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File Number: SDS\_2590\_R01

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## SAFETY DATA SHEET

### Section 1 -- Product and Company Identification

#### PRODUCT IDENTIFICATION

Product Name: Rechargeable Lithium Ion Battery Pack

Product Model No.: BB-2590/U

Inventus Part No.: N/A

#### COMPANY NAME:

Inventus Power, Inc.

1200 Internationale Parkway, Woodridge IL 60517

Emergency telephone number:

Inside the US: 1-800-535-5053

Outside the US: 001-352-323-3500

#### MANUFACTURING SITE:

Inventus Power, Inc.

1200 Internationale Parkway, Woodridge IL 60517

Emergency telephone number:

Inside the US: 1-800-535-5053

Outside the US: 001-352-323-3500


## Section 2 -- Composition / Information on Ingredients

### Battery Product Matrix

Inventus Power P/N	Customer P/N	Pack Configuration	Pack Nominal Voltage V	Pack Nominal Capacity (Ah)	Pack Energy (Wh)
BB-2590/U	BB-2590/U	2 x 4S3P	14.4	20	288

### Chemical Composition:

Component	Material	Formula	CAS Number	Percentage range (wt %)
Positive Electrode	Lithium Cobalt Oxide	LiCoO <sub>2</sub>	1307-96-6	--
	Manganese Oxide	MnO <sub>2</sub>	1313-13-9	
	Nickel Oxide	NiO	1313-99-1	
Negative Electrode	Graphite	C	7440-44-0	--
	Copper			
	Aluminum			
Electrolyte	Ethylene Carbonate – Solvent	C <sub>3</sub> H <sub>4</sub> O <sub>3</sub>	96-49-1	--
	Diethyl Carbonate – Solvent	C <sub>5</sub> H <sub>10</sub> O <sub>3</sub>	105-58-8	--
	Lithium Hexafluorophosphate – Salt	LiPF <sub>6</sub>	21324-40-3	--
Housing	Lexan EXL9330		111211-39-3	

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### Section 3 -- Hazards Identification

Under normal usage, there is no contact with electrolyte and no hazard exists. If exposed to high temperature or fire, cell may leak electrolyte and in extreme cases explode. The vented gas may contain among others Hydrogen Fluoride.

### Section 4 -- First Aid

Under normal operating condition, contents of the cells are in sealed (polymer pouch/metal can or cylinder) condition and pose no threat to the user. Exposure to the cell internal content happens under abusive conditions.

**Inhalation:** Contents of open battery may cause respiratory irritation. Move to fresh air immediately and seek medical attention.

**Skin:** Contents of open battery may cause skin irritation. Wash skin with copious amount of soap and water.

**Eye:** Contents of open battery may cause eye irritation. Flush eyes immediately with water for at least 15 minutes and seek medical attention.

**Ingestion:** Seek medical attention immediately. Induce vomiting.

### Section 5 -- Fire Fighting

In case of Fire use CO2 or CLASS D fire extinguisher

In case battery burns with other combustible, use corresponding fire extinguisher. Corrosive fumes may be present during fire. Use protective equipment (gloves, breathing apparatus, goggles etc.)

Gases from the burning fire will include Hydrogen Fluoride, Carbon oxides, Hydrocarbons among others.

### Section 6 -- Accidental Release

Battery material is enclosed in either metal casing or in laminate and does not release easily under normal usage. Under abuse condition such as puncture, high heat exposure, electrical abuse electrolyte containing vinyl chloride salt in organic solvent may leak out. See section 4 for first aid measure. Seek medical attention.

## Section 7 -- Instructions on Safe Handling and Use

**Storage:** Store within the recommended temperature limit of the battery (read instruction manual for specific limits). Do not expose to high temperature (60°C/140°F). Avoid short circuit of the battery. Short circuit of the battery may cause release of gas and may pose burn hazard.

**Handling:** Do not disassemble, crush or otherwise abuse the battery. Do not open the battery.

**Charge:** Charge only with dedicated/specific chargers designed for this battery

**Discharge:** Discharge within the temperature limits of the battery detailed in the specification.

**Disposal:** Dispose/Recycle according to the applicable municipal, state and federal regulations. Do not dispose in household or commercial waste bin.

