

SECTION 1 - PRODUCT IDENTIFICATION AND USE				
Product:	Molicel - Cobalt based Lithium-Ion cell	P.I.N.: Not Regulated		
Use:	High performance lithium-ion rechargeable battery system.	W.H.M.I.S.: exempt. manufactured article		
Manufacturer:	E-One Moli Energy (Canada) Limited 20,000 Stewart Cres. Maple Ridge, BC, Canada V2X 9E7 (604) 466-6654 FAX: (604) 466-6600	24 HOUR EMERGENCY NUMBER (604) 466-6654 (MOLI)		
SECTION 2 - HAZARDOUS INGREDIENTS				
Hazardous Ingredients	%	CAS Number	LD ₅₀ (mg/kg) (oral-rat)	LC ₅₀ (mg/L)
Aluminium foil	0.1- 1 w/w	7429-90-5	N/AV	N/AV
Biphenyl (BP)	0.1-0.3 w/v	92-52-4	2400	N/AV
Copper foil	0.1- 1 w/w	7440-50-8	3.5 (ipr-mouse)	N/AV
Linear and Cyclic Carbonate Solvents (see >Other Information=)	5- 17w/w	N/APP	~11000 (weighted avg)	N/AV
Graphite, powder	10- 30 w/w	7440-44-0	440 (ivn-mouse)	N/AV
Lithium Cobaltite (LiCoO ₂)	10- 30 w/w	12190-79-3	N/AV	N/AV
Lithium Hexafluorophosphate (LiPF ₆)	1- 5 w/w	21324-40-3	1702	Rat: >20
Poly (vinylidene fluoride) (PVDF)	0.1- 1 w/w	24937-79-9	N/AV	N/AV
Steel, nickel and inert polymer	Balance	N/APP	N/APP	N/APP

SECTION 3 - PHYSICAL DATA				
Physical state: Nickel plated metal canister under label		Odour None		Odour threshold: N/APP
Vapour pressure (mmHg) N/APP	Vapour Density (air =1) N/APP	Evaporation rate : N/APP	Boiling Point N/APP	Freezing point N/APP
pH (10% in water) N/APP	Specific gravity: 1.5-2.0	Coeff. of water/oil distribution N/APP	Water solubility: insoluble	Percent Volatiles: NONE
SECTION 4 - FIRE AND EXPLOSION DATA				
Flammability NO	Conditions: Organic components will burn if cell incinerated. Combustion of cell contents will cause evolution of Hydrogen Fluoride.			
Means of Extinction and Special Procedures: Water spray, Carbon Dioxide, Dry chemical powder or appropriate foam. Use agent appropriate for surrounding materials. Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Extremely corrosive Hydrogen Fluoride gas is produced upon combustion of cell contents.				
Flashpoint: NONE		Upper Flammable Limit: NONE		Lower Flammable Limit: NONE
Auto-ignition Temp: NONE	Hazardous Combustion Products: Hydrogen Fluoride, Phosphorus Oxides, Carbon Monoxide, Carbon Dioxide, Lithium Hydroxide, Cobalt Oxides, Aluminium Oxide, possible fluoro-compounds, Carbon soot			
Impact sensitive: NO	Static Discharge Sensitive: NO, but cell may contain up to 4.2 volts.			
SECTION 5 - REACTIVITY DATA				
Stability: STABLE	Hazardous polymerization will not occur. Spontaneous decomposition at normal temperatures will not occur.			
Incompatibilities: Do not crush, puncture, incinerate, immerse in water or heat over 100EC. Steel casing slowly dissolves in strong mineral acids.				
Reactivities: None known				
Hazardous Decomposition Products: Hydrogen Fluoride, Phosphorus Oxides, Carbon Monoxide, Carbon Dioxide, Lithium Hydroxide, Cobalt Oxides, Aluminium Oxide, possible fluoro-compounds, Carbon soot				

SECTION 6 - TOXICOLOGICAL PROPERTIES			
Routes of Entry: Skin Contact: NO Skin Absorption NO Eye contact: NO Inhalation NO Ingestion NO			
Acute Exposure			
Skin:	No effect noticed in routine handling of product. A leaking cell will release corrosive electrolyte.		
Eyes:	The bulk solid has no effect on the eye beyond blunt impact.		
Inhalation:	Not applicable for intact cell. Inhalation of deliberately concentrated vapours from a compromised cell may produce nausea.		
Ingestion:	Ingestion is not likely, given the physical size and state of the cell.		
Chronic Exposure			
Skin:	None anticipated.		
Eyes:	Not applicable.		
Inhalation:	Not applicable.		
Ingestion:	Ingestion is not a likely exposure route.		
Exposure Limits None listed	Irritancy: None	Sensitization: Not anticipated	Carcinogenicity Not anticipated
Teratogenicity: Not anticipated		Mutagenicity: Not anticipated.	
Reproductive toxicity: Not anticipated		Synergistic Products: None expected	
SECTION 7- PREVENTIVE MEASURES			
Personal protective equipment:			
Gloves: Not required for handling individual cells. Fabric gloves for warehouse container handling. Latex gloves are ineffective for a leaking cell.	Respirator: No respirator required for normal handling. SCBA required for fires.	Eyewear: Not required beyond employer policy.	
Clothing: Standard industrial clothing in normal use. Impervious suit in fires.		Footwear: Wear steel-toed footwear if large containers of cells are being handled.	

