ALEXANDER

BATTERY TECHNOLOGIES

MATERIAL SAFETY DATA SHEET

Date: 01 January 2021

1. Product and company information

Product name: TR-332 Rechargeable Batteries Battery Pack, Lithium Ion

Production code: 78-8150-0831-9

Production model: TR-332

Typical Capacity: 4.8Ah

Typical Voltage: 11.1V

Chemistry: LI-ION

Names of the manufacturer or supplier:
Alexander Technologies Europe Limited (ATEL)

Address of the manufacturer or supplier:
4 Doxford Drive
South West Industrial Estate
Peterlee
SR8 2RL
United Kingdom

Phone numbers of the manufacturer or supplier:
+44(0)1915872787

Transportation of finished battery packs.

These battery packs have passed the UN 38.3 manual of tests & criteria and are packaged in accordance with and declared as UN3480 PI 965 Section IB

The cells contained in this battery pack represent the only significant material safety risk for this product. See attached cell MSDS for further details.

SAFETY DATA SHEET

This Safety Data Sheet meets or exceeds the requirements of the Hazardous Products Regulation (HPR), the United States Occupational Safety and Health Administration (OSHA) hazard communication standard, the Australian National Occupational Health and Safety Commission (NOHSC), the Taiwan Bureau of Standards, Metrology & Inspection (BSMI), the Japan Ministry of Economy, Trade and Industry (METI), the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China(GB/T 16483-2008), Brazil standard ABNT NRB 14725-3, Malaysian Department of Environment and the European Union Commission Regulation (EC) No 1907/2006 and (EU) No 2015/830.

1. Identification of the Substance/Mixture and of the Company/Undertaking

1.1. Product Identifier

Name of the substance: Molicel Rechargeable Lithium-ion cells and multi-cell battery packs.

Product Codes:
IBR18650*, ICR14500*, ICR18650*, IMR18650*, INR18650*, INR20700*, INR21700*, IHR18650*, ICP103450*, ICP1003450*, IBR26700*, IMR26700*, MCR1821*, ME202*.
***Product codes can be followed by letters and/or numbers (A -ZZ, 0-9) which denote model designations. List of models can be found in section 16 of this SDS.**

Identification Number: Not applicable
Registration Number: Not applicable

Synonyms: Lithium-ion Cell, Lithium-ion Pack, Lithium-ion Battery, Li-Ion Cell, Li-Ion Pack, Li-Ion Battery. Synonyms may be preceded by the brand name Molicel and followed by the product code and model designation. For example: Molicel Lithium-ion Battery ME202C, Molicel Lithium-ion Cell ICR18650J.
Issue Date: 04-Jan-2021
Version number: AS
Revision Date: 01-Jan-2021
Supersedes Date: 28-Apr-2020

1.2. Relevant identified uses of the substance or mixture and uses advised against.

Identified uses: Rechargeable Lithium-ion cell for single cell or Multi-cell lithium-ion battery packs.
Restrictions on Use: For use as a battery-based power supply only. Do not rupture or expose solution inside of the cell or pack.

1.3. Details of the supplier of the safety data sheet.

Supplier Name: E-One Moli Energy (Canada) Ltd.	**Factory Name: E-One Moli Energy Corp. (Taiwan)**
Address: 20,000 Stewart Crescent Maple Ridge, B.C., Canada, V2X9E7	**Address: No.10 Dali 2nd Road, Tainan Science Park Shan-Hwa, Tainan County, 741, Taiwan**
E-Mail: molicel@molienergy.com	**E-Mail: service@molicel.com**
Telephone: (604) 466-6654	**Telephone: 886-6-5050666**

1.4. Emergency telephone number

24 hour emergency number within North America: CANUTEC 1-(613) 996-6666, collect calls accepted. (*666 on a cellular phone In Canada Only).
National Poison Control Telephone Numbers: See table 7 in Section 16 for a list by Country/State.

1.5 Details of the local distributor or agent of the products listed on the safety data sheet.

Distributor/Agent Name:
Address: **Telephone:**
Other Information: **Email:**
Local 24 Hour Emergency Telephone Number:

2. Hazards Identification

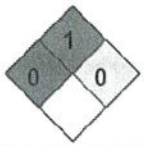
Protective Clothing	NFPA Rating (USA)	EC Classification	WHMIS (Canada)	SafeWork (Australia)
Not required with normal use.		Not classified as hazardous	Not applicable with normal use.	Not classified as hazardous
GHS Hazard Symbol	**IATA**	**JIS (Japan)**	**Taiwan**	**China**
Not applicable with normal use.		Not classified as hazardous	Not classified as hazardous	Not classified as hazardous
United States	**Brazil**	**Malaysia**		
Not classified as hazardous	Not classified as hazardous	Not classified as hazardous		

Table 1

2.1. Classification of the substance or mixture.

2.1.1. Preparation Hazards and Classification: The product is a Lithium ion cell or battery and is therefore classified as an article and is not hazardous when used according to the recommendations of the manufacturer. The hazard is associated with the contents of the cell or battery. Under recommended use conditions, the electrode materials and liquid electrolyte are non-reactive provided that the cell or battery integrity remains, and the seals remain intact. The potential for exposure should not exist unless the cell or battery leaks, is exposed to high temperatures or is mechanically, electrically or physically abused/damaged. If the cell or battery is compromised and starts to leak, based upon the battery ingredients, the contents are classified as Hazardous.

2.1.2. Classification according to Directive 67/548/EEC or 1999/45/EC as amended: Not applicable.

2.1.3. Classification according to Regulation (EC) No. 1272/2008 as amended: Not applicable.

2.1.4. Hazard Summary

Physical hazards: Not classified for physical hazards.
Health hazards: Not classified for health hazards.
Environmental hazards: Not classified for hazards to the environment.
Specific hazards: Exposure to contents of an open or damaged cell or battery: contact with this material will cause burns to the skin, eyes and mucous membranes.
May cause sensitization by skin contact.
Main Symptoms: Symptoms include itching, burning, redness and tearing.

2.2. Label elements

2.2.1. Label according to Regulation (EC) No. 1272/2008 as amended.

Identification Number: Not applicable.
Hazard pictograms: Not applicable.
Signal word: Not applicable.
Hazard statements: Not applicable under normal use in accordance with United Nations Conference on Environmental and Development (UNCED) and Occupational Safety and Health Administration (OSHA) 29 CFR 1910.1200. The article does not meet the criteria for classification.

Precautionary Statement(s) Prevention	P102: Keep out of reach of children. P103: Read label prior to use. P202: Do not handle until all safety precautions have been read and understood. P210: Keep away from heat/sparks/open flames/hot surfaces – No smoking. P234: Keep only in original container. P254: Wash hands thoroughly after handling.
Response (If cell/battery leaks)	P260: Do not breathe vapor or spray. P280: Wear protective gloves/protective clothing/eye protection/face protection. P301/330/331: IF SWALLOWED: Rinse mouth. DO NOT induce vomiting. P303/361/353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. P304/340: If INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. P305/351/338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P310: Immediately call a POISON CENTER or doctor/physician. P363: Wash contaminated clothing before reuse. P370: In case of fire: Use carbon dioxide, dry chemical or water extinguisher. P391: Collect spillage.
Health (if cell/battery leaks)	H314: Causes severe skin burns and eye damage. H315: Causes skin irritation. H317: May cause an allergic skin reaction. H319: Causes serious eye irritation. H335: May cause respiratory irritation. H400: Very toxic to aquatic life. H410: Very toxic to aquatic life with long lasting effects.
Storage (Store as indicated in Section 7)	P402: Store in a dry place. P405: Store locked up. P410: Protect from sunlight.
Disposal	P406: Store any spilled/leaking electrolyte material in a corrosive resistant container with a resistant inner liner. P501: Dispose of batteries in accordance with applicable hazardous waste regulations.

Table 2

Supplemental label information: None.

2.3. Other Hazards.

2.3.1. Appearance, Color and Odor: Solid object with no odor.

2.3.2. Primary Routes(s) of Exposure: These chemicals are contained in a sealed enclosure. Risk of exposure occurs only if the cell or pack is mechanically, thermally, electrically or physically abused to the point of compromising the enclosure. If this occurs, exposure to the electrolyte solution contained within can occur by inhalation, ingestion, eye contact and skin contact.

