



# Lithium Battery Safety Document – Section II or Section IB Shipments

AWB or Tracking Number: \_\_\_\_\_

This document may be used to comply with the additional documentation requirements of the IATA DGR.

**WARNING:** LITHIUM BATTERIES THAT HAVE BEEN RECALLED BY THE MANUFACTURER FOR SAFETY REASONS **MUST NOT** BE SHIPPED BY AIR.

### Terminology:

- Cell – *electrochemical unit, consisting of an anode and a cathode, capable of generating electrical current*
- Battery – *assembly of cells*
- Lithium ion cells/batteries – *generally rechargeable – includes lithium polymer cells/batteries*
- Lithium metal cells/batteries – *non-rechargeable*

This shipment contains lithium cells or batteries in the following configuration (check applicable description):

Lithium Ion - Maximum of <ul style="list-style-type: none"> <li>• 20 Watt-hours per cell or</li> <li>• 100 Watt-hours per battery</li> </ul>	Lithium Metal – Maximum of <ul style="list-style-type: none"> <li>• 1 gram of lithium metal per cell or</li> <li>• 2 grams of lithium metal per battery</li> </ul>
<input type="checkbox"/> <b>Cells or batteries <u>only</u> (Lithium ion batteries in compliance with Section II of PI 965, UN 3480) - Cells or batteries in a package, without electronic equipment:</b> <b>Package Limit:</b> ≤2.7 Wh = 2.5 kg; <u>or</u> >2.7 Wh but ≤ 20 Wh = 8 cells; <u>or</u> >2.7 Wh but ≤ 100 Wh = 2 batteries	<input type="checkbox"/> <b>Cells or batteries <u>only</u> (Lithium metal batteries in compliance with Section II of PI 968, UN 3090) - Cells or batteries in a package, without electronic equipment.</b> <b>Package Limit:</b> ≤0.3 g = 2.5 kg; <u>or</u> >0.3 g but ≤ 1 g = 8 cells; <u>or</u> >0.3 g but ≤ 2g = 2 batteries
<input checked="" type="checkbox"/> <b>Cells or batteries <u>only</u> (Lithium ion batteries in compliance with Section IB of PI 965, UN 3480) - Cells or batteries in a package, without electronic equipment</b> <i>Packages must be limited to 10 kg net weight of batteries.</i>	<input type="checkbox"/> <b>Cells or batteries <u>only</u> (Lithium metal batteries in compliance with Section IB of PI 968, UN 3090) - Cells or batteries in a package, without electronic equipment</b> <i>Packages must be limited to 2.5 kg net weight of batteries..</i>
<input type="checkbox"/> <b>Packed <u>with equipment</u> (Lithium ion batteries in compliance with Section II of PI 966, UN 3481) - Cells or batteries contained in a package with associated electronic equipment.</b>  <i>Packages must be limited to 5 kg net weight of batteries.</i>	<input type="checkbox"/> <b>Packed <u>with equipment</u> (Lithium metal batteries in compliance with Section II of PI 969, UN 3091) - Cells or batteries contained in a package with associated battery-powered equipment – with the batteries not installed in the equipment.</b> <i>Packages must be limited to 5 kg net weight of batteries.</i>
<input type="checkbox"/> <b>Contained <u>in equipment</u> (Lithium ion batteries in compliance with Section II of PI 967, UN 3481) - Cells or batteries installed in equipment.</b> <i>Packages must be limited to 5 kg net weight of batteries.</i>	<input type="checkbox"/> <b>Contained <u>in equipment</u> (Lithium metal batteries in compliance with Section II of PI 970, UN 3091) - Cells or batteries installed in equipment.</b> <i>Packages must be limited to 5 kg net weight of batteries.</i>

- This package must be handled with care. A flammability hazard exists if the package is damaged.
- If this package is damaged in transportation, it must not be loaded until the condition of the contents can be verified. The batteries contained in this package must be inspected for damage and may only be repacked if they are intact and protected against short circuits.
- For more information about the batteries contained in this package, call the following telephone number:


