SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

1.1. Product Identifier
Product Name: Lithium-Ion Rechargeable Battery Pack
Product Code: BL192, BL144, BL072
Watt Hour rating (for battery pack): 44Wh (BL192), 35Wh (BL144), 18Wh (BL072)
Rated Capacity: 2.4Ah (BL192), 2.4Ah (BL144), 2.4Ah (BL072)
Average Operating Voltage: 19.2V(BL192), 14.4V(BL144), 7.2V(BL072)

1.2. Intended Use of the Product
Use of the Substance/Mixture: Lithium-Ion battery pack

1.3. Name, Address, and Telephone of the Responsible Party
Company
Ingersoll Rand Company
Industrial Technologies
Davidson, NC 28036
T 1-800-866-5457 (Product Support)

1.4. Emergency Telephone Number
Emergency Number : 1-800-424-9300 CHEMTREC

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture
Classification (GHS-US)
Within the meaning of the OSHA Hazard Communication Standard [29 CFR 1910.1200]: this mixture is not considered a hazard when used in a manner which is consistent with the labeled directions. See section 2.3 for information for hazards related to the ingredients encased within this product.

2.2. Label Elements
GHS-US Labeling
No labeling is applicable since this product is considered an article under the OSHA Hazard communication Standard [29 CFR 1910.1200]. See section 2.3 for hazards related to the ingredients encased within this product.

*2.3. Other Hazards
Other hazards not contributing to the classification (These represent the hazards associated with the materials encased within the product that are not available under normal conditions of use)
May form combustible dust concentrations in air
H317 - May cause an allergic skin reaction
H351 - Suspected of causing cancer

Other Hazards Not Contributing to the Classification: Within the meaning of the OSHA Hazard Communication Standard [29 CFR 1910.1200]: this mixture is not considered a hazard when used in a manner which is consistent with the labeled directions. This mixture is considered an article in its final form. This MSDS covers the hazards and information of the materials contained within the article, in the event the product is damaged or mishandled. Under normal conditions of use these chemicals are not anticipated to be available for exposure. Substances within this product may be reactive with water, air, and flammable if released. Thermal decomposition of this product may generate corrosive, and toxic vapors. In particular Hydrofluoric acid may be released in the case of open cells. Hydrofluoric acid can cause severe chemical burns, is toxic by all routes of exposure, and is very reactive. Avoid extremely high or low temperatures, keep away from incompatible materials. Do not puncture, damage, or incinerate container.

2.4. Unknown Acute Toxicity (GHS-US)
No data available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substance
Not applicable

3.2. Mixture**

<table>
<thead>
<tr>
<th>Name</th>
<th>Product Identifier</th>
<th>%</th>
<th>Classification (GHS-US)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lithium Nickel Cobalt Oxides</td>
<td>Not available</td>
<td>10 - 20</td>
<td>Not classified</td>
</tr>
<tr>
<td>Graphite</td>
<td>(CAS No) 7782-42-5</td>
<td>10 - 20</td>
<td>Comb. Dust, H232</td>
</tr>
</tbody>
</table>
Lithium-Ion Rechargeable Battery Pack
Safety Data Sheet
according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

**These composition tables represent the hazards associated with the individual ingredients within this product. The product itself is not hazardous under normal conditions of use.**

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of First Aid Measures

First-aid Measures General: The following first aid measures apply in case of exposure to the interior battery components, if the battery is damaged and exposure occurs. Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

First-aid Measures After Inhalation: When symptoms occur: go into open air and ventilate suspected area. Immediately call a POISON CENTER or doctor/physician.

First-aid Measures After Skin Contact: Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Immediately call a POISON CENTER or doctor/physician.

First-aid Measures After Eye Contact: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.

First-aid Measures After Ingestion: Rinse mouth. Obtain emergency medical attention. IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/Injuries: Not hazardous according to OSHA 29 CFR 1910.1200 and is considered an article. Under normal conditions of use there are no physical or health hazards associated with this product. The following symptoms apply in the event an exposure occurs to the materials housed inside the product. Contact may cause immediate severe irritation progressing quickly to chemical burns. May cause cancer. Exposure may produce an allergic reaction.