2.3.3. Potential Health Effect(s):

2.3.3.1. Acute (short term): see Section 8 for exposure controls.
If this cell or pack has been ruptured, the electrolyte solution contained within the cell would be corrosive and can cause burns to skin and eyes.
Inhalation: Inhalation of materials from a sealed cell is not an expected route of exposure. Vapors or mists from a ruptured cell may cause respiratory irritation.
Ingestion: Swallowing of materials from a sealed cell is not an expected route of exposure. Swallowing the contents of an open cell can cause serious chemical burns to mouth, esophagus, and gastrointestinal tract.
Skin: Contact between the cell and skin will not cause any harm. Skin contact with the contents of an open cell can cause severe irritation or burns to the skin.
Eye: Contact between the cell and the eye will not cause any harm. Eye contact with the contents of an open cell can cause severe irritation or burns to the eye.
2.3.3.2. CHRONIC (long term): see Section 11 for additional toxicological data.

2.3.4. Medical Conditions Aggravated by Exposure: Not Available.

2.3.5. Interactions with other chemicals: Immersion in high conductivity liquids may cause corrosion and breaching of the cell or battery enclosure. The electrolyte solution inside of the cells may react with alkaline (basic) materials and present a flammability hazard.

2.3.6. Potential Environmental Effects: Not Available.

3. Composition/information on ingredients

3.1. As a solid, manufactured article, exposure to hazardous ingredients is not expected with normal use.

Canada: This is not a controlled product under WHMIS. This product meets the definition of a "manufactured article" and is not subject to the regulations of the Hazardous Products Act.

USA: This cell or battery is an article pursuant to 29 CFR 1910.1200 and, as such, is not subject to the OSHA Hazard Communication Standard requirement. The information contained in this Safety Data Sheet contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

Australia: The product is a Lithium-ion cell or battery and is therefore classified as an article and is not hazardous when used according to the recommendations of the manufacturer. The hazard is associated with the contents of the cell or battery. If the cell or battery is compromised and starts to leak, based upon the battery ingredients, the contents are classified as Hazardous according to the criteria of the National Occupational Health and Safety Commission (SafeWork Australia).

EU: This product is an article according to the REACH Regulation (1907/2006) and (EC) No 2015/830.

Taiwan: This product is not classified as a dangerous good.

Japan: This product is not classified as a dangerous good.

China: This product is not classified as a dangerous good.

Brazil: This product is an article according to ABNT NRB 14725-2:2009.

Cell Component	Chemical Name	CAS No.	EINECS	*Concentration range in electrolyte (w/w %)	*Mass range in cell (g/g %)	GHS Classification
Electrolyte	Contains Electrolyte salt and solvents.				5-20	Skin Corr 1B – H314
Electrolyte salt	Lithium hexafluorophosphate	21324-40-3	244-334-7	5-30	1-5	-
Electrolyte solvents	Includes one or more of the following; Ethylene Carbonate Propylene Carbonate Diethyl Carbonate Dimethyl Carbonate Ethyl Methyl Carbonate	 96-49-1 108-32-7 105-58-8 616-38-6 623-53-0	 202-510-0 203-572-1 203-311-1 210-478-4 Not Listed	70-95	5-20	-
PVDF	Polyvinylidenfluoride	24937-79-9	Not Listed	-	<1	-
Copper	Cu	7440-50-8	231-159-6	-	9-18	-
Aluminium	Al	7429-90-5	231-072-3	-	17-27	-
Cathode	Includes one or more of the following; Lithium Cobaltite Manganese Nickel Aluminum	 12190-79-3 7439-96-5 7440-02-0 7429-90-5	 235-362-0 231-105-1 231-111-4 231-072-3	-	20-50	-
Anode	Includes one or more of the following; Graphite Carbon Black	 7782-42-5 1333-86-4	 231-955-3 215-609-9	-	13-18	-
Steel, Nickel, and inert components		Various	Various	-	Balance	-

Table 3

*Quantities may vary depending on cell or battery model.

4. First Aid Measures

4.1. Description of first aid measures

The hazardous components of this cell or battery are contained within a sealed unit. The following measures are only applicable if exposure has occurred to components when a cell or battery leaks, is exposed to high temperatures or is mechanically, electrically or physically abused/damaged. The hazardous contents are caustic alkaline electrolytes contained in cells with lithium metal oxide cathodes, graphite and carbon anodes and Polyvinylidenfluoride binders.

Ingestion:	Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Contact your local poison control center and quickly transport victim to an emergency care facility.
Eye Contact:	If eye contact with contents of an open cell occurs, immediately flush the contaminated eye(s) with water. Quickly transport victim to an emergency care facility.
Skin Contact:	Immediately flush with water. If irritation or pain persists, seek medical attention.
Inhalation:	Remove the patient from exposure into fresh air, seek medical attention.

PROTECTION FOR FIRST AIDERS: Do not enter corrosive vapor contaminated areas without a respirator or a Self-Contained Breathing Apparatus. Wear adequate personal protective equipment as indicated in Section 8.

FIRST AID FACILITIES: Eye wash bottle, fountain, safety showers or at least a source of running water are required in the area where the product is used.

4.2 MOST IMPORTANT SYMPTOMS & EFFECTS, ACUTE & DELAYED, CAUSED BY EXPOSURE:

ACUTE: The contents of the battery are rated as corrosive. Ingestion of the electrolyte could lead to severe gastrointestinal tract irritation with nausea, vomiting and potentially burns. Inhalation of vapors may lead to severe irritation of the mouth and upper respiratory tract with a burning sensation, pain, burns and inflammation in the nose and throat; there may also be coughing or difficulty breathing. Eye contact may lead to severe eye irritation or in worst case scenario irreversible damage and possible eye burns. Skin contact may lead to irritation and possible skin burns.

CHRONIC: Skin contact may aggravate/exacerbate existing skin conditions, such as dermatitis. Chronic inhalation may lead to the same symptoms as listed for acute inhalation above.

4.3 Indication of any immediate medical attention and special treatment needed

ADVICE TO DOCTOR: Treat symptomatically if the person comes into contact with the corrosive electrolyte liquid contents of a damaged battery.

5. Fire Fighting Measures

5.1 Extinguishing media

- 5.1.1 **Suitable extinguishing media:** Dry chemical, carbon dioxide and foam. Water acts as a cooling agent.
- 5.1.2 **Unsuitable extinguishing media:** Strong oxidizing agents, strong reducing agents, strong acids and strong alkalis. **Despite water incompatibility, water is the most effective firefighting tool to control the spread of fire to other cells and batteries and combustibles.**
- 5.1.3 **Explosion Data:** Closed containers may explode, burst, rupture or vent when exposed to temperatures above 120°C (248°F).
- 5.1.4 **Hazchem Code (**Australia, New Zealand, UK and Malaysia**): 4W**
- 5.1.5 **TDG/DOT ERG Code: 147**
- 5.1.6 **Sensitivity to Mechanical Impact:** Extreme mechanical abuse will result in rupture of the individual battery cells.
- 5.1.7 **Sensitivity to Static Discharge:** Electrostatic discharges imposed directly on the spilled electrolyte may start combustion.

5.2 Special hazards arising from the Chemical:

The interaction of water vapor and exposed lithium hexafluorophosphate (LiPF6) may result in the generation of hydrogen and hydrogen fluoride (HF) gas. Contact with battery electrolyte may be irritating to skin, eyes and mucous membranes. Thermal degradation may produce hazardous fumes of lithium, cobalt and manganese, hydrofluoric acid, hydrogen and oxides of carbon, aluminum, lithium, copper and cobalt as well and smoke and irritating, corrosive and/or toxic gases. Fumes may cause dizziness or suffocation.

5.3 Advice for firefighters:

In case of fire where lithium-ion cells and batteries are present, flood the area with water. If any cells or batteries are burning, water may not extinguish them, but will cool the adjacent cells or batteries and control the spread of fire. Carbon Dioxide, dry chemical and foam extinguishers may be preferred for small fires, but also may not extinguish burning lithium-ion cells or batteries.

