Safety Data Sheet

Rechargeable Lithium Ion Battery Pack

* * * Section 1 - Product and Company Identification * * *

Part Numbers: BL2005; BL2005-BULK; BL2010; BL2010-BULK; BL2012; BL2012-BULK; BL2022; BL2022-BULK; BL4011, BL4011-BULK

Distributor Information

Ingersoll Rand
Industrial Technologies
800-D Beaty St.
Davidson, NC 28036

Product Support: 1-800-866-5457 (Opt.2)

Emergency # CHEMTREC 1-800-424-9300

* * * Section 2 - Hazards Identification * * *

This product is a manufactured article as defined by GHS and is not classified. However, it contains hazardous chemicals that may be released if the product is damaged or mishandled. The following classification information is for the components within the product. Exposure to these hazardous chemicals is not anticipated with normal use of the product.

GHS Classification:

Acute Toxicity Inhalation - Category 3
Skin Corrosion/Irritation - Category 1B
Eye Damage/Irritation - Category 1
Carcinogenicity - Category 1A
Specific Target Organ Toxicity Repeat Exposure - Category 1

GHS LABEL ELEMENTS

Symbol(s)

Signal Word

Danger

Hazard Statements

Toxic if inhaled.
Causes severe skin and eye damage.
May cause cancer.
Causes damage to organs (kidneys, liver, nervous system) through prolonged or repeated exposure.

Precautionary Statements

Prevention

Do not breathe dust/fume/gas/mist/vapors/spray.
Wash thoroughly after handling.

Do not eat, drink or smoke when using this product.
Wear protective gloves/protective clothing/eye protection/face protection.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.

Response

If swallowed: Rinse mouth. Do NOT induce vomiting. Immediately call a poison center/doctor.
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse.
If inhaled: Remove person to fresh air and keep comfortable for breathing.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor.

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 3 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
7440-44-0	Carbon	<30
1313-99-1	Nickel oxide	<30
1313-13-9	Manganese dioxide	<30
1307-96-6	Cobalt(II) oxide	<30
Not Available	Electrolyte *	<20
24937-79-9	Polyvinylidene fluoride (PVdF)	<10
Not Available	Aluminum and inert materials	5-10
7440-50-8	Copper	2-10
7429-90-5	Aluminum	2-10

Component Information/Information on Non-Hazardous Components

General Product Information

* The electrolyte is comprised of the following ingredients:

21324-40-3	Phosphate(1-), hexafluoro-, lithium
616-38-6	Dimethyl carbonate
623-53-0	Carbonate, methyl ethyl
96-49-1	Ethylene carbonate

Because of the cell structure, these ingredients will not be available if used properly. During the charge process a lithium graphite intercalation phase is formed.

Mercury content: Hg < 0.1mg/kg
Cadmium content: Cd < 1mg/kg
Lead content: Pb< 10mg/kg

* * * Section 4 - First Aid Measures * * *

The following first aid measures are necessary in case of exposure to interior battery components in a damaged battery casing. Undamaged batteries do not represent a health hazard.

First Aid: Eyes

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor.

First Aid: Skin

Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse.

First Aid: Ingestion

Rinse mouth. Do NOT induce vomiting. Immediately call a poison center/doctor.

First Aid: Inhalation

Remove person to fresh air and keep comfortable for breathing.

* * * Section 5 - Fire Fighting Measures * * *

General Fire Hazards

See Section 9 for Flammability Properties.
Cell is not flammable but internal organic material will burn if the cell is incinerated.

Hazardous Combustion Products

In case of fire, the formation of the following flue gases cannot be excluded: Hydrogen fluoride (HF), Carbon monoxide and carbon dioxide. May form hydrofluoric acid if electrolyte comes into contact with water.

Extinguishing Media

Cold water and dry powder in large amounts are applicable. Use metal fire extinction powder or dry sand if only a few cells are involved.

Unsuitable Extinguishing Media

None

Fire Fighting Equipment/Instructions

Firefighters should wear self-contained breathing apparatus and protective suit. If possible, remove cell(s) from fire fighting area. If heated above 125°C, cell(s) can explode/vent.

