Safety Data Sheet

according to CLASS Regulations 2013 (GHS)

Printing Date: 10/5/2017 Revision: 10/5/2017

1 Identification

. Product identifier

. Trade name: BATTERY PACK – LITHIUM ION

. Product code:

. Recommended use and restriction on use

. Recommended use: Motive Power Battery Systems

. Restrictions on use: Contact Manufacturer

. Details of supplier of the Safety Data Sheet

. Manufacturer/ Supplier:

2121 East Boulevard
Kokomo, IN 46902

Tel / Fax: +1 502 416 1060 / +1 708 850 4985

· Emergency telephone number:

ChemTel Inc.
+1 (800)255-3924, +1 (813)248-0585

2 Hazard identification

· Classification of the substance or mixture

The product is not classified as hazardous according to the Globally Harmonized System (GHS).

· Additional information:

Note: Leaking cells pose health hazards: see Sections 4 and 11. Intentional abuse of cells or batteries increases the risk of harm or damage to the product, to the user, and to surrounding materials and personnel. Do not attempt to open sealed cells or batteries. Do not intentionally short-circuit cells or batteries. Do not expose these products to temperatures exceeding the maximum manufacturers rating. Do not dispose of cells/batteries in landfills. Please follow all manufacturer guidelines in the use, storage, and disposal of these products. Consult manufacturer in cases of questions involving specific product usage.

Exposure to product contents is highly unlikely during normal usage.

Adverse health effects are not reasonably expected from normal use of product.

· Label elements

· GHS label elements This product does not have a classification according to the GHS regulation.

· Hazard pictograms: Not regulated.

· Signal word: Not regulated.

· Hazard determining components of labeling: None.

· Hazard statements: Not regulated.

· Precautionary statements: Not regulated.

· Other hazard There are no other hazard not otherwise classified that have been identified.

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3 Composition/information on ingredients

. Substance: Lithium Ion Battery

. CAS Number: Not specified

. Cases: N/A Not dangerous

. Printed Circuit Board Assembly: Not Dangerous

. Lithium Ion Cell: CALB CA100 / CA180 / LF105

· Dangerous components (in electrolyte) with CAS No. & Identification:		**%w/w**
15365-14-7	Lithium Iron Phosphate	31%
	Not Classified	
7782-42-5	Graphite	18%
	Not Classified	
7440-50-8	Copper	12%
	Not Classified	
7429-90-5	Aluminum	8%
	Not Classified	
21324-40-3	Lithium hexafluorophosphate	4%
	 Acute tox. 3, H301;  STOT RE 1, H372;  Skin Corr. 1A, H314; Eye Dam. 1, H318	
-	Carbonate	8%
	No data available	
9003-07-0	Polypropylene	19%
	Not Classified	

· Additional information:

Batteries are classified as an article under GHS.

Dangerous components are for electrolytes contained in the battery, where direct contact is not possible.

There is no exposure to hazardous ingredients during use.

The exact percentages are being withheld as a trade secret. For the wording of the listed Hazard Statements refer to section 16.

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4 First-aid measures

· **Description of first aid measures**

· **General information:**

Information references exposures to battery contents, and not exposures to whole units. Exposures to whole units are unlikely to produce health hazards.

· **After inhalation:**

Electrolyte solution spill: unlikely route of exposure.

Supply fresh air; consult doctor in case of complaints.

· **After skin contact:**

Electrolyte solution spill: Unlikely route of exposure.

Immediately remove contaminated clothing. Rinse skin with water for at least 30 minutes.

If skin irritation continues, consult a doctor.

· **After eye contact:**

Electrolyte solution spill: Unlikely route of exposure. Eye contact can cause eye burns. Immediately remove contact lenses if possible. Rinse opened eye for at least 30 minutes under running water. Take care not to rinse contaminated water into the other eye. Then transport victim to emergency care facility as soon as possible.

· **After swallowing**: Do not induce vomiting; immediately call for medical help. Rinse mouth with water if conscious. IF vomiting naturally, lean victim forward to reduce risk of aspiration.

· **Most important symptoms and effects, both acute and delayed:** No relevant information available.

· **Indication of any immediate medical attention and special treatment needed:**

Note to Physician: Published reports recommend removal from the esophagus be done endoscopically (under direct visualization). Batteries beyond the esophagus need not be retrieved unless there are signs of injury to the GI tract or a large diameter battery fails to pass the pylorus. If asymptomatic, follow-up x- rays are necessary only to confirm the passage of larger batteries. Confirmation by stool inspection is preferable under most circumstances. Various corrosive, harmful or toxic substances are possible in certain cases. These substances may include lithium salts; specific antidotes may be required in cases of ingestion for lithium salts and in cases of oral/dermal/inhalation contact with carbonates.

5 Fire-fighting measures

· **Extinguishing media**

· **Suitable extinguishing agents:**

Small fires: Dry chemical, CO2, water spray or regular foam.

Large fires: Water spray, fog or regular foam. Move unaffected containers away from fire if safe to do so.

· **For safety reasons unsuitable extinguishing agents:** Not applicable.

· **Special hazards arising from the substance or mixture**

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.