Burning cells or batteries will burn themselves out. Virtually all fires involving lithium-ion cells and batteries can be controlled with water. When water is used, however, hydrogen gas may be evolved which can form an explosive mixture with air. LITH-X (powdered graphite) or copper powder fire extinguishers, sand, dry ground dolomite or soda ash may also be used. These materials act as smothering agents.

5.4 Protective Equipment and Precautions for firefighters:
In the case of a fire and the release of hydrogen fluoride, it is critical to protect the skin from any contact. Fire fighters should wear a self-contained breathing apparatus. Burning lithium-ion cells and batteries can produce toxic fumes including hydrogen fluoride (HF), oxides of carbon, aluminum, lithium, copper and cobalt. Volatile phosphorous penta fluoride may form at temperatures above 110°C (230°F). Wear adequate personal protective equipment as indicated in Section 8.

6. Accidental Release Measures

6.1. Personal precautions, protective equipment and emergency procedures:

6.1.1. For non-emergency personnel.

6.1.1.1. As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions. Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed areas before entering. Wear adequate personal protective equipment as indicated in Section 8.

6.1.2. For emergency responders

6.1.2.1. As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions. Keep unauthorized personnel away. Stay upwind and keep out of low areas. Ventilate closed areas before entering. Do not enter corrosive vapor contaminated areas without a respirator or Self-Contained (SCBA) Breathing Apparatus.
Suitable fabric for personal protective clothing: Chemical resistance gloves, safety glasses/goggles or face shield and chemical resistant clothing. Wear adequate personal protective equipment as indicated in Section 8.

6.2. Environmental precautions

6.2.1. Absorb spilled material with non-reactive absorbent such as vermiculite, clay or earth. Prevent from migration into soil, sewers and natural waterways – inform local authorities if this occurs.

6.3. Methods and material for containment and cleaning up

6.3.1. Evacuate spill area immediately and remove sources of ignition. Do NOT touch spilled material. Use non-sparking tools and equipment where applicable. Ensure that cleanup procedures do not expose spilled material to any moisture. Cover all drains and exits to the environment to prevent migration into the soil, sewers and natural waterways.

6.3.2. Cleanup personnel must be trained in the safe handling of this product. Spills may be absorbed by non-reactive absorbents such as vermiculite and then collected with an electrically protected vacuum cleaner or by wet-brushing and placing into a suitable container for disposal. Place cells or batteries into individual plastic bags and then place into appropriate containers and close tightly for disposal. Immediately transport closed containers outside. Lined steel drums are suitable for storage of damaged cells or batteries until proper disposal can be arranged. Ventilate area and wash spill site after material pickup is complete. Please consult local regulations on disposal of hazardous waste for complete details.

6.3.3. Never dispose of damaged cells or batteries in a fire.

6.4. Reference to other sections

6.4.1. For information on Hazards, see Section 2 of the SDS.
6.4.2. For information on personal protective equipment, see Section 8 of the SDS.
6.4.3. For information on physical and chemical properties, see Section 9 of the SDS.
6.4.4. For information on stability and reactivity, see Section 10 of the SDS.
6.4.5. For information on environmental effects, see Section 12 of the SDS.
6.4.6. For waste disposal, see section 13 of the SDS.

7. Handling and Storage

7.1. Precautions for safe handling

7.1.1. Do not short circuit, open, disassemble, crush, puncture or burn cells or batteries. Do not expose cells or batteries to extreme heat or fire. Do not solder cells. Do not mix cells of different types and brands. Do not mix new and used cells or batteries. Do not incinerate the cells or batteries as there is a danger of explosion. Do not use or charge damaged, defective or deformed cells or batteries.

7.1.2. Observe good industrial hygiene practices. Wash hands thoroughly after handling.

7.2. **Conditions for safe storage, including any incompatibilities**

7.2.1. **Conditions for safe storage:** Store in a cool, dry, well-ventilated area, out of direct sunlight and away from heat and ignition sources. To minimize any adverse effects on cell and/or battery performance, it is recommended that the cells and/or batteries be kept at room temperature (25°C +/- 5°C). Elevated temperatures can result in shortened cell and/or battery life. Keep out of reach of children. Store away from incompatible materials, see Section 10 of the SDS.

7.2.2. **Incompatibilities:** Water, strong oxidizing agents, strong reducing agents, strong acids and strong alkalis.

7.3. **Specific end use(s)**

7.3.1. Rechargeable Lithium-ion cell for single cell or Multi-cell lithium-ion battery packs. For use as a battery-based power supply.

7.4. **Links to other Sections**

7.4.1. For information on recommended uses, see Section 1 of this SDS.
7.4.2. For information on accidental release measures, see Section 6 of this SDS.
7.4.3. For information on personal protective equipment, see Section 8 of this SDS.
7.4.4. For information on physical and chemical properties, see Section 9 of this SDS.
7.4.5. For information on stability and reactivity, see Section 10 of this SDS.
7.4.6. For information on toxicological information, see Section 11 of this SDS.
7.4.7. For information on environmental effects, see Section 12 of this SDS.
7.4.8. For information on transport hazard classes, see Section 14 of this SDS.

8. Exposure Controls, Personal Protection

8.1. **Exposure Control Measures**

8.1.1. **Exposure Limit Values:** Airborne exposures to hazardous substances are not expected when the cells or batteries are used for their intended purposes. Exposure standards are not applicable to the sealed articles.
8.1.2. **Biological Monitoring:** Not applicable.
8.1.3. **Control Banding:** Not applicable.
8.1.4. **Recommended monitoring procedures:** Follow standard monitoring procedures.
8.1.5. **Derived no-effect level (DNEL):** Not applicable.
8.1.6. **Derived minimal effect level (DMEL):** Not applicable.
8.1.7. **Predicted no-effect concentrations (PNECs):** Not applicable.

8.2. **Engineering Controls**

8.2.1. **Engineering Controls:** Special ventilation is not required when using these products in normal use scenarios. Ventilation is required if there is leakage from the cell or battery.
8.2.2. **Individual Protection Measures**

8.2.2.1. **Eye and Face protection:** Eye protection is not required when handling cells or batteries during normal use. Wear chemical resistant safety glasses/goggles or face shield if handling a leaking or ruptured cell or battery.

8.2.2.2. **Skin (Hand) protection:** Hand protection is not required when handling the cell or battery during normal use. Chemical resistant gloves are recommended when dealing with a leaking or ruptured cell or battery.

8.2.2.3. **Skin (clothing) protection:** Skin protection is not required when handling the cell or battery during normal use. Wear long sleeved clothing to avoid skin contact if handling a leaking or ruptured cell or battery. Soiled clothing should be washed with detergent prior to re-use.

8.2.2.4. **Respiratory protection:** During routine operation, a respirator is not required. However, if dealing with an electrolyte leakage and irritating vapors are generated, an approved half face inorganic vapor and gas/acid/particulate respirator is required.

8.2.2.5. **Thermal Protection:** Not applicable.

8.2.2.6. **Other Protective Equipment:** Have a safety shower or eye wash station readily available

8.2.3. **Hygiene Measures:** Do not eat, drink or smoke in work areas. Avoid storing food, drink or tobacco near the product. Practice and maintain good housekeeping.

8.2.4. **Environmental exposure controls:** Avoid release to the environment.

Respiratory Protection	Hand Protection	Eye Protection	Other
			
In all fire situations, use self-contained breathing apparatus.	In the event of leaking or ruptured cells or batteries, wear gloves.	Safety glasses are recommended in case of leaking or ruptured cells or batteries.	In the event of leaking or ruptured cells or batteries, wear protective clothing.