**Caution:** This battery when abused may pose fire, explosion and severe burn hazard. Handle with caution.


## Section 8 -- Exposure Control and Special Protection Information

• Control parameters

Common chemical name / General name	ACGIH (2009)	
	TLV-TWA	BEI
Lithium transition metal oxidate	0.02mg/m <sup>3</sup> (as cobalt) * 0.2mg/m <sup>3</sup> (as manganese) * 0.2 mg/m <sup>3</sup> (as nickel) *	-
Aluminum	10mg/m <sup>3</sup> (metal coarse particulate) 5mg/m <sup>3</sup> (inflammable powder) 5mg/m <sup>3</sup> (weld fume)	-
Carbon (Natural graphite) (Artificial graphite)	2mg/m <sup>3</sup> (inhalant coarse particulate)	-
Copper	0.2mg/m <sup>3</sup> (fume) 1.0mg/m <sup>3</sup> (a coarse particulate, Mist)	-
Organic electrolyte	-	-

ACGIH: American Conference of Governmental Industrial Hygienists, Inc.  
 TLV-TWA: Threshold Limit Value-Time Weighted Average concentration  
 BEI: Biological Exposure Indices

Eye Protection, gloves, ventilation, are not needed under normal usage  
 Use safety goggles, acid resistant safety gloves, air mask if exposed to internal content of the cell/battery.

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## Section 9 -- Physical and Chemical Properties

Appearance: Solid  
Form Factor: Mostly cylindrical  
Odor: N/A  
PH: N/A  
Flash Point: N/A  
Density: N/A  
Solubility: Insoluble in Water

## Section 10 -- Stability and Reactivity


Not reactive under normal condition of usage.  
Note safe handling procedure.  
Avoid high temperature and mechanical abuse.  
Read label and manufacturer instruction before usage.

## Section 11 -- Toxicological Effect

Acute Toxicity:  
Not known for Lithium Cobaltate, Aluminum, and Graphite.  
Copper causes gastrointestinal disturbance in 60-100mg sized coarse particulate. TDLo-Rabbit 375mg/kg  
Organic electrolyte LD50, oral - -Rat 2000mg/kg or more  
Local Effects:  
Not known for Lithium Cobaltate, Graphite and Organic Electrolyte.  
Aluminum has no known local effects.  
Copper in coarse particulate is eye irritant  
No known carcinogen in this product.

## Section 12 -- Ecological Information

Battery is not biodegradable. Do not dispose in landfill. Please follow local regulations regarding recycle and disposal.

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### Section 13 -- Disposal Information

Dispose/Recycle according to the applicable municipal, state and federal regulations. Do not dispose in household or commercial waste bin.

### Section 14 -- Transportation Information

Proper Shipping Name: Lithium Ion Batteries.

The UN number for the battery pack is UN3480, and it also can be UN3481 when the battery pack contained in the equipment or packed with the equipment.

The battery meets the requirements of the test in the United Nations (UN) Manual of Tests and Criteria, Part III, sub-section 38.3


DOT: Refer to Attachment ERG 2016 guide 147 (Lithium Ion battery Guide)

IMDG: Refer to IMDG/Ocean Transport ENS F-A, S-I

IATA: Refer to IATA-ICAO/Air Transport ERG CODE 12FZ

When large amount of batteries is transported by ship, vehicle and railroad, avoid high temperature and dew condensation.

Avoid transportation which may cause damage of package.

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## Section 15 -- Regulatory Information

The transport of rechargeable lithium-ion batteries is regulated by various bodies, (IATA, IMO, US-DOT)

That follow the United Nations "Recommendations on the Transport of Dangerous Goods. Regulations specifically applicable to the product:

ICAO 2019/2020 Edition of ICAO Technical Instructions for the Safety Transport of Dangerous Goods by Air

IMO IMDG Amendment 39-18 2018 Edition. And the battery pack complies with the special provision 188 of the IMDG CODE.

IATA 61st Edition (2020) of the IATA Dangerous Goods Regulations (DGR)

US Department of Transportation DOT (49 CFR 100-185), (USA)

OSHA hazard communication standard (29 CFR 1910.1200)

Hazardous

V Non-Hazardous

This battery meets the requirements of Packing Instructions 965, section IA of the IATA regulation when air shipped

## Section 16 -- Other Information

The information contained in this Safety data sheet is based on the present state of knowledge and current legislation.

This safety data sheet provides guidance on health, safety and environmental aspects of the product and should not be construed as any guarantee of technical performance or suitability for particular applications.