**CHEMTREC for Lithium Battery Information Number:**

**For EMERGENCY information call 800-424-9300 or outside the United States call 703-527-3887**



210-06806+A0



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File Number: SDS\_5463\_QX\_2023\_R01  
Date: 2023-01-01

## Section 1 -- Product and Company Identification

Product Name: Rechargeable Li-ion Battery

Product Model No.: BAT 2S1P-2

Inventus Part No: 5463.001&5463.201

**COMPANY NAME:**

Inventus Power, Inc.

1200 Internationale Parkway, Woodridge IL 60517

**EMERGENCY TELEPHONE NUMBER:**

Inside the US: 1-800-424-9300

Outside the US: 1-703-527-3887

**MANUFACTURING SITE:**

Name: ICC Electronics (Dongguan) Ltd.

Address1: No.23, Shang Yuan Road, QingXi Town, Dongguan City, Guangdong Province, China

Telephone number: +86 769 87731085

Emergency telephone number: +86 769 87731085

## 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)
5462.101 5463.201	BAT 2S1P-2	2S1P	6.4	1.1	7.04



210-06820+D0

### Battery Chemical Composition:

Component	Material	Formula	CAS Number	Percentage range (wt %)
Positive Electrode	Lithium Nickel Cobalt manganese Oxide	LiNiMnCoO2	182442-95-1	25~33%
Negative Electrode	Graphite	C	7440-44-0	15~25%
Electrolyte	Ethylene Carbonate	C <sub>3</sub> H <sub>4</sub> O <sub>3</sub>	96-49-1	2~5%
	Diethyl Carbonate	C <sub>5</sub> H <sub>10</sub> O <sub>3</sub>	105-58-8	2~5%
	Lithium Hexafluorophosphate	LiPF <sub>6</sub>	21324-40-3	15-22%
Outer case	Aluminium	Al	7429-90-5	5%
	Copper	Cu	7440-50-8	5%
	Iron	Fe	7439-89-6	5%

## Section 3-- Hazards Identification

Under normal usage, there is no contact with electrolyte and no hazard exists. Abusive conditions such as crush, severe drop, puncture etc. must be avoided as that can lead to fire and explosion of the battery. 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.

The information in this section relates to unusual conditions resulting from abuse in which the battery electrodes and electrolytes are exposed.

Most severe hazard present in case of fire. Fire can cause explosion, exposure to toxic fume/Vapor

#### i. GHS Classification

Skin irritation	(Category 2)
Skin sensitization	(Category 1)
Eye irritation	(Category 2)
Single target organ, toxicity, single exposure	(Category 3)
Carcinogen	(Category 1B)


#### ii. GHS Label elements, including precautionary statements

Pictograms



Signal word

Danger/Warning

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iii. Hazard statements

H315 Causes skin irritation in case of breach of battery casing  
H317 May cause an allergic skin reaction  
H319 Causes serious eye irritation in case of leak or spill of electrolyte, again under abuse conditions  
H335 May cause respiratory irritation when exposed to fumes from fire, but not under normal usage conditions  
R10 Flammable

iv. Precautionary statements

P280 Wear protective gloves/protective clothing/eye protection / face protection.  
P312 Call a POISON CENTER or doctor/ physician if exposed to fumes or electrolyte  
P313 Get Medical Attention  
P302 + P350 IF ON SKIN: Gently wash with plenty of soap and water.  
P301 + P330 + P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.  
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.  
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.

## 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 ABC 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.

Contain the spillage with sand or vermiculite and if necessary bunding.

Do not dispose of spillage waste into regular waste stream.