Table 4

9. Physical and Chemical Properties

Physical State:	Solid, Sealed Unit*	**Vapor Pressure (mm Hg @ 20°C):**	Not Applicable*
Appearance:	Cell or Battery Pack	**Vapor Density:**	Not Applicable*
pH:	Not Applicable*	**Solubility in Water:**	Insoluble
Relative Density:	Not Applicable*	**Water/Oil distribution coefficient:**	Not Applicable*
Boiling Point:	Not Applicable*	**Odor Type:**	Odorless
Melting Point:	Not Applicable*	**Odor Threshold:**	Not Applicable*
Viscosity:	Not Applicable*	**Evaporation Rate:**	Not Applicable*
Oxidizing Properties:	Not Applicable*	**Auto Ignition Temperature (°C):**	Not Applicable*
Flash Point and Method (°C):	Not Applicable*	**Flammability Limits (%):**	Not Applicable*
Octanol/Water Partition Coefficient:	Not Applicable*	**Decomposition Temperature:**	90°C

Table 5

10. Stability and Reactivity

10.1. Stability and Reactivity

10.1.1. Reactivity: The cells or batteries do not pose any further reactivity hazards other than those listed in the following sub-sections.

10.1.2. Chemical Stability: The cells or batteries are stable under normal ambient and anticipated conditions of use, storage and transport.

10.1.3. Possibility of hazardous reactions: Keep away from water, strong oxidizing agents, strong reducing agents, strong acids and strong alkalis. Reaction of the leaking electrolyte materials with water may produce flammable and explosive hydrogen gas as well as corrosive hydrogen fluoride gas. Hazardous polymerization does not occur.

10.1.4. Conditions to avoid: Avoid exposing the cells or batteries to fire or temperatures above 80°C. Do not disassemble, crush, short circuit, puncture, immerse in liquid, burn, expose to flame or install with incorrect polarity. Avoid mechanical, physical or electrical abuse.

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

10.1.6. Hazardous decomposition products: May decompose to produce hydrogen fluoride, phosphorus oxides, sulfur oxides, sulfuric acid, lithium hydroxide, carbon monoxide and carbon dioxide.

10.2. Links to other Sections

10.2.1. For information on Hazards, see Section 2 of this SDS.

10.2.2. For information on fighting fires, see Section 5 of this SDS.

10.2.3. For information on accidental release, see Section 6 of this SDS.

10.2.4. For information on handling and storage, see Section 7 of this SDS.

10.2.5. For information on disposal, see Section 13 of this SDS.

11. Toxicological Information

11.1. Information on toxicological effects:
The hazardous components of the cell or battery are contained within a sealed unit. Under recommended use conditions, the electrode materials and liquid electrolyte are non-reactive provided that the cell or battery integrity remains, and the seals remain intact. The potential for exposure should not exist unless the battery leaks, is exposed to high temperature or is mechanically, electrically or physically abused/damaged. **The following toxicology data is in respect to if a person comes into contact with the electrolyte.**

11.2. Acute Toxicity:

11.2.1. Swallowed: The electrolyte contained within the cell or battery is a corrosive liquid. Ingestion of this electrolyte would be harmful. Swallowing may result in nausea, vomiting, diarrhea, abdominal pain and chemical burns to the gastrointestinal tract. During normal usage ingestion should not be a means of exposure.

11.2.2. Eye: The electrolyte contained within the cell or battery is a corrosive liquid and it is expected that it would cause irreversible damage to the eyes. Contact may cause corneal burns. Effects may be slow to heal after eye contact. Correct handling procedures incorporating appropriate eye protection should minimize the risk of eye irritation.

11.2.3. Skin: The electrolyte contained within the cell or battery is a corrosive liquid and it is expected that it would cause skin burns or severe irritation to the skin if not washed off immediately. Correct handling procedures should minimize the risk of skin irritation. People with pre-existing skin conditions, such as dermatitis, should take extreme care so as not to exacerbate the condition.

11.2.4. Inhaled: Inhalation of vapors from a leaking cell or battery is expected to cause severe irritation of the mouth and upper respiratory tract with a burning sensation, pain, burns and inflammation in the nose and throat; there may also be coughing or difficulty breathing.

11.3. Skin Corrosion/Irritation: The electrolyte contained within the cell or battery is classified as a corrosive liquid and is expected to exhibit Dermal Corrosivity/Irritation.

11.4. Serious Eye Damage/Irritation: The electrolyte contained within the cell or battery is classified as a corrosive liquid and is expected to exhibit serious Damage/Corrosivity.

11.5. Respiratory or Skin Sensitization: The electrolyte contained within the cell or battery is not expected to be a skin sensitizer according to OECD test 406, based on the available data and the known hazards of the components. The electrolyte contained within the cell or battery is not expected to be a respiratory tract sensitizer, based on the available data and the known hazards of the components.

11.6. Germ Cell Mutagenicity: The electrolyte contained within the cell or battery is not expected to be mutagenic according to test such as OECD tests 471, 475, 476, 478 and 479, based on the available data and the known hazards of the components.

11.7. Carcinogenicity: The electrolyte contained within the cell or battery is not expected to be a carcinogen. The cathode contains Cobalt and Nickel components. These components are classified as IARC 2B – possibly carcinogenic to humans, however they do not pose a threat when contained in the cell or battery sealed unit.

11.8. Reproductive Toxicity: The electrolyte contained within the cell or battery is not expected to be a reproductive hazard according to test such as OECD tests 414 and 421, based on the available data and the known hazards of the components.

11.9. Specific Target Organ Toxicity (STOT) – Single Exposure: The electrolyte contained within the cell or battery is corrosive and is expected to cause respiratory irritation by inhalation. Inhalation of vapors may lead to severe irritation of the mouth and upper respiratory tract with a burning sensation, pain, burns and inflammation in the nose and throat; there may also be coughing or difficulty breathing.

11.10. Specific Target Organ Toxicity (STOT) – Repeated Exposure: The cells or batteries are not expected to cause organ damage from prolonged or repeated exposure according to tests such as OECD tests 410 and 412, based on the available data and the known hazards of the components.

11.11. Aspiration Hazard: The cells or batteries are not classified as an aspiration hazard, based on the available data and the known hazards of the components. However, due to the corrosive nature of the product if swallowed, do NOT induce vomiting. If vomiting has occurred after ingestion the person should be observed to ensure that aspiration into the lungs has not occurred and assessed for chemical burns to the gastrointestinal and respiratory tracts.

11.12. Other Information: No additional data is available.

11.13. Links to other sections.

11.13.1. For information on hazards, see Section 2 of this SDS.
11.13.2. For information on first aid, see Section 4 of this SDS.
11.13.3. For information on accidental release, see Section 6 of this SDS.

11.13.4. For information on handling and storage, see Section 7 of this SDS.
11.13.5. For information on exposure controls and personal protection, see Section 8 of this SDS.
11.13.6. For information on the physical and chemical properties, see Section 9 of this SDS.
11.13.7. For information on disposal, see Section 13 of this SDS.
11.13.8. For information on transport hazard classes, see Section 14 of this SDS.
11.13.9. For information on regulatory, see Section 15 of this SDS.

12. Ecological Information

12.1. Ecotoxicity: The sealed cell or battery does not pose an Ecotoxicity hazard. Cells or batteries under normal use conditions pose no ecotoxicity hazard. In the case of a broken or damaged cell or battery and leakage of the electrolyte, it will react with water and potentially cause damage to flora and fauna if not disposed of properly. See Section 13 of this SDS for proper disposal considerations.
12.2. Persistence and degradability: There is currently no data available.
12.3. Bio accumulative potential: There is currently no data available.
12.3.1. Partition coefficient n-octanol/water (log Kow): Not applicable.
12.3.2. Bio concentration factor (BCF): Not available.
12.4. Mobility in soil: There is currently no data available.
12.5. Results of PBT and vPvB assessment: Not a PBT or vPvB substance or mixture.
12.6. Other adverse effects: Solid cells and batteries released into the natural environment will slowly degrade and may release harmful or toxic substances. Cells and batteries are not intended to be released into water or on land but should be disposed or recycled according to local regulations. See section 13 of this SDS for Disposal Considerations.
12.7. Links to other Sections.
12.7.1. For information on accidental release, see Section 6 of this SDS.
12.7.2. For information on disposal, see Section 13 of this SDS.
12.7.3. For information on transport hazard classes, see Section 14 of this SDS.