* * * Section 6 - Accidental Release Measures * * *

Recovery and Neutralization

None

Materials and Methods for Clean-Up

Avoid contact with skin, eyes and clothing. Avoid breathing fume and gas. Absorb spill on inert material and contain for proper disposal.

Emergency Measures

Isolate area. Keep unnecessary personnel away.

Personal Precautions and Protective Equipment

Wear appropriate protective equipment and clothing during clean-up.

Environmental Precautions

Do not discharge into the drains/surface waters/groundwater.

Prevention of Secondary Hazards

None

* * * Section 7 - Handling and Storage * * *

Handling Procedures

Avoid short circuiting the cell. Avoid mechanical damage of the cell. Do not open or disassemble. Keep away from open flames, hot surfaces and sources of ignition.

Storage Procedures

Store at room temperature (approx. 20°C) at approx. 20-60% of the nominal capacity (OCV approx. 3.6 - 3.9 V/cell). Keep in closed original container.

Incompatibilities

None

* * * Section 8 - Exposure Controls / Personal Protection * * *

Component Exposure Limits

Aluminum (7429-90-5)

ACGIH: 1 mg/m3 TWA (respirable fraction)
OSHA: 15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
NIOSH: 10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable dust)

Copper (7440-50-8)

ACGIH: 0.2 mg/m3 TWA (fume)
OSHA: 0.1 mg/m3 TWA (fume); 1 mg/m3 TWA (dust and mist)
NIOSH: 1 mg/m3 TWA (dust and mist); 0.1 mg/m3 TWA (fume)

Engineering Measures

None required under normal product use conditions. Ensure proper ventilation if battery has been damaged.

Personal Protective Equipment: Respiratory

None required under normal product use conditions. Use NIOSH approved respiratory protection when handling damaged batteries.

Personal Protective Equipment: Hands

None required under normal product use conditions. Wear protective gloves when handling damaged batteries.

Personal Protective Equipment: Eyes

None required under normal product use conditions. Wear safety glasses when handling damaged batteries.

Personal Protective Equipment: Skin and Body

Wear suitable protective clothing for work situation. A chemical suit may be needed when large quantities of batteries are damaged.

* * * Section 9 - Physical & Chemical Properties * * *

Appearance:	Manufactured Battery Cell	**Odor:**	None
Physical State:	Solid	**pH:**	Not Applicable
Vapor Pressure:	Not Applicable	**Vapor Density:**	Not Applicable
Boiling Point:	Not Applicable	**Melting Point:**	Not Applicable
Solubility (H2O):	Insoluble	**Specific Gravity:**	Not Determined
Evaporation Rate:	Not Applicable	**VOC:**	Not Applicable
Octanol/H2O Coeff.:	Not Determined	**Flash Point:**	Not Applicable
Flash Point Method:	Not Applicable	**Upper Flammability Limit (UFL):**	Not Applicable
Lower Flammability Limit (LFL):	Not Applicable	**Burning Rate:**	Not Applicable
Auto Ignition:	Not Applicable		

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability

This is a stable material.

Hazardous Reaction Potential

Will not occur.

Conditions to Avoid

Keep away from open flames, hot surfaces and sources of ignition. Do not puncture, crush or incinerate.

Incompatible Products

None

Hazardous Decomposition Products

Damaged batteries may release hydrofluoric acid and carbon monoxide.

* * * Section 11 - Toxicological Information * * *

Acute Toxicity

Component Analysis - LD50/LC50

Cobalt(II) oxide (1307-96-6)
Oral LD50 Rat 202 mg/kg

Manganese dioxide (1313-13-9)
Oral LD50 Rat 9000 mg/kg

Nickel oxide (1313-99-1)
Oral LD50 Rat >5000 mg/kg

Carbon (7440-44-0)
Oral LD50 Rat >10000 mg/kg

Ethylene carbonate (96-49-1)
Oral LD50 Rat 10 g/kg; Dermal LD50 Rabbit >3 g/kg

Dimethyl carbonate (616-38-6)
Inhalation LC50 Rat 140 mg/L 4 h; Oral LD50 Rat 13000 mg/kg; Dermal LD50 Rat >2500 mg/kg; Dermal LD50 Rabbit >5 g/kg

Potential Health Effects: Skin Corrosion Property/Stimulativeness

Exposure to a damaged battery can cause severe skin burns.

