materials Within the same packaging that could lead to short circuit;
The packaging shall be adequate to avoid mechanical damage during transport handling and stacking. The materials and pack design shall be chosen to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of moisture
Each package must be labeled with a Lithium battery mark and the UN code height is not less than 12mm, or in addition to the UN Class 9 hazard label about transport, the following regulations are cited and considered:
- The International Civil Aviation Organization (lCAO) Technical Instructions.
- The International Air transport Association (IATA) Dangerous Goods Regulations.
UN number of lithium battery: UN3480 or UN3481;
UN Proper shipping name/Description (technical name): Lithium ion batteries or Lithium ion batteries contained in equipment (including lithium polymer battery)
UN Classification (Transport hazard class): Non dangerous;
Marine pollutant(Y/N): N;
- The International Maritime Dangerous Goods (IMDG) Code.
For lithium battery by sea, provided that packaging is strong and prevent the products from short-circuit
UN number of lithium battery: UN3480 or UN3481;
UN Proper shipping name/Description (technical name): Lithium ion batteries or Lithium ion batteries contained in equipment (including lithium polymer battery)
UN Classification (Transport hazard class): Non dangerous;
Marine pollutant(Y/N): Y;
Special Provision: International maritime dangerous goods code (lMDG) 188, 230, 310, 348, 957;
- The US Hazardous Materials Regulation (HMR) pursuant to a final rule issued by RSPA
- The Office of Hazardous Materials Safety Within the US Department of Transportations'(DOT) Research and Special Programs Administration (RSPA).

MATERIAL SAFETY DATA SHEET

Section 15 - Regulatory Information

OSHA hazard communication standard (29 CFR 1910.1200)

_____Hazardous _____X____Non-hazardous

Section 16 - Other Information

The information above is believed to be accurate and represents the best information currently available to us. However, concorde 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

The data/information contained herein has been reviewed and approved for general release on the basis that this document contains no export controlled information.

***** (END OF REPORT) *****