13. Disposal Considerations

13.1. **Waste treatment methods:** Cell and battery recycling is encouraged. Cells and batteries should not be released into the environment, do **NOT** dump into any sewers, on the ground or into any body of water. Do not dispose of in fire. Used cells and batteries should be stored in their original packaging, a plastic bag or with their terminals/contacts taped to minimize the potential for short-circuiting to occur. Cells and batteries should be fully discharged before being sent for recycling. Do not store used cells or batteries near heat sources, chemicals or food. Do not store or transport used lithium-ion cells or batteries with lead acid batteries as they have different regulatory requirements. Do not break open or damage lithium-ion cells or batteries prior to disposal. Care should always be taken to ensure that used cells or batteries are not damaged during storage or transport. Store material for disposal as indicated in Section 7 Handling and Storage.

13.2. Classification of the waste to comply with Waste Regulations.

13.2.1. Canada: Spent cells and batteries are not considered hazardous waste. Cells and batteries involved in a fire may be hazardous waste. Dispose of in accordance with local, provincial and federal laws and regulations. Consult the Canadian Environmental Protection Act for additional details. BC, MN, ON and QC have regulated the collection of waste batteries, contact your provincial and local government for more details.

13.2.2. USA: Spent cells and batteries are not considered hazardous waste. Cells and batteries involved in a fire may be hazardous waste. 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 cell or battery is leaking/broken open, consult hazardous waste regulations under US EPA Resource Conservation and Recovery Act (RCRA), waste code: D003 (reactivity).
CA, UT, WY, ND, SD, NM, TX MN, IA, WI, AR, LA, MS, IN, KY, WV, VA, NC, SC, FL, PR, PA NY, ME VT, NJ, NH, CT and MD have state battery recycling requirements in effect. CA, FL, IA, MD, ME, MN, NJ, NY and VT require battery producers to offer or fund battery recycling. Consult state and local regulations for further disposal requirements.

13.2.3. Australia: Spent cells and batteries must be taken for recycling or disposal at an appropriate collection depot by suitably licensed contractors in accordance with local council or government regulations.
13.2.3.1. Which Bin hotline:1300 137 118.

13.2.4. 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. See Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators.
13.2.4.1. EU Waste Code: 16 06 05 – other batteries and accumulators.

13.2.5. **Taiwan:** Cells and batteries are not considered hazardous waste. Cells and batteries should be recycled at an appropriate collection site in accordance with government regulations.

13.2.6. **Japan:** Recycling of spent lithium-ion cells and batteries is regulated by the Wastes Disposal and Public Cleaning Law and the Law for Promotion of Effective Utilization of Resources, cells and batteries should be recycled at a JBRC (Japan Battery Recycling Center) approved facility.

13.2.7. **Brazil:** Lithium-ion cells and batteries should be recycled according to the National Solid Waste Policy (PNRS) of CONAMA in compliance with the directives and regulations of the National System for Environment (SISNAMA).

13.2.8. **Malaysia:** Lithium-ion cells and batteries are considered scheduled wastes and must be sent to a proper collection, treatment, recycling and disposal center.

13.2.8.1. **Scheduled Waste Code: SW103**

13.3. **Classification of the waste to comply with Transport Regulations:** Spent lithium-ion cells and batteries are not considered hazardous waste. Lithium-ion cells and batteries involved in a fire may be hazardous waste and should be classified as such. Damaged lithium-ion cells and batteries are explicitly prohibited from transport by air.

13.4. **Classification of Packaging materials:** Unsoiled excess packaging should be disposed of according to any applicable recycling regulations and is not considered hazardous waste. Soiled packaging or packaging exposed to the interior of a lithium-ion cell or battery pack should be considered hazardous waste and disposed of according to local hazardous waste rules and regulations.

14. Transport Information

Lithium-ion cells and batteries are regulated for land, sea and air transportation. It is recommended that Lithium-ion cells and batteries should not be fitted to equipment during transportation. **Note:** Cells and Batteries must always be protected against short-circuiting during transport. Special precautions should be undertaken when damaged or defective cells and batteries are transported. You must contact the manufacturer before transporting damaged or defective cells and batteries. It is prohibited to carry defective or damaged cells and batteries by air.
E-One Moli Energy cells and batteries are designed to comply with all applicable shipping regulations as prescribed by industry and legal standards which include compliance with the UN Recommendations on the Transport of Dangerous Goods, IATA Dangerous Goods Regulations, U.S. DOT regulations for the safe transport of lithium-ion batteries, the International Maritime Dangerous Goods Code and the Canadian Transport of Dangerous Goods regulations.

14.1. **UN Number:** **UN3480** or **UN3481**

14.2. **UN Proper Shipping Name:**
UN3480 – Lithium Ion Batteries.
UN3481 – Lithium Ion Batteries Contained in Equipment
UN3481 – Lithium Ion Batteries Packed with Equipment

14.3. **Transport Hazard Class(es):**

Class:	9
Subsidiary Risk:	-
Label(s):	Class 9 Lithium Label, Lithium Handling Label, Cargo Aircraft Only







Hazard No. (ADR):	9
Tunnel Restriction code:	E

14.4. **Packing Group:** See Regulations.

14.5. **Environmental hazards:**
Marine Pollutant: No

14.6. **Special Precautions for user:** Read safety instructions, SDS and emergency procedures before handling.

14.6.1. **Hazchem Code:**	**4W**
14.6.2. **TDG/DOT ERG Code:**	**147**
14.6.3. **ICAO/IATA ERG Code:**	**12FZ**

14.7. **Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:** Not Applicable

14.8. Modal Information

14.8.1. Land (ADR): UN3480 – P903, P908, P909, P910, P911, LP903, LP904, LP905 and LP906.
(Special Provision 188, 230, 310, 348, 376, 377 and 636 may apply.)
UN3481 – P903, P908, P909, P910, P911, LP903, LP904, LP905 and LP906.
(Special Provision 188, 230, 310, 348, 360, 376, 377 and 636 may apply.)

14.8.2. Land (RID): UN3480 – P903, P908, P909, P910, LP903 or LP904
(Special Provision 188, 230, 310, 348, 376, 377 and 636 may apply.)
UN3481 – P903, P908, P909, LP903 or LP904
(Special Provision 188, 230, 348, 360, 376, 377 and 636 may apply.)

14.8.3. Land (ADN): UN3480 – P903, P908, P909, P910, LP903 or LP904
(Special Provision 188, 230, 310, 348, 376, 377, 387 and 636 may apply.)
UN3481 – P903, P908, P909, P910, LP903 or LP904
(Special Provision 188, 230, 310, 348, 360, 376, 377 and 636 may apply.)

14.8.4. Land (TDG): UN3480 – Special Provision 34, 123, 137, 138 and 159 may apply.
UN3481 – Special Provision 34, 123, 137, 138 and 159 may apply.

14.8.5. Sea (IMDG): UN3480 and UN3481 - P903, P908 or P910
(Special provision 188, 230, 310, 348, 376, 377 and 384 may apply.)
EmS: F-A, S-I; Stowage Category A, Stowage code: SW19
IMDG Code: 9033

14.8.6. Air (IATA): UN3480/UN3481 – PI965, PI966 and PI967
(Special Provision A48, A88, A99, A154, A164, A183, A201, A206, A213, A331, A334 and A802 may apply).
ERG Code: 12FZ
Lithium ion cell or batteries - Lithium ion batteries in compliance with Packing Instruction 965.
Lithium ion cell or batteries packed with equipment - Lithium ion batteries in compliance with Packing Instruction 966.
Lithium ion cell or batteries contained in equipment - Lithium ion batteries in compliance with Packing Instruction 967.

Molicel products listed under this SDS will conform to various sections of the packing instructions based on the contents, packaging and mode of the shipment. Please see the shipping documents for complete details for individual shipments. This document is not intended to replace or authorize shipments of lithium-ion cells; it is intended as a guide for use by trained individuals.

15. Regulatory Information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture:

15.1.1. International Information

15.1.1.1. Montreal Protocol (Ozone depleting substances): Not applicable

15.1.1.2. The Stockholm Convention (Persistent Organic Pollutants): Not applicable

15.1.1.3. The Rotterdam Convention (Prior informed consent): Not applicable

15.1.1.4. The Basel Convention (Hazardous Waste): Not applicable

15.1.1.5. The MARPOL Convention (Prevention of pollution from Ships): Not applicable

15.1.1.6. UN Transportation of Dangerous Goods: All cells and batteries have passed the applicable testing.

15.1.2. Canadian Federal, Provincial and Territorial Regulations:
These products have been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.