Symptoms/Injuries After Inhalation: Exposure to materials housed in battery. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Inhalation may cause immediate severe irritation progressing quickly to chemical burns.

Symptoms/Injuries After Skin Contact: May cause an allergic skin reaction.

Symptoms/Injuries After Eye Contact: Causes serious eye damage.

Symptoms/Injuries After Ingestion: Ingestion is likely to have harmful or adverse effects.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed to materials encased within the product get medical attention immediately.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing Media


Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

5.2. Special Hazards Arising From the Substance or Mixture

Fire Hazard: Not considered flammable but will burn at high temperatures. If heated above 100°C (212°F) can cause ignition.

Explosion Hazard: If heated above heated at high temperatures cells can explode.

Reactivity: Thermal decomposition generates: Corrosive vapors. Flammable gas. Toxic Gas. Hydrofluoric Acid. Product itself is stable, but if damaged or opened. Can also release hydrofluoric acid on contact with water which can cause severe chemical burns, is toxic by all routes of exposure, and is very reactive.

5.3. Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Use water spray or fog for cooling exposed containers. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Other information: Do not allow run-off from fire fighting to enter drains or water courses. Upon thermal decomposition and high temperatures may explode, or release toxic, corrosive, and flammable gases.
**SECTION 6: ACCIDENTAL RELEASE MEASURES**

6.1. **Personal Precautions, Protective Equipment and Emergency Procedures**

**General Measures:** Product itself under normal conditions of use is not considered hazardous, for materials housed within product. Avoid all eyes and skin contact and do not breathe vapor and mist. Do not allow product to spread into the environment.

6.1.1. **For Non-emergency Personnel**

**Protective Equipment:** Use appropriate personal protection equipment (PPE).

**Emergency Procedures:** Evacuate unnecessary personnel.

6.1.2. **For Emergency Responders**

**Protective Equipment:** Equip cleanup crew with proper protection.

**Emergency Procedures:** Ventilate area.

6.2. **Environmental Precautions**

Prevent entry to sewers and public waters. Avoid release to the environment.

6.3. **Methods and Material for Containment and Cleaning Up**

**For Containment:** Stop leak without risks if possible.

**Methods for Cleaning Up:** Clear up spills immediately and dispose of waste safely. For product itself take up mechanically, for inner materials in the event of release from damage neutralize, and absorb material with inert material. Stop leak if possible to do so without risk. Do not allow to spread into the environment. Contact competent authority after a spill, and follow local/national regulations.

6.4. **Reference to Other Sections**

See heading 8, Exposure Controls and Personal Protection.

**SECTION 7: HANDLING AND STORAGE**

7.1. **Precautions for Safe Handling**

**Additional Hazards When Processed:** Do not open or damage enclosure, or battery cell as this could cause a potential exposure and release of hazardous materials. Under normal conditions of use this product is considered an article and exposure to the ingredients contained within this product is unlikely. Substances within this product may be reactive with water, air, and flammable if released. Thermal decomposition of this product may generate corrosive, and toxic vapors. In particular Hydrofluoric acid may be released in the case of open cells. Hydrofluoric acid can cause severe chemical burns, is toxic by all routes of exposure, and is very reactive. Avoid extremely high or low temperatures, keep away from incompatible materials. Do not expose to heat, or ignition sources as this could cause an explosion. If heated at high temperatures may explode. Do not puncture or incinerate container. Avoid short circuiting the cell.

**Precautions for Safe Handling:** Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust, gas, spray from inner battery components.

**Hygiene Measures:** Handle in accordance with good industrial hygiene and safety procedures. Wash contaminated clothing before reuse. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work. Do no eat, drink or smoke when using this product.