Potential Health Effects: Eye Critical Damage/ Stimulativeness

Exposure to a damaged battery can cause severe eye damage.

Potential Health Effects: Ingestion

Exposure to a damaged battery can gastrointestinal harm.

Potential Health Effects: Inhalation

Fumes released from a damaged battery may be toxic if inhaled.

Respiratory Organs Sensitization/Skin Sensitization

This product is not reported to have any sensitization effects.

Generative Cell Mutagenicity

This product is not reported to have any mutagenic effects.

Carcinogenicity

A: General Product Information

Exposure to components present in a damaged battery may cause cancer.

B: Component Carcinogenicity

Cobalt(II) oxide (1307-96-6)
IARC: Monograph 52 [1991] (listed under Cobalt and Cobalt compounds) (Group 2B (possibly carcinogenic to humans))

Nickel oxide (1313-99-1)
IARC: Monograph 49 [1990] (listed under Nickel and nickel compounds) (Group 1 (carcinogenic to humans))

Aluminum (7429-90-5)
ACGIH: A4 - Not Classifiable as a Human Carcinogen

Reproductive Toxicity

This product is not reported to have any reproductive toxicity effects.

Specified Target Organ General Toxicity: Single Exposure

This product is not reported to have any single exposure specific target organ toxicity effects.

Specified Target Organ General Toxicity: Repeated Exposure

Exposure to components in a damaged battery causes damage to organs (kidneys, liver, nervous system) through prolonged or repeated exposure.

Aspiration Respiratory Organs Hazard

This product is not reported to have any aspiration hazard effects.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

The product as manufactured is not reported to have any ecotoxicity effects. Damaged batteries may cause ecotoxicity effects.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Nickel oxide (1313-99-1)

Test & Species		Conditions
96 Hr LC50 Brachydanio rerio	>100 mg/L [static]	
72 Hr EC50 Pseudokirchneriella subcapitata	>127.3 mg/L	
48 Hr EC50 Daphnia magna	>100 mg/L	

Copper (7440-50-8)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	0.0068 - 0.0156 mg/L	
96 Hr LC50 Pimephales promelas	<0.3 mg/L [static]	
96 Hr LC50 Pimephales promelas	0.2 mg/L [flow-through]	
96 Hr LC50 Oncorhynchus mykiss	0.052 mg/L [flow-through]	
96 Hr LC50 Lepomis macrochirus	1.25 mg/L [static]	
96 Hr LC50 Cyprinus carpio	0.3 mg/L [semi-static]	
96 Hr LC50 Cyprinus carpio	0.8 mg/L [static]	
96 Hr LC50 Poecilia reticulata	0.112 mg/L [flow-through]	
72 Hr EC50 Pseudokirchneriella subcapitata	0.0426 - 0.0535 mg/L [static]	
96 Hr EC50 Pseudokirchneriella subcapitata	0.031 - 0.054 mg/L [static]	
48 Hr EC50 Daphnia magna	0.03 mg/L [Static]	

Persistence/Degradability

No information available for the product.

Bioaccumulation

No information available for the product.

Mobility in Soil

No information available for the product.

* * * Section 13 - Disposal Considerations * * *

Waste Disposal Instructions

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

Disposal of Contaminated Containers or Packaging

Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 14 - Transportation Information * * *

The rechargeable Lithium-Ion battery packs are made in compliance to the requirements stated in the latest edition of the IATA Dangerous Goods Regulations Packing Instruction 965 section II, such that they can be transported as NOT RESTRICTED (non-hazardous/non-dangerous) goods. However, if those lithium-ion battery packs are packed with or contained in equipment, then it is the responsibility of the shipper to ensure that the consignment is packed in compliance to the latest edition of the IATA Dangerous Goods Regulations section II of either Packing Instruction 966 or 967 in order for that consignment to be declared as NOT RESTRICTED (non-hazardous/non-dangerous).