WHMIS Classification: Not Controlled, manufactured article.

New Substance Notification Regulations: Lithium hexafluorophosphate and Ethyl Methyl Carbonate are listed on the Non-Domestic Substance List (NDSL). All other ingredients in the product are listed, as required, on Canada's Domestic Substances List (DSL).

National Pollutant Release Inventory (NPRI) and Ontario Regulation 127/01 Substances:
Copper, CAS#7440-50-8, 9-18% w/w
Manganese, CAS#7439-96-5, 20-50% w/w
Nickel, CAS#7440-02-0, 20-50% w/w

British Columbia, Manitoba, Ontario and Quebec require all manufacturers of consumer batteries to participate in a stewardship plan to provide free collection and recycling of consumer batteries that they produce. Recycling is encouraged in all Provinces and Territories.

15.1.3. United States Federal and State Regulations:
TSCA Status: All ingredients in these products are listed on the TSCA inventory.

OSHA: These products do not meet criteria as per Part 1910.1200, manufactured article.

SARA EPA Title III: None.

Sec. 302/304: None.
Sec. 311/312: None.
Sec. 313: Supplier Notification: This Product Contains a toxic chemical or chemicals subject to the reporting requirements of section 313 of (Title) III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. Supplier notification requirement does not apply to batteries that are considered consumer products.

Chemical	CAS	% by weight
Aluminium	7429-90-5	17-27
Copper	7440-50-8	9-18
Graphite	7782-42-5	13-18
Lithium Cobaltite	12190-79-3	20-50
Lithium-Hexafluorophosphate	21324-40-3	1-5

CERCLA RQ : Lithium Cobaltite (CAS 12190-79-3), Copper (CAS 7440-50-8), Nickel (CAS 7440-02-0).
US EPA Waste Code: D003 (reactivity) – damaged and leaking cell or battery only.
State of California: Rechargeable Battery Recycling Act – Division 30, Part 3, Chapter 8.4 of the Public Resource Code. Consumers must recycle all single use batteries or take them to a household hazardous waste disposal facility, a universal waste hander or an authorized recycling facility.
California Proposition 65-Safe Drinking water and toxic enforcement act.
E-One Moli Energy products and packaging may contain chemicals known to the state of California to cause cancer or birth defects or other reproductive harm. E-One Moli Energy has chosen to provide a warning based on its knowledge about the possible presence of one or more listed chemicals without attempting to evaluate the exposure. With E-One Moli Energy products, the exposure may be negligible or well within the "no significant risk" range, however, out of an abundance of caution, E-One Moli Energy has elected to provide a proposition 65 warning for California residents.
State of Minnesota: Rechargeable Battery and Products Law – Rechargeable batteries and products with non-removable batteries cannot be disposed as mixed municipal waste.
State of New York: Rechargeable Battery Law – It is illegal to dispose of rechargeable batteries in the state of New York as solid waste.

15.1.4. Australia and New Zealand
SUSMP: Not applicable
AICS: All ingredients are on the AICS list.
HSNO Approval number: Not applicable
HSNO Group Title: Not applicable
NOHSC:1008 Risk Phrases: R34 - Causes Burns.
NOHSC:1008 Safety Phrases:
S1 – Keep locked up.
S2 – Keep out of reach of children.
S23 – Do not breathe vapor.
S24/25 – Avoid contact with skin and eyes.
S26 – In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S27/28 – After contact with skin, take off immediately all contaminated clothing and wash immediately with plenty of water.
S36/37/39 – Wear suitable protective clothing, gloves and eye/face protection.
S56 – Dispose of this material and its container at hazardous waste or special waste collection point.
S62 – If swallowed, DO NOT induce vomiting: seek medical advice immediately and show this container or label.
S64 – If swallowed, rinse mouth with water (Only if the person is conscious).
AS/NZS 5139: Not Applicable

15.1.5. EC Classification for the Substance/Preparation:
These products are not classified as hazardous according to Regulation (EC) No. 1272/2008.
Keep out of the reach of children.

15.1.5.1. EU Regulations:
Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I: Not listed.
Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex II: Not listed.
Regulation (EC) No. 850/2004 on persistent organic pollutants, Annex I as amended: Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 1 as amended: Not listed.
Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 2 as amended: Not listed.
Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 3 as amended: Not listed.
Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex V as amended: Not listed.
Regulation (EC) No. 166/2006, REACH Article 59(10) Candidate List as currently published by ECHA: Not listed.

15.1.5.2. EU Authorizations:
Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorization, as amended: Not listed.

15.1.5.3. EU Restrictions on use:
Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended: Aluminium (CAS 7429-90-5)
Directive 2004/37/EC: on the safety and health of pregnant workers and workers who have recently given birth or are breastfeeding: Not listed.

15.1.5.4. Other EU Regulations
Directive 96/82/EC (Seveso II) on the control of major accident hazards involving dangerous substances: Not listed.
Directive 94/33/EC on the protection of young people at work: Not listed.
This Safety Data Sheet complies with the requirements of Regulation (EC) No. 1907/2006 and amended on 28 May 2015 by (EU) 2015/830.

15.1.6. Japanese Regulations
Japanese Industrial Standards (JIS) JIS Z 7253:2012
Waste disposal and public cleaning law
Law for Promotion of Effective Utilization of Resources

15.1.7. Taiwanese Regulations
Regulation of Labelling and Hazard Communication of Dangerous and Harmful Materials: Labeling requirements and other relevant provision of chemicals, this product is not classified as dangerous goods.
Toxic Chemicals Substance Control Law: Not Listed.
CNS 1030016 Safety of primary and secondary lithium cells and batteries during transport.

15.1.8. Chinese Regulations
General Rule for Classification and Hazard Communication of Chemicals (GB 13690-2009): Specifies the classification, labeling and hazard communication of chemicals in compliance with the GHS standard for chemical production sites and labeling of consumer goods.
General Rule for Preparation of Precautionary Labels for Chemicals (GB 15258-2009): Specifies the relevant application methods of precautionary labels for chemicals.
Safety Data Sheet for Chemical Products Content and Order of Sections (GB/T 16483-2008)

15.1.9. Brazil Regulations
National Solid Waste Policy (PNRS) of CONAMA in compliance with the directives and regulations of the National System for the Environment (SISNAMA).

15.1.10. Malaysian Regulations
Guidelines for the Classification of used Electrical and Electronic Equipment in Malaysia, 2nd Edition, 2010
Environmental Quality Regulation, 2005.
Scheduled Waste code SW103: Waste of batteries containing cadmium and nickel or mercury or lithium.

15.1.11. Other Regulations
None Listed.

15.2. Chemical Safety Assessment: Not applicable.

16. Other Information

Preparation Date: April 28th, 2020.
Prepared by: E-One Moli Energy (Canada) Limited. 20,000 Stewart Crescent, Maple Ridge, British Columbia, Canada V2X 9E7.

