Lithium Battery Safety Document – Section II or Section IB Shipments

AWB or Tracking Number: SEE BILL OF LADING (BOL) FOR TRACKING INFORMATION

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 • **20 Watt-hours per cell or** • **100 Watt-hours per battery**	**Lithium Metal – Maximum of** • **1 gram of lithium metal per cell or** • **2 grams of lithium metal per battery**
☒ **Cells or batteries only (Lithium ion batteries in compliance with Section II of PI 965, UN 3480) -** *Cells or batteries in a package, without electronic equipment:* **Package Limit:** ≤2.7 Wh = 2.5 kg; or >2.7 Wh but ≤ 20 Wh = 8 cells; or >2.7 Wh but ≤ 100 Wh = 2 batteries	☐ **Cells or batteries only (Lithium metal batteries in compliance with Section II of PI 968, UN 3090) -** *Cells or batteries in a package, without electronic equipment.* **Package Limit:** ≤0.3 g = 2.5 kg; or >0.3 g but ≤ 1 g = 8 cells; or >0.3 g but ≤ 2g = 2 batteries
☐ **Cells or batteries only (Lithium ion batteries in compliance with Section IB of PI 965, UN 3480) -** *Cells or batteries in a package, without electronic equipment* *Packages must be limited to 10 kg net weight of batteries.*	☐ **Cells or batteries only (Lithium metal batteries in compliance with Section IB of PI 968, UN 3090) -** *Cells or batteries in a package, without electronic equipment* *Packages must be limited to 2.5 kg net weight of batteries.***.**
☐ **Packed with equipment (Lithium ion batteries in compliance with Section II of PI 966, UN 3481) -** *Cells or batteries contained in a package with associated electronic equipment.* *Packages must be limited to 5 kg net weight of batteries.*	☐ **Packed with equipment (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.* *Packages must be limited to 5 kg net weight of batteries.*
☐ **Contained in equipment (Lithium ion batteries in compliance with Section II of PI 967, UN 3481) -** *Cells or batteries installed in equipment.* *Packages must be limited to 5 kg net weight of batteries.*	☐ **Contained in equipment (Lithium metal batteries in compliance with Section II of PI 970, UN 3091) -** *Cells or batteries installed in equipment.* *Packages must be limited to 5 kg net weight of batteries.*

- 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

File Number: SDS_4465_R01
Date: 2020-Dec-8

SAFETY DATA SHEET

Section 1 -- Product and Company Identification

PRODUCT IDENTIFICATION

Product Name: Rechargeable Lithium Ion Battery

Product Model No.: 271-00029

Inventus Part No.: 03-54465-001

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:

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

210-06813+B0

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)
03-54465-001	271-00029	2S1P	7.2	2.9	20.9

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	7782-42-5	15~25%
Electrolyte	Polyvinylidine Fluoride	C2H2F2	24937-79-9	0.5~1%
	Lithium hexafluorophosphate	LiPF6	21324-40-3	15-27%
Outer case	Aluminium	Al	7429-90-5	5%
	Cupper	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.
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 Handing 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^3 (as cobalt) * 0.2mg/m^3 (as manganese) * 0.2 mg/m^3 (as nickel) *	-
Aluminum	10mg/m^3 (metal coarse particulate) 5mg/m^3 (inflammable powder) 5mg/m^3 (weld fume)	-
Carbon (Natural graphite) (Artificial graphite)	2mg/m^3 (inhalant coarse particulate)	-
Copper	0.2mg/m^3 (fume) 1.0mg/m^3 (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.

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.

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 2020 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.

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 2021/2022 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 62nd Edition (2021) 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 II or section IB of the IATA regulation.

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.

UN38.3 Lithium Battery(Cell) Test Summary
UN38.3 锂电池(电芯)试验概要

No. : RZUN2017-3988-M1-TS

Cell or Battery Information 电池/电芯信息			
Name 名称:	Rechargeable Lithium-ion Battery/可充电锂离子电池		Other Physical Description: 其它相关描述: —
Type/Model 型号:	271-00029 7.2V 2.9Ah 20.9Wh		
Color 颜色:	White/白色		
Shape 形状:	Prismatic/棱柱形		
Completed Battery/Cell Mass 电池/电芯整体质量	110.1g		
☒	Belongs to Lithium-ion Battery, the Wh rating is 属于锂离子电池/电芯，瓦时数为	20.9Wh	
☐	Belongs to Lithium metal Battery, the Lithium content is 属于锂金属电池/电芯，锂金属含量为		

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 检测试验室信息					
Laboratory: 检测试验室:	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:	RZUN2017-3988-M1	Date of Test Report 检测报告签发日期:	2019-01-23
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
☒ T1 Altitude Simulation 高度模拟	☒	☐
☒ T2 Thermal Test 热冲击	☒	☐
☒ T3 Vibration 振动	☒	☐
☒ T4 Shock 冲击	☒	☐
☒ T5 External Short Circuit 外部短路	☒	☐
☒ T6 Impact/ Crush 撞击/ 挤压	☒	☐
☒ T7 Overcharge 过充电	☒	☐
☒ T8 Forced Discharge 强制放电	☒	☐

Reference to assembled battery testing requirement:
关于组合电池的试验要求:

- ☒ Not applicable 不适用
- ☐ Applicable，reference to 38.3.3 (f) 适用于 38.3.3 (f)
- ☐ Applicable，reference to 38.3.3 (g) 适用于 38.3.3 (g)

Other executive standards/其他执行标准:

Note：The test results of this summary are only valid for the tested samples listed in test report RZUN2017-3988-M1.

注：此摘要的测试结果仅对测试报告 RZUN2017-3988-M1 中列出的测试样品有效

Title/职务: Manager/经理

Signatory/签发人: 黄鹏

Stamp of CVC
CVC 印章:

210-06689+C0