· **Advice for firefighters**

· **Protective equipment:**

Use self-contained breathing apparatus and full fire-fighting protective clothing.

· **Additional information:** The interaction of water or water vapor and exposed lithium hexafluoro phosphate (Li PF6) may result in the generation of hydrogen and hydrogen fluoride (HF) gas. Fire will produce irritating, corrosive and/or toxic gases. Fumes may cause dizziness or suffocation.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures:**

If battery material is released, remove personnel away from area until fume dissipate. Provide maximum ventilation to clear out hazardous gases. Contain the spilled liquid with cloth, dry sand or earth.

· **Environmental precautions:** Prevent from contaminating soil and from entering sewers or waterways.

· **Methods and material for containment and cleaning up:**

Use inert material (dry sand or earth) to absorb electrolyte and scoop up. 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.

· **Reference to other sections:**

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

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7 Handling and storage

· **Handling**

· **Precautions for safe handling:**

DO NOT INCINERATE, DESTROY, OR ATTEMPT TO OPEN SEALED CELLS OR BATTERIES - BATTERY CONTENTS MAY PRESENT SERIOUS SAFETY AND HEALTH HAZARDS. SHORT-CIRCUITING THE TERMINALS OF A DEVICE MAY RESULT IN DAMAGE TO DEVICE AND ANY NEARBY OBJECTS OR PERSONNEL. Keep cells away from temperatures outside the range of -40°C to 80°C.

· **Information about protection against explosions and fires:**

Lithium ion batteries contain flammable liquid electrolyte that may vent, ignite and produce sparks when subjected to high temperatures (> 150 °C (302 °F).

· **Conditions for safe storage, including any incompatibilities**

· **Storage**

· **Requirements to be met by storerooms and receptacles:**

Store in a cool, dry, well-ventilated place. Do not use or store near open flame. Avoid extreme temperatures. Store individual batteries or cells only in approved packaging in order to avoid inadvertent short circuits as this may result in damage to device, nearby objects, personnel, or all of the above.

· **Information about storage in one common storage facility**: Protect from direct sunlight for long periods, or water, high humidity.

· **Further information about storage conditions:** Store in dry conditions.

· **Specific end use(s):** No relevant information available.

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8 Exposure controls/personal protection

· **Control parameters**

· Airborne exposures to hazardous substances are not expected when product is used for its intended purpose.

Components with limit values that require monitoring at the workplace:	
Components with limit values that require monitoring at the workplace	
PEL (USA)	Long-term value: 15 mppcf* mg/m³
	*impinger samples counted by light field techn.
PEL (USA)	Long-term value: 2.5* mg/m³
	*respirable dust
REL (USA)	Long-term value: 2* mg/m³
	all forms except graphite fibers; *resp. fraction

· **Exposure controls**

· **Personal protective equipment:**

Not necessary under normal conditions.

· **General protective and hygienic measures:**

No special measures required.

· **Engineering controls:**

Use local exhaust ventilation or other engineering controls to control sources of dust.

· **Breathing equipment:**

Not necessary under normal conditions.

For spills, respiratory protection may be advisable.

· **Protection of hands:**

Not necessary under normal conditions. Wear neoprene or natural rubber gloves if handling a open or leaking cell.

The glove material must be impermeable and resistant to the product/ the substance/ the preparation.

· **Eye protection:**

Not necessary under normal conditions. Wear safety glasses if handling an open or leaking cell.

· **Other protection:**

Not necessary under normal conditions. If 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.

· **Hygiene measures:** Do not eat, drink or smoke in work areas. Maintain good housekeeping.

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9 Physical and chemical properties

· Information on basic physical and chemical properties	
· Appearance: Form: Color: · Odor: · Odor threshold	Battery cell Solid According to product specification Odorless Not determined
· pH-value: · Melting point/Melting range: · Boiling point/Boiling range:	Not applicable Not applicable Not applicable
· Flash point:	Not applicable
· Flammability (solid, gaseous):	Not applicable
· Auto-ignition temperature:	Not applicable
· Decomposition temperature:	Not determined
· Auto igniting:	Product is not self-igniting
· Danger of explosion:	Do not throw in fire or misuse, as a gas containing hydrogen and oxygen can be generated through the vent.
· Explosion limits Lower: Upper:	 Not applicable Not applicable
· Vapor pressure:	Not applicable
· Density: · Relative density: · Vapor density: · Evaporation rate:	Not applicable Not applicable Not applicable Not applicable
· Solubility in I Miscibility with Water:	 Insoluble
· Partition coefficient (n-octanollwater):	Not applicable
· Viscosity Dynamic: Kinematic: · Other information	 Not applicable Not applicable No relevant information available

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10 Stability and reactivity

· **Reactivity:** No relevant information available.

· **Chemical stability:**

Sealed and normally functioning power cells are considered stable.

· **Thermal decomposition I conditions to be avoided:**

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.

· **Possibility of hazardous reactions:**

Not available

· **Conditions to avoid:** Excessive heat.

· **Incompatible materials:** Do not immerse in water or other high conductivity liquids.

· **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.