Revisions:

AA: (October 2014) First Release
AB: (January 2015) Document wide: Minor corrections to formatting and tab spacing. Section 1.3, added factory address. Section 1.4, indicated collect number to call. Section 2.0, Table 1 – added IATA, Taiwan, Japan and China entries. Section 3.1, added Taiwan, Japan and China entries. Section 13.2, added Taiwan and Japan disposal information subsections. Section 13.4, added classification of packaging materials. Section 15, added Japanese, Taiwanese and Chinese regulatory information. Section 16, updated Acronyms, added Japanese, Taiwanese and Chinese references to the disclaimer.
AC: (March 2015) Section 14.9.5 , added the transport by air detail information.
AD: (May 2015) Section 3.1, Table 3, spelling and CAS number correction.
AE: (May 2015) Section 16, added cell and pack capacity table to include watt hour rating and ELC.
AF: (June 2015) Updated sections 6, 7, 8, 10 and 15 to comply with current EU regulation EU2015/830 of 28 May 2015.
AG: (August 2015) Clarified 14.8.5 IATA Shipping regulations, removed explicit language on compliance to sections of packing instructions as that would be determined by the contents of the packages prepared by a trained shipper at the time of shipment and cannot be known at the time of this writing. Added ICR18650P to table in Section 16, Cell and pack capacities and watt hour ratings.
AH: (November 2015) Section 1.4 Updated Emergency contact number to include link to national poison control centers Section 4.1 added "contact your local poison control center" under ingestion hazard. Section 14.8 Updated and clarified Modal information for land, sea and air transport. Section 16 added table 7 detailing national poison control center contact information.
AI: (January 2016) Section 3.1 added Brazil requirements. Section 13.2 added Brazil recycling requirements. Section 15.1.9 added Brazil requirements. Section 16 Updated table 7 detailing national poison control center contact information.
AJ: (November 2016) Section 1.1 updated to include INR20700* cell. Section 2 updated table 1 and table 2. Added Section 5.1.5 TDG/DOT ERG Code Section 13.2.8 added Malaysian waste regulations. Section 14.3 added label pictures as examples. Added Section 14.6.2-3 ICAO/IATA, TDG/DOT ERG Codes. Section 14.8.5 added special provision A206 Section 15.1.2 updated Canadian regulations to include provincial requirements. Section 15.1.3 updated United States regulations. Section 15.1.10 added Malaysian regulations. Section 16 updated Table 6 to include INR20700A cell. Section 16 updated Table 6 to include weights in grams of each product. Section 16 Updated Table 7, National Emergency Poison Control Telephone number list Section 16 Updated literature and sources of data.
AK: (June 2017) Document wide: minor corrections to formatting and spelling. Section 13.2.1 updated Canadian disposal regulations. Section 13.2.2 updated United States disposal regulations. Section 13.2.4 updated European Union disposal regulations. Section 14.8.4 updated Modal information. Section 15.1.2 updated Canadian Regulations. Section 15.1.3 added US EPA Waste Code. Updated State Laws. Section 15.1.4 updated Australian and New Zealand regulations. Section 16 updated acronyms and literature references. **Revisions Continued on Next Page.**

Continued from Last Page AL: (January 2018) Section 14.8.1 updated modal information for Land (ADR) Section 14.8.2 updated modal information for Land (RID) Section 14.8.3 updated modal information for Land (ADN) Section 14.8.4 updated modal information to include Land (TDG). Section 14.8.6 updated modal information for AIR (IATA) Section 16, table 6, added 4 cell models. Section 16 updated acronyms and literature references.
AM: (February 2018) Section 1.4 updated CANUTEC emergency number. Section 11.5 updated to include cell or battery in definition. Section 14.3 updated lithium handling label. Section 15.1.3 Updated US Federal Regulations. Added California Proposition 65 Warning statement.
AN: (April 2018) Section 1.1 updated product codes Section 16, table 6, added 2 cell models.
AO: (December 2018) Section 14.6.3 IATA/ICAO ERG code updated. Section 14.8.5 updated IMDG Modal information. Section 16, table 6, added 2 cell models.
AP: (April 2019) Section 14.3 Updated lithium handling label. Section 14.8 updated Modal information.
AQ:(September 2019) Section 14.8.6 amended IATA modal information. Section 16, table 6, added 1 cell model.
AR: (December 2019) Document wide: minor corrections to spelling and grammar. Section 1.5 added a field for the addition of a local 24-hour emergency number outside of North America. Section 13.2.2 US waste regulations updated. Section 13.2.3 Australian waste regulations updated. Section 16, update of literature references.
AS: (April 2020) Section 16, Table 6 added minimum capacity values for 2 cell models.
AT: (Jan 2021) Section 16, Table 6 added cell models Section 16, update of literature references.

E-One Moli Energy

Cell and pack capacities and watt hour ratings:

Model Number	Nominal Voltage (V)	Typical Capacity (Ah)	Watt Hour Rating (Wh) (Volts x Ah)	Equivalent Lithium Content (g) (cell Ah x 0.3 x #cells)	Weight (grams)
IBR18650B/BB/BC	3.60 V	1.50 Ah (1.4Ah Min)	5.40 Wh	0.45 g	45.0 g
IBR26700A	3.75 V	2.80 Ah	10.50 Wh	0.84 g	101.0 g
ICP1003450B	3.70 V	1.80 Ah	6.66 Wh	0.54 g	46.5 g
ICP103450CA	3.70 V	1.96 Ah	7.25 Wh	0.59 g	41.5 g
ICP103450DA	3.70 V	2.20 Ah	8.14 Wh	0.66 g	43.0 g
ICP103450M20A	3.70 V	2.00 Ah	7.40 Wh	0.60 g	42.0 g
ICR14500A	3.70 V	1.15 Ah	4.25 Wh	0.34 g	23.5 g
ICR18650H	3.70 V	2.20 Ah	8.14 Wh	0.66 g	47.5 g
ICR18650J	3.70 V	2.37 Ah	8.77 Wh	0.71 g	48.0 g
ICR18650K	3.70 V	2.60 Ah	9.62 Wh	0.78 g	50.0 g
ICR18650M	3.70 V	2.80 Ah	10.36 Wh	0.84 g	50.0 g
ICR18650P	3.70 V	3.20 Ah	11.84 Wh	0.96 g	50.0 g
IHR18650B	3.60 V	2.25 Ah	8.10 Wh	0.68 g	47.5 g
IHR18650BL	3.50 V	2.00 Ah	7.00 Wh	0.60 g	47.0 g
IHR18650BN	3.60 V	2.20 Ah	7.92 Wh	0.66 g	45.0 g
IHR18650C	3.60 V	2.05 Ah (2.0Ah Min)	7.38 Wh	0.62 g	47.0 g
IMR18650E	3.80 V	1.40 Ah	5.32 Wh	0.42 g	42.0 g
IMR26700A	3.80 V	2.90 Ah	11.02 Wh	0.87 g	101.0 g
INR18650A	3.60 V	2.55 Ah	9.18 Wh	0.77 g	47.0 g
INR18650-P26A	3.60 V	2.60 Ah	9.36 Wh	0.78 g	50.0 g
INR18650-P28A	3.60 V	2.80 Ah	10.08 Wh	0.84 g	48.0 g
INR18650-P28B	3.65 V	2.70 Ah	9.85 Wh	0.81 g	45.6 g
INR18650-M30A	3.60 V	3.00 Ah	10.80 Wh	0.90 g	47.0 g
INR18650-M35A	3.60 V	3.45 Ah	12.42 Wh	1.04 g	50.0 g
INR20700A	3.60 V	3.00 Ah	10.80 Wh	0.90 g	60.0 g
INR20700-M42A	3.60 V	4.20 Ah	15.12 Wh	1.26 g	64.0 g
INR21700-P42A	3.60 V	4.20 Ah	15.12 Wh	1.26 g	67.0 g
INR21700-P42B	3.70 V	4.10 Ah	15.17 Wh	1.23 g	66.5 g
INR21700-M50A	3.60 V	5.00 Ah	18.00 Wh	1.50 g	68.0 g
MCR1821J	7.40 V	2.40 Ah	17.76 Wh	1.44 g (2 cells)	107.0 g
ME202CJ	11.10 V	7.20 Ah	79.92 Wh	6.48 g (9 cells)	520.0 g
ME202EK	11.10 V	7.80 Ah	86.58 Wh	7.02 g (9 cells)	520.0 g

Table 6

National Emergency Poison Control Telephone number list
(The below table is a guide only and provided for reference, please consult your local government for updated information)

Country/State	National Poison Control Telephone Number	Country/State	National Poison Control Telephone Number
Algeria	+213 21 97 98 98	Italy – Milano	+39 02 6610 1029
Angola	+244 912 225 301	Italy – Turin	+39 011 663 7637
Argentina	+54 11 156 216 75 74	Jamaica	+1 888 764 7667
Australia	131126	Japan	0425 52 2511 ext 57740
Austria	+43 1 406 43 43	Jordan	109
Azerbaijan	+994 125 979 924	Kazakhstan	+7 3272 925 868
Belarus	+375 17 287 00 92	Kenya	0 800 720021
Belgium	+32 70 245 245	Latvia	+371 67042473
Brazil	None (Call 192 for Medical Emergency)	Lebanon	+961 3 174774
Bulgaria	+359 2 9154 378	Liechtenstein	112
Cambodia	+85 511 426 948	Lithuania	+370 5 236 20 52 / +370 687 53378
Canada – Alberta	1-800-332-1414	Luxembourg	070 245 245
Canada – British Columbia	1-800-567-8911	Macedonia	+38 923 147 635
		Malaysia	1 800 88 80 99
Canada – Manitoba	1-855-776-4766	Malta	112
Canada – New Brunswick	911	Mexico	066
Canada – Newfoundland and Labrador	1-866-727-1110	Mongolia	+976 992 755 95
Canada – Northwest Territories	1-800-332-1414	Morocco	+212 537 68 64 64
Canada – Nova Scotia	1-800-565-8161	Myanmar	+95 1 379 480