## 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:

Components with workplace controls:

Graphite CAS 7782-42-5	TWA	2.5 mg/m <sup>3</sup>	USA, NIOSH recommended exposure limits
		5 mg/m <sup>3</sup>	USA, OSHA limits for air contaminants
		5 mg/m <sup>3</sup>	USA, OSHA occupational exposure limits
		3 mg/m <sup>3</sup>	Australian workplace exposure standards for airborne contaminants
	TWA	2 mg/m <sup>3</sup>	Canada, British Columbia OEL Canada, Alberta OEL
Lithium CAS 21324-40-3 hexafluorophosphate	TWAEV	5 mg/m <sup>3</sup>	Canada, Quebec OELs
	TWA	2.5 mg/m <sup>3</sup>	USA, OSHA limits for air contaminants
			USA, OSHA occupational exposure limits
	TLV	2.5 mg/m <sup>3</sup>	USA, ACGIH Threshold Limit Value
	TWA	2.5 mg/m <sup>3</sup>	Australian workplace exposure standards for airborne contaminants
			Canada, British Columbia OEL Canada, Alb. OEL
TWAEV	2.5 mg/m <sup>3</sup>	Canada, Quebec OELs	

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#### Engineering Controls:

Have eye bath available.

Use non-sparking tools.

Protective Equipment: Wear chemical-resistant gloves and chemical safety goggles.

Hygiene: Follow good industrial hygiene procedures. Keep away from food, beverages.

Use safety precautions for handling high voltage, high wattage battery.

Use safety goggles, acid resistant safety gloves, air mask if exposed to internal content of the cell/battery.

## Section 9 -- Physical and Chemical Properties

Appearance: Solid

Form Factor: Mostly rectangular

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, high humidity and mechanical abuse, short circuit, and sparks

Read label and manufacturer instruction before usage and disposal

## Section 11 -- Toxicological Effect

#### Acute Toxicity:

Not known for Lithium Cobaltate, Aluminum, and Graphite or Lithium Iron Phosphate.

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 or Lithium Phosphate.

Aluminum has no known local effects.

Copper in coarse particulate is eye irritant

No known carcinogen in this product.

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## Section 12 -- Ecological Information

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

No data available on aquatic toxicity, Bio accumulative potential, Mobility in soil.

## Section 13 -- Disposal Information

Dispose/Recycle according to the applicable municipal, state, and federal regulations. Do not dispose in household or commercial waste bin or stream. Battery label contains Eu Battery directive compliant marking. Follow local and federal regulations for disposal and recycle of lithium-ion batteries.

## Section 14 -- Transportation Information

Proper Shipping Name: Lithium-Ion Battery

Lithium-ion batteries are hazardous material/ dangerous goods per US and international transportation authority (IATA, USDOT, IMDG, ADR etc.)

This battery is 7.04 Wh and is shipped as fully regulated class 9 hazardous material/dangerous goods.

UN number for the battery pack is UN3480.

UN number is UN3481 when the battery pack is contained in the equipment or packed with the equipment.

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

DOT: 49CFR 173.185

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

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

Avoid transportation which may cause damage of package. Keep in original packaging. Do not transport damaged containers.

## Section 15 -- Regulatory Information


This product is considered an article under the chemical inventories listed below and consequently is exempt from listing on these inventories:

- US EPA Toxic Substance Control Act (TSCA)
- European Inventory of Existing Chemical Substances (EINECS/ELINCS)
- Other International Regulations

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:



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ICAO 2023/2024 Edition of ICAO Technical Instructions for the Safety Transport of Dangerous Goods by Air  
 IMO IMDG Amendment 40-20 2020 Edition. battery pack complies with the special provision 188 of the IMDG  
 CODE.

IATA 64<sup>th</sup> Edition (2023) 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)

This battery is shipped as fully regulated class 9 hazardous material, Packing Instruction PI965, IB for Packs  
 ≤100Wh

This battery is shipped as fully regulated class 9 hazardous material (classified as small battery per USDOT  
 49CFR)

Batteries shipped with or contained in equipment must follow IATA Packing Instruction 966, Section II or PI967,  
 Section II based on battery capacity

Shipment must accompany dangerous goods shipping paper.