With regard to transport, the following regulations are cited and considered:

- The International Civil Aviation Organization (ICAO) Technical Instructions (2013-2014 Edition),
- The International Air Transport Association (IATA) Dangerous Goods Regulations (55th Edition, 2014)
- The International Maritime Dangerous Goods (IMDG) Code (2012 Edition),
- US Hazardous Materials Regulations 49 CFR(Code of Federal Regulations) Sections 173-185 Lithium batteries and cells,
- The UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria 38.3 Lithium batteries, 5th revised edition
- UN No. 3480

Our products are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation according to all the applicable international and national governmental regulations, not limited to the above mentioned. We further certify that the enclosed products have been tested and fulfilled the requirements and conditions in accordance with UN Recommendations (T1 – T8) on the Transport of Dangerous Goods Model Regulations and the Manual of Testes and Criteria that can be treated as “Non-Dangerous Goods”.

Test results of the UN Recommendation of the Transport of Dangerous Goods

Manual of Test and Criteria (38.3 Lithium battery)		**Test Results**	**Remark**
No.	Test Item		
T1	Altitude Simulation	Pass	
T2	Thermal Test	Pass	
T3	Vibration	Pass	
T4	Shock	Pass	
T5	External Short Circuit	Pass	
T6	Impact	Pass	
T7	Overcharge	Pass	For pack only
T8	Forced Discharge	Pass	For cell only

* * * Section 15 - Regulatory Information * * *

Regulatory Information

US Federal Regulations

A: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Aluminum (7429-90-5)

SARA 313: 1.0 % de minimis concentration (dust or fume only)

Copper (7440-50-8)

SARA 313: 1.0 % de minimis concentration

CERCLA: 5000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm); 2270 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm)

B: Component Marine Pollutants

This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

Component	CAS #	
Copper	7440-50-8	DOT regulated severe marine pollutant (powder)

State Regulations

Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Nickel oxide	1313-99-1	No	Yes	No	Yes	Yes	No
Aluminum	7429-90-5	Yes	Yes	Yes	Yes	Yes	No
Copper	7440-50-8	Yes	Yes	Yes	Yes	Yes	No
Ethylene carbonate	96-49-1	No	Yes	No	No	Yes	No
Dimethyl carbonate	616-38-6	No	Yes	No	Yes	Yes	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Cobalt(II) oxide	1307-96-6	1 %
Nickel oxide	1313-99-1	0.1 %
Aluminum	7429-90-5	1 %
Copper	7440-50-8	1 %

Additional Regulatory Information

Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Cobalt(II) oxide	1307-96-6	Yes	DSL	EINECS
Manganese dioxide	1313-13-9	Yes	DSL	EINECS
Nickel oxide	1313-99-1	Yes	DSL	EINECS
Carbon	7440-44-0	Yes	DSL	EINECS
Polyvinylidene fluoride (PVdF)	24937-79-9	Yes	DSL	No
Aluminum	7429-90-5	Yes	DSL	EINECS
Copper	7440-50-8	Yes	DSL	EINECS
Carbonate, methyl ethyl	623-53-0	Yes	NDSL	No
Ethylene carbonate	96-49-1	Yes	DSL	EINECS
Phosphate(1-), hexafluoro-, lithium	21324-40-3	Yes	NDSL	EINECS
Dimethyl carbonate	616-38-6	Yes	DSL	EINECS

* * * Section 16 - Other Information * * *

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration., NJTSR = New Jersey Trade Secret Registry.

Literature References

None

Other Information

Note: This information is furnished without warranty, representation, inducement or license of any kind, except that it is accurate to the best of Ingersoll-Rand's knowledge or obtained from sources believed by Ingersoll-Rand to be accurate, and Ingersoll-Rand does not assume any legal responsibility for use or reliance upon same. Customers are encouraged to conduct their own tests. Before using any product, READ THE LABEL AND PRODUCT LITERATURE.

Distributor Contact Information:

Ingersoll Rand Company
800-D Beaty Street
Davidson, NC 28036
USA

www.irco.com

Ingersoll Rand Company Limited
Swan Lane
Hindley Green, Nr Wigan
WN2 1XB

www.irco.com

Ingersoll Rand SEA (pte), Limited
Jurong Town
PO Box 88
Singapore 916103

www.irco.com

End of Sheet