Canada – Nunavut	1-800-268-9017	Nepal	+97 71 435 38 77
Country/State	National Poison Control Telephone Number	Country/State	National Poison Control Telephone Number
Canada – Ontario	1-800-268-9017	Netherlands	+31 30 274 88 88
Canada – Prince Edward Island	1-800-565-8161	New Zealand	+0800 764 766
Canada – Quebec	1-800-463-5060	Nicaragua	+505 228 97 150
Canada - Saskatchewan	1-866-454-1212	Norway	+47 22 59 13 00
Canada – Yukon Territory	(867) 393-8700	Oman	+968 245 665 10
Chile	+56 2 635 3800	Pakistan	0800-77767
China	+86 10 831 323 45	Paraguay	+595 21 220 418
Costa Rica	+506 2223 1028 / 911	Peru	+511 273 2318
Cuba	+53 64 10 00	Philippines	+632 524 10 78
Cyprus	1401	Poland	+48 42 63 14 724
Czech Republic	+420 22 49 192 93	Portugal	808 250 143
Denmark	82 12 12 12	Puerto Rico	+1 800 222 1222
Ecuador	1 800 836 366	Romania	+402 212 106 282
Egypt	+20 2 684 09 02	Russia – Moscow	+7 495-628-1687
Estonia	16662	Russia – St Petersburg	+7 921-757-3228
Finland	+358 9 471977	Saudi Arabia	+966 11 288 9999 ext 29590
France	0800 59 59 59	Senegal	+221 818 00 15 15
Georgia	+995 99 53 33 20	Serbia	+381 11 3608 440
Germany	19 240	Slovakia	+421 2 5477 4166
Germany – Baden-Wurttemberg	0761-19 240	Slovenia	+386 41 635 500
Germany – Bavaria	089-19 240	South Africa	+27 824 910 160
Germany – Berlin, Brandenburg	030-19 240	South Korea	129
Germany – Bremen, Hamburt Schleswig-Holstein, Niedersachsen	0551-19 240	Spain	+34 91 562 04 20
Germany – Hessen, Rhineland-Pfalz	06131-19 240	Sri Lanka	+94 11 268 61 43
Germany – Mecklenburg-Vorpommern, Sachsen, Sachsen Anhalt, Thüringen	0361-19 240	Sweden	112
Germany – Nordrhein-Westfalen	0228-19 240	Switzerland	145
Germany – Saarland	06841-19 240	Syria	+963 11 4452 155
Ghana	+233 (0) 800 100 46	Thailand	1367
Greece	210 7793777	Trinidad and Tobago	+1 868 800 2742
Guatemala	1-801-0029832	Tunisia	+216 1 335 500
Hong Kong	+852 2772 2211	Turkey	+90 0312 433 70 01
Hungary	(+36-80) 201-199	Taiwan	119
Iceland	+354 543 22 22	United Arab Emirates	800 424
India	+91 112 658 93 91	United Kingdom	111
Indonesia	+62 813 1082 6879	United Republic of Tanzania	+255 (0)683 159110
Iran	1490	Uruguay	1722
Iraq	+964 (0)780 191 3821	United States	1-800-222-1222
Ireland	+353 1 809 2166	Venezuela	+58 16 621 808
Israel	+972 4 854 19 00	Viet Nam	+84 (0)4 8697 501
Italy	+39 38 224 444	West Bank and Gaza Strip	1800 500 000
Italy – Bergamo	+39 800 883 300	Zimbabwe	+263 4 307 148

Table 7

Acronyms:

SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
CAS Number	Chemical Abstracts Service Registry Number
EINECS	European Inventory of Existing Commercial Chemical Substances
UN Number	United Nations Number
OSHA	Occupational Safety and Health Administration
ACGIH	American Conference of Governmental Industrial Hygienists
IMDG	International Maritime Dangerous Goods
IATA	International Air Transport Association
IUCLID	International Uniform Chemical Information Database
RTECS	Registry of Toxic Effects of Chemical Substances
R-Phrase	Risk Phrases
S-Phrase	Safety Phrases

%W/W	Percent weight for weight
OECD	Organization for Economic Co-Operation and Development
ADG Code	Australian Code for the Transport of Dangerous Goods by Road and Rail
HAZCHEM Code	Emergency action code of numbers & letters which gives information to emergency services
NOHSC	National Occupational Health and Safety Commission
AICS	Australian Inventory of Chemical Substances
TWA	Time-Weighted Average
STEL	Short term Exposure Limit
HSNO	Hazardous Substances and New Organisms Act 1996
GHS	Globally Harmonized System of Classification and Labelling of Chemicals
METI	Japanese Ministry of Economy, Trade and Industry
BSMI	Taiwan Bureau of Metrology and Inspection
JIS	Japanese Industrial Standard
ERG	Emergency Response Guide
EPA	Environmental Protection Agency – USA.
DSL	Environment Canada Domestic Substances List
NDSL	Environment Canada Non Domestic Substances List
TDG	Transport of Dangerous Goods Regulations

Literature References and Sources of Data:

OECD Guidelines for Testing of Chemicals, Annex I: OECD Test Guidelines for Studies Included in SIDS.
Manual for the Assessment of Chemicals, Chapter 2 Data Gathering
International Toxicity Testing Guidelines
Hazardous Substance Information System - Guidance Material for Hazard Classifications
Preparation of Safety Data Sheets for Hazardous Chemicals Code of Practice.
Model Work Health and Safety Regulations - Transitional Principles
Workplace Exposure Standards for Airborne Contaminants
Australian Dangerous Goods Code 7th Edition
Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008 (2004)]
Guidance on the Classification of Hazardous Chemicals under the WHS Regulations
Assigning a Hazardous Substance to a Group Standard
User Guide to the HSNO Thresholds and Classifications
Summary User Guide to the HSNO Thresholds and Classifications of Hazardous Substances
Correlation between GHS and New Zealand HSNO Hazard Classes and Categories, HSNO Control Regulations
Record of Group Standard Assignment
Labelling of Hazardous Substances Hazard and Precautionary Information
Thresholds and Classifications under the Hazardous Substances and New Organisms Act 1996
Workplace Exposure Standards and Biological Exposure Indices
Handheld Battery Recycling - Guidelines for Lithium Batteries (Australian Battery Recycling Initiative) and Guidelines for Transport.
European Waste Catalog and Hazardous Waste List
IATA Dangerous Goods Regulations, 62nd Edition, includes amendments.
European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR) 2017
Transport of Dangerous Goods Regulations (International Harmonization Update, 2016) SOR/2017-137
IMO IMDG Code, Volume 1 and 2, 2016 Edition and including amendment 38-16
United Nations Recommendations on the Transport of Dangerous Goods – Manual of Tests and Criteria Rev. 6, Amendment 1.
World Health Organization list of National Poison Control Telephone Numbers
United States Environmental Protection Agency – Enforcement Act, EPA 300-N-02-002, the Battery Act.

Disclaimer: This Safety Data Sheet was prepared in accordance with criteria and requirements of the Hazardous Products Act and the Controlled Products Regulations (Canada), SafeWork Australia (Australia), European Union Commission Directives (EU/EC), Japanese Industrial Standard (JIS), Taiwan Bureau of Metrology and Inspection (BSMI), China Regulation GB/T 16483-2008 and the Occupational Safety and Health Administration (OSHA) using information provided by the manufacturer and other sources. The information in the Safety Data Sheet is offered for your consideration and guidance when exposed to these products.

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