Employees handling lithium-ion batteries must receive dangerous goods/hazmat training.

## 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 applications.

Although the electrolyte contains chemicals that by itself can cause harm, it is not present in an amount or form  
 to cause splash.

# UN38.3 Lithium Battery(Cell) Test Summary

## UN38.3 锂电池(电芯)试验概要

No. : RZUN2017-3974-M1-TS

Cell or Battery Information 电池/电芯信息		
Name 名称:	Rechargeable Lithium Ion Battery Pack/可充电锂电池包	
Type/Model 型号:	BAT 2S1P-2 6.4V 1100mAh 7040mWh	
Color 颜色:	White/白色	
Shape 形状:	Irregular Shape/不规则形状	
Completed Battery/Cell Mass 电池/电芯整体质量	160.3g	
<input checked="" type="checkbox"/>	Belongs to Lithium-ion Battery, the Wh rating is 属于锂离子电池/电芯, 瓦时数为	7040mWh
<input type="checkbox"/>	Belongs to Lithium metal Battery, the Lithium content is 属于锂金属电池/电芯, 锂金属含量为	
Other Physical Description: 其它相关描述: —		

Manufacturer Information 制造商信息			
Manufacturer: 制造商:	ICC Electronics (Dongguan) Ltd. / Fabricators International Ltd. 辉碧电子(东莞)有限公司		
Address: 地址:	No.23, Shangyuan Road, Qingxi Town, Dong Guan City, Guangdong, P. R. China 广东省东莞市清溪镇上元路 23 号		
Telephone 电话:	020-39298880-6800	Email 电邮:	andy.quan@inventuspower.com
Website 网址:	www.inventuspower.com		

Laboratory Information 检测实验室信息					
Laboratory: 检测实验室:	Vkan Certification & Testing Co., Ltd. 威凯检测技术有限公司				
Address: 地址:	No.3,Tiantaiyi Road, Kaitai Avenue, Science City, Guangzhou P. R. China. 中国 广州市科学城开泰大道天泰一路 3 号				
Tel 电话:	86-020-32293888	Email 电邮:	office@cvc.org.cn	Website 网址:	http://www.cvc.org.cn

UN38.3 Test conducted and results UN38.3 试验项目和结果			
Test Report ID 检测报告编号:	RZUN2017-3974-M1	Date of Test Report 检测报告签发日期:	2018-12-18
Manual of Test and Criteria version / amendment: 试验和标准手册版本号/修订版:	ST/SG/AC.10/11/Rev.6/Section 38.3		

List of Tests Completed 已完成的试验项目清单			
Test Items 试验项目	Pass 通过	Fail 失败	Reference to assembled battery testing requirement: 关于组合电池的试验要求:
<input checked="" type="checkbox"/> T1 Altitude Simulation 高度模拟	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Not applicable 不适用  <input type="checkbox"/> Applicable, reference to 38.3.3 (f) 适用于 38.3.3 (f)  <input type="checkbox"/> Applicable, reference to 38.3.3 (g) 适用于 38.3.3 (g)  Other executive standards/其他执行标准:
<input checked="" type="checkbox"/> T2 Thermal Test 热冲击	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> T3 Vibration 振动	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> T4 Shock 冲击	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> T5 External Short Circuit 外部短路	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> T6 Impact/ Crush 撞击/ 挤压	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> T7 Overcharge 过充电	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> T8 Forced Discharge 强制放电	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

**Note: The test results of this summary are only valid for the tested samples listed in test report RZUN2017-3974-M1.**

注: 此摘要的测试结果仅对测试报告 RZUN2017-3974-M1 中列出的测试样品有效

Title/职务: Manager/经理

Signatory/签发人:

黄鲲

Stamp of CVC  
CVC 印章:



210-06694+C0

LTC-R-4279-UN38.3-A2