7.2. **Conditions for Safe Storage, Including Any Incompatibilities**

**Technical Measures:** Comply with applicable regulations.

**Storage Conditions:** Keep container tightly closed. Store in original container. Store in a dry, cool place. Store away from ignition sources, heat, and incompatible materials.

**Incompatible Products:** Strong acids. Strong bases. Strong oxidizers.

**Storage Temperature:** -20°C to 45 °C (-4°F to 113°F)

7.3. **Specific End Use(s)**

Lithium-Ion battery pack.

**SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**

8.1. **Control Parameters**

<table>
<thead>
<tr>
<th>Substance</th>
<th>USA ACGIH</th>
<th>USA NIOSH</th>
<th>USA IDLH</th>
<th>USA OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graphite</td>
<td>ACGIH TWA (mg/m³)</td>
<td>NIOSH REL (TWA) (mg/m³)</td>
<td>US IDLH (mg/m³)</td>
<td>OSHA PEL (TWA) (mg/m³)</td>
</tr>
<tr>
<td></td>
<td>2 mg/m³ (all forms except graphite fibers)</td>
<td>2.5 mg/m³ (natural)</td>
<td>1250 mg/m³ (synthetic)</td>
<td>5 mg/m³ (synthetic)</td>
</tr>
<tr>
<td>Carbon black</td>
<td>ACGIH TWA (mg/m³)</td>
<td>3 mg/m³</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Lithium-Ion Rechargeable Battery Pack
Safety Data Sheet
according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

<table>
<thead>
<tr>
<th>USA NIOSH</th>
<th>NIOSH REL (TWA) (mg/m³)</th>
<th>0.1 mg/m³ (Carbon black in presence of Polycyclic aromatic hydrocarbons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA IDLH</td>
<td>US IDLH (mg/m³)</td>
<td>1750 mg/m³</td>
</tr>
<tr>
<td>USA OSHA</td>
<td>OSHA PEL (TWA) (mg/m³)</td>
<td>3.5 mg/m³</td>
</tr>
</tbody>
</table>

8.2. Exposure Controls

Appropriate Engineering Controls: Ensure all national/local regulations are observed.

Personal Protective Equipment:
- Not required under normal conditions of use, when handling damaged batteries: Gloves. Protective clothing. Protective goggles. Insufficient ventilation: wear respiratory protection.

Materials for Protective Clothing:
- Not required under normal conditions of use, when handling damaged batteries: Chemically resistant materials and fabrics. Corrosionproof clothing.

Hand Protection:
- Not required under normal conditions of use, when handling damaged batteries: Wear chemically resistant protective gloves.

Eye Protection:
- Not required under normal conditions of use, when handling damaged batteries: Chemical goggles or safety glasses.

Skin and Body Protection:
- Not required under normal conditions of use, when handling damaged batteries: Wear suitable protective clothing.

Respiratory Protection:
- Not required under normal conditions of use, when handling damaged batteries: Use a NIOSH-approved self-contained breathing apparatus whenever exposure may exceed established Occupational Exposure Limits.

Other Information:
- When using, do not eat, drink or smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on Basic Physical and Chemical Properties

- Physical State: Solid
- Appearance: Lithium ion rechargeable cells set in a resin case
- Odor: No data available
- Odor Threshold: No data available
- pH: No data available
- Relative Evaporation Rate (butylacetate=1): No data available
- Melting Point: No data available
- Freezing Point: No data available
- Boiling Point: No data available
- Flash Point: No data available
- Auto-ignition Temperature: No data available
- Decomposition Temperature: No data available
- Flammability (solid, gas): No data available
- Vapor Pressure: No data available
- Relative Vapor Density at 20 °C: No data available
- Relative Density: No data available
- Specific Gravity: No data available
- Solubility: No data available
- Log Pow: No data available
- Log Kow: No data available
- Viscosity, Kinematic: No data available
- Viscosity, Dynamic: No data available
- Explosive Properties: No data available
- Oxidizing Properties: No data available