11 Toxicological information

· **Information on toxicological effects**

· **Toxicity data:**

Acute oral, dermal and inhalation toxicity data are not available for this article.

The sealed Li-Ion cells as a product are not presenting toxicological hazards.

· **Other toxicity data:** 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.

· **Probable route(s) of exposure** (in case of electrolyte spills):

Skin contact.

Eye contact.

Ingestion.

· **Delayed and immediate effects:**

None from normal handling. Symptoms only seen in exposure to leaking articles.

· **Repeated dose toxicity:** From product as supplied: None.

· **CMR effects (carcinogenity, mutagenicity and toxicity for reproduction)**

· **Carcinogenicity:** Based on available data, the classification criteria are not met.

· **Reproductive toxicity:** Based on available data, the classification criteria are not met.

· **STOT-single exposure:** Based on available data, the classification criteria are not met.

· **STOT-repeated exposure:** Based on available data, the classification criteria are not met.

· **Aspiration hazard:** Based on available data, the classification criteria are not met.

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12 Ecological information

· **Toxicity**

· **Aquatic toxicity:** Not available.

· **Persistence and degradability:** Not readily biodegradable

· **Bioaccumulative potential:** Not available.

· **Mobility in soil:** Not available.

· **Additional ecological information**

· **General notes:** Avoid release to the environment.

· **Results of PBT and vPvB assessment**

· **PBT:** Not applicable.

· **vPvB:** 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.

13 Disposal considerations

· **Waste treatment methods**

· **Recommendation:**

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.

The user of this material has the responsibility to dispose of unused material, residues and containers in compliance with all relevant local, state and federal laws and regulations regarding treatment, storage and disposal for hazardous and nonhazardous wastes.

· **Uncleaned packaging**

· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

This lithium-ion cells and 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 56th edition and applicable U.S. DOT regulations for the safe transport of lithium-ion batteries and the International Maritime Dangerous Goods Code. Each of the listed cells in Section 1 has passed the UN Manual of Tests and Criteria Part III Subsection 38.3, which is required by all of the directives listed above.

International shipments of lithium ion cells and batteries are generally classified as:

Proper shipping name: LITHIUM ION BATTERIES

Hazard Class: 9

UN No: UN3480

Packing Group: II

by the International Civil Aviation Organization (ICAO), International Air Transport Association (IATA) and the International Maritime Dangerous Goods (IMDG) Code. Packaging, markings and documentation requirements are defined in the International Air Transport Association (IATA) Dangerous Goods Regulations (DGR) PI 967 and PI P903 of the IMDG Code.

In the US, proper shipping name: LITHIUM ION BATTERIES
Hazard Class: 9
UN No: UN3480
Packing Group: II

by the U.S. Hazardous Materials Regulations (HMR). Packaging, markings and documentation requirements are defined in Title 49 of the Code of Federal Regulations (CFR), Section 173.185 of the U.S. HMR. Excepted cells and batteries are allowed to be transported within the US without Class 9 packaging and markings, but must conform to other requirements as stipulated in the 49 CFR Section 173.185 of the U.S. HMR.

15 Regulatory information

· Safety, health and environmental regulations/legislation specific for the substance or mixture

For Malaysia

These batteries are not considered as chemicals under CLASS Regulation 2013. It is considered an article, which under normal conditions of use, does not release significant quantities of hazardous chemicals.

Date of issue of the transport regulations: ADR 2015, RID 2015, IATA 2015 (56th edition), IMDG 2014, DOT / 49 CFR 2015.

For USA

Safety Data Sheets are a sub-requirement of the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, 29 CFR Subpart 1910.1200. This Hazard Communication Standard does not apply to various subcategories including anything defined by OSHA as an "article". According to OSHA, Article means a manufactured item other than a fluid or particle: (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g., minute or trace amounts of a hazardous chemical (as determined under paragraph (d) of this section), and does not pose a physical hazard or health risk to employees. Because all of our batteries are defined as "articles", they are exempted from the requirements of the Hazard Communication Standard.

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For European Union

These batteries are not “substances” or “mixtures” according to Regulation (EC) No 1907/2006 EC. Instead they have to be regarded as “articles”, no substances are intended to be released during handling. Therefore there is no obligation to supply a “safety data sheet according to Regulation (EC) 1907/2006, Article 31”.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Date of preparation / last revision** 2/15/2017 / Revision 0

· **Abbreviations and acronyms:**

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
CAS: Chemical Abstracts Service (division of the American Chemical Society)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
Acute Tox. : Acute toxicity
Skin Corr. : Skin corrosion/irritation
Eye Dam : Eye damage
Eye Irrit : Eye irritation
Flam. Liq : Flammable liquid
STOT RE: Specific target organ toxicity Repeated Exposure

Full text of Hazard Statements referred to under section 3

H225 Highly flammable liquid and vapour
H226 Flammable liquid and vapour
H301 Toxic if swallowed
H314 Causes severe skin burns and eye damage
H315 Causes skin irritation
H318 Causes serious eye damage
H319 Causes serious eye irritation
H372 Causes damage to organs through prolonged or repeated exposure
H373 May cause damage to organs through prolonged or repeated exposure