<p>Engineering controls: Keep away from heat and open flames. Store in a cool, dry place.</p>	
<p>Leak and spill procedure: Evacuate area if fire present or likely. Wear SCBA for fire-related emergencies. Using polyethylene gloves, pick up or sweep up fire-damaged cells, bag individually in plastic bags and place in closed metal containers. 205 Litre lined steel drums are appropriate. Cardboard boxes may be used for small quantities. Avoid raising dust while sweeping. Transport container outdoors. Hold burned cells and fire cleanup solids for disposal as potential hazardous waste. Unburned cells are not hazardous waste. A fire with over 100 kg of cells burnt will likely require reporting to environment officials. Always consult and obey all international, federal and local environmental laws.</p>	
<p>Waste disposal: Always consult and obey all international, federal, provincial/state and local hazardous waste disposal laws. Some jurisdictions require recycling of this spent product. Recycling is encouraged.</p>	
<p>Handling procedures and equipment: Store in a cool, dry place away from sparks and flame. Keep below 125°C. Keep above -60°C. Charge between 0°C and 45°C. Use only approved charging equipment. Do not disassemble battery or battery pack. Do not puncture, crush or dispose of in fire.</p>	
<p>Storage requirements: Store at room temperature for best results.</p>	
<p>Special Shipping Information: Not regulated. This product is made from materials with no detectable mercury. This product is made from materials with no detectable lead. Equivalent lithium content as per Section 38.3.2 of the UN Manual of Tests and Criteria (ST/SG/AC.10/11/27 Add. 2): Equivalent grams of lithium is equal to 0.3 times the rated Amp-hour capacity of the individual cell, regardless of cell size. 1.8 Ah = 0.54 g 2.0 Ah = 0.60 g 2.2 Ah = 0.66g 2.4 Ah = 0.72 g This product meets the transportation requirements of the US Department of Transportation (DOT), ICAO and IATA special provision A45 and is classified as non-dangerous goods.</p>	
SECTION 8 - FIRST AID MEASURES	
Skin:	Not a health hazard. In case of skin contact with electrolyte, wash with copious amounts of water and seek 1 st aid.
Eyes:	Not an eye hazard. In case of eye contact with a leaking cell, flush with copious amounts of tempered water for at least 15 minutes and seek 1 st aid.
Inhalation:	Not an inhalation hazard.

Ingestion: If swallowed, seek emergency medical aid. If patient choking and can partially breathe, encourage patient to cough. Do not strike patient's back. This may lodge cell further in throat. If patient is not breathing, perform standing Heimlich manoeuvre until object is dislodged or patient becomes unconscious. An unconscious patient should be lowered gently to the floor on their back and abdominal thrusts performed continuously until cell is ejected from throat or medical aid arrives.

SECTION 9 - PREPARATION INFORMATION

Prepared by: Martin RIDGWAY, B.Sc. Safety Co-ordinator	Phone: (604) 466-6654	Date Created: Mar 31, 1995	Revision Information: First Issue
		Date Last Revised: Jul 31, 1998	Revision Information: Assign document control number. Company name change.
		Date Last Revised: Jun 15, 2000	Revision Information: Company name change.
		Date Last Revised: Jan 23, 2001	Revision Information: Shipping: Contains no mercury.
		Date Last Revised: May 1, 2001	Revision Information: Incompatibilities – Do not heat over 100C (to match UL warning statement)
		Date Last Revised: Jan 28, 2003	Revision Information: Shipping Information – Added equivalent lithium content information
		Date Last Revised: Mar 19, 2003	Revision Information: Decomposition Products – Removed Boron Oxide
		Date Last Revised: May 14, 2003	Revision Information: Shipping Information – Added information on Special Provision A45
		Date Last Revised: Dec 16, 2003	Revision Information: Shipping Information – Contains no lead.
		Date Last Revised: Jun 30, 2005	Revision Information: Toxicological information – Add information on leaking cell. First Aid - Add leaking cell skin and eye contamination

Approval

OTHER INFORMATION

The above information is believed to be correct but does not purport to be all-inclusive and shall be used only as a guide. Exact composition information is immediately available on a confidential basis to medical professionals treating exposure to cell components or combustion by-products.

HYDROFLUORIC ACID EXPOSURE DURING FIRE FIGHTING

This information is given for the use of professional fire fighters responding to a warehouse fire where fire from other materials may incinerate Mollicels. This section is provided solely in case of exposure, during fire fighting, to the combustion by-products. Hydrofluoric acid is not present in the product. Contact with Mollicels causes none of the following symptoms.

Hydrofluoric acid is extremely corrosive. Contact with hydrogen fluoride fumes is to be avoided. Permissible exposure limit is 3 ppm. In case of contact with hydrogen fluoride fumes, immediately leave the area and seek first aid **and** emergency medical attention. Symptoms may have delayed onset. Fluoride ions penetrate skin readily causing destruction of deep tissue layers and even bone. Fluoride interferes with nerve impulse conduction causing severe pain or absence of sensations. Immediately flush eyes or skin with water for at least 20 minutes to neutralize the acidity and remove some fluoride. Remove and destroy all contaminated clothing and permeable personal possessions. Before re-use, impermeable possessions should be soaked in benzalkonium chloride after water washing. Following flushing of the affected areas, an iced aqueous solution of benzalkonium chloride or 2.5 % calcium gluconate gel should be applied to react with the fluoride ion. Compresses and wraps may be used for areas where immersion is not practical. Medicated dressing should be changed every 2 minutes. Exposure to hydrofluoric acid fumes sufficient to cause pain requires immediate hospitalization for monitoring for pulmonary edema.