12/20/2013
EN (English US)
Explosive Limits: Not applicable
Watt Hour rating (for battery pack): 18Wh, 35Wh, 44Wh
Rated Capacity: 2.4Ah (18Wh), 2.4Ah (35Wh), 2400mAh (44Wh)
Average Operating Voltage: 7.2V, 14.4V, 19.2V

9.2. Other Information: No additional information available

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity: Thermal decomposition generates: Corrosive vapors. Flammable gas. Toxic Gas. Hydrofluoric Acid. Product itself is stable, but if damaged or opened can release hydrofluoric acid on contact with water which can cause severe chemical burns, is toxic by all routes of exposure, and is very reactive.

10.2 Chemical Stability: Stable under normal conditions.

10.3 Possibility of Hazardous Reactions: Hazardous reactions will not occur under normal conditions.

10.4 Conditions to Avoid: Direct sunlight. Extremely high or low temperatures. Ignition sources. Incompatible materials. Damaging, puncturing, or opening the battery cell. Do not connect positive terminal to negative terminal with electrical wire or chain. Do not use unauthorized charger or charging method. Do not deconstruct or disassemble battery or solder battery.


10.6 Hazardous Decomposition Products: Thermal decomposition generates: Carbon oxides (CO, CO2). Corrosive vapors. Toxic vapors. Can also release hydrofluoric acid on contact with water which can cause severe chemical burns, is toxic by all routes of exposure, and is very reactive. Lithium oxides. Manganese oxides.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information On Toxicological Effects
This product is considered an article under the OSHA Hazard communication Standard [29 CFR 1910.1200]. The information below reflects the hazards of the individual ingredients within the product, which if damaged may be released.

Acute Toxicity: Not classified
Skin Corrosion/Irritation: Not classified
pH: No data available
Serious Eye Damage/Irritation: Not classified
pH: No data available
Respiratory or Skin Sensitization: Not classified
Germ Cell Mutagenicity: Not classified
Carcinogenicity: Suspected of causing cancer.

<table>
<thead>
<tr>
<th>Carbon black (1333-86-4)</th>
<th>IARC group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2B</td>
</tr>
</tbody>
</table>

Reproductive Toxicity: Not classified
Specific Target Organ Toxicity (Single Exposure): Not classified
Specific Target Organ Toxicity (Repeated Exposure): Not classified
Aspiration Hazard: Not classified
Symptoms/Injuries After Inhalation: Exposure to materials housed in battery. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Inhalation may cause immediate severe irritation progressing quickly to chemical burns.
Symptoms/Injuries After Skin Contact: Exposure to materials housed in battery: May cause an allergic skin reaction.
Symptoms/Injuries After Eye Contact: Exposure to materials housed in battery: Causes serious eye damage.
Symptoms/Injuries After Ingestion: Exposure to materials housed in battery: Ingestion is likely to have harmful or adverse effects

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity
Ecology - General: The product itself is not considered hazardous and is considered an article according to 29 CFR 1910.1200. The ecotoxicological information applies to the materials encased within the product.

<table>
<thead>
<tr>
<th>Carbon black (1333-86-4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50 Fish 1</td>
</tr>
<tr>
<td>EC50 Daphnia 1</td>
</tr>
</tbody>
</table>
12.2. Persistence and Degradability
No data available

12.3. Bioaccumulative Potential

<table>
<thead>
<tr>
<th>Lithium-Ion Rechargeable Battery Pack</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Log Pow</td>
<td>No data available</td>
</tr>
<tr>
<td>Bioaccumulative Potential</td>
<td>Not established.</td>
</tr>
</tbody>
</table>

12.4. Mobility in Soil
No additional information available

12.5. Other Adverse Effects
Other Information
Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods
Waste Treatment Methods: Dispose of waste material in accordance with all local, regional, national, and international regulations. Do not puncture or incinerate container.

SECTION 14: TRANSPORT INFORMATION

Avoid high temperature and dew condensation when transporting. Avoid transportation which may cause damage of package. Handle containers carefully.

14.1. UN number
UN-No*: 3480 or 3481

14.2. UN proper shipping name
Proper Shipping Name*: LITHIUM ION BATTERIES, LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT

14.3. Transport hazard class(es)
Class (UN)*: 9
Hazard labels (UN)*: 9

14.4. Packing group
Packing group (UN)*: IB (UN3480 only) or II
Additional information: *Under certain conditions dependent on region and transport mode may be transported not as dangerous goods in accordance with specific instructions and provisions. Other identification numbers may apply under certain conditions by mode of transport and region. Follow applicable regulations (not limited to but including):
IATA-DGR – Packing instruction 965, 966, 967
IMO-IMDG – Packing instruction P903, Special provision 188
DOT 49 CFR – 173.185, Special provisions 188 and 189

Watt Hour rating (for battery pack): 44Wh (BL192), 35Wh (BL144), 18Wh (BL072)
Rated Capacity: 2.4Ah (BL192), 2.4Ah (BL144), 2.4Ah (BL072)
Average Operating Voltage: 19.2V(BL192), 14.4V(BL144), 7.2V(BL072)

SECTION 15: REGULATORY INFORMATION

15.1 US Federal Regulations
This product is considered an article under the OSHA Hazard communication Standard [29 CFR 1910.1200]. The information below reflects the hazards of the individual ingredients within the product, which if damaged may be released.

<table>
<thead>
<tr>
<th>Lithium manganese oxide (LiMn2O4) (12057-17-9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EPA TSCA Regulatory Flag</th>
</tr>
</thead>
<tbody>
<tr>
<td>S - S - indicates a substance that is identified in a proposed or final Significant New Uses Rule.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Graphite (7782-42-5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Carbon black (1333-86-4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
</tr>
</tbody>
</table>
1.1-Difluoroethylene polymer (24937-79-9)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2 US State Regulations
This product is considered an article under the OSHA Hazard communication Standard [29 CFR 1910.1200]. The information below reflects the hazards of the individual ingredients within the product, which if damaged may be released

<table>
<thead>
<tr>
<th>Carbon black (1333-86-4)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WARNING:</strong> This product contains chemicals known to the State of California to cause cancer.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Graphite (7782-42-5)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WARNING:</strong> This product contains chemicals known to the State of California to cause cancer.</td>
</tr>
</tbody>
</table>

**Carbon black** (1333-86-4)

<table>
<thead>
<tr>
<th>U.S. - California - Proposition 65 - Carcinogens List</th>
</tr>
</thead>
<tbody>
<tr>
<td>WARNING: This product contains chemicals known to the State of California to cause cancer.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>U.S. - California - Toxic Air Contaminant List (AB 1807, AB 2728)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WARNING: This product contains chemicals known to the State of California to cause cancer.</td>
</tr>
</tbody>
</table>

12/20/2013 EN (English US)
**SECTION 16: OTHER INFORMATION**

**Revision date**: 12/20/2013

**Other Information**: This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200. Within the meaning of the OSHA Hazard Communication Standard [29 CFR 1910.1200]: this mixture is not considered a hazard when used in a manner which is consistent with the labeled directions. This mixture is considered an article in its final form.

GHS Full Text Phrases:

GHS Full Text Phrases (This product is considered an article under the OSHA Hazard communication Standard [29 CFR 1910.1200]. The information below reflects the hazard descriptions for the hazards of the individual ingredients within the product, which if damaged may be released)

<table>
<thead>
<tr>
<th>Carc. 2</th>
<th>Carcinogenicity Category 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comb. Dust</td>
<td>Combustible Dust</td>
</tr>
<tr>
<td>H232</td>
<td>May form combustible dust concentrations in air</td>
</tr>
<tr>
<td>H351</td>
<td>Suspected of causing cancer</td>
</tr>
</tbody>
</table>

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

SDS US (GHS HazCom) - US