SECTION 1 - PRODUCT IDENTIFICATION

- **Product Identification**
  - Polymer Lithium-Ion Rechargeable Battery
  - Nominal Voltage: 3.7V
  - Nominal Cell Capacity: 4050mAh
  - Cell P/N: PP065794AB

- **Manufacture Identification**
  - Tianjin Lishen Battery Joint-Stock Co. Ltd.
  - 86-22-83710366
  - 6 Lanyuan Road, Huayuan Hi-Tech Industry Park, Tianjin 300384, China

NOTE: Blank spaces are not permitted. If any item is not applicable or no information is available, the space must be marked to indicate that.

SECTION 2 - HAZARDS IDENTIFICATION

- **Primary Routes of Entry**
  - Inhalation
  - Ingestion
  - Skin Absorption
  - Eye Contact

- **Chemical Names**
  - Lithium Carbonate
  - Graphite Carbon
  - Lithium Hexafluorophosphate
  - Organic solvent

- **Total Equivalent Lithium content per cell**
  - 1.215g

- **Components - Chemical Name and Common Names**
  - Lithium Carbonate: 61%
  - Graphite Carbon: 21%
  - Lithium Hexafluorophosphate: 4%
  - Organic Solvent: 14%
  - Non-Hazardous Ingredients (tabs, pouch, separator etc.): 24%

- **Total**: 125%

SECTION 4 - FIRST-AID MEASURES

In case of fire in cell original containers, use CO2 or dry chemical extinguisher; For fire in an adjacent area, water can be used.

- **Eye Contact**
  - In case of eye contact, flush with lots of water for 15 minutes, and get medical help.

- **Skin Contact**
  - In case of skin contact with contents of battery, flush immediately with water.

- **Inhalation**
  - In case of light inhalation, move to an area with fresh air immediately, if irritation persists, get medical help.

- **Ingestion**
  - In case of ingestion, drink milk/water to induce vomiting and wash out, get medical help.

SECTION 5 - FIREFIGHTING MEASURES

Extinguisher Media:
- CO2 or dry chemical power

Special Fire-Fighting Procedures:
- In case of fire in cell original containers, use CO2 or dry chemical extinguisher; For fire in an adjacent area, water can be used.
# MATERIAL SAFETY DATA SHEET

**Revision:** 3  **Issue Date:** 2008-06-23

## SECTION 7  HANDLING AND STORAGE

### Handling:
- See all precautions mentioned in this document and operate the battery within the temperature range of -20°C and 45°C.
- No special protective clothing required for handling individual cells in corrective operational method. Improper handling of lithium ion battery may result in injury or damage from electrolyte leakage, heating, ignition or explosion. Do not crush, pierce, short cell/battery terminals with conductive material; do not directly heat or solder; do not throw into fire; do not place cell/battery in non-ventilated area or container.

### Storage:
- Store the battery in a cool, drying place, without chemical vapor or excessive humidity.

## SECTION 8  EXPOSURE CONTROLS & PERSONAL PROTECTION

### Engineering Controls:
- Keep away from heat and open flame, prevent hard & sharp thing penetration, store in a cool & dry place.

### Personal Protection:
- Respiratory Protection: Not necessary under normal operations condition. SCBA required in the event of a fire.
- Eye/face Protection: Not necessary under normal operation condition.
- Foot Protection: Steel toed shoes recommended for large container handling.

### Ventilation to Be Used
- Local Exhaust: Not necessary under conditions of normal use.
- Mechanical (General): Not necessary under conditions of normal use.
- Other (Specify): Not necessary under normal operation conditions.

### Other Protective Clothing and Equipment
- Not necessary under normal operation conditions.

### Hygienic Work Practices
- Not necessary under normal operation conditions.

## SECTION 9  PHYSICAL /CHEMICAL PROPERTIES

### Specific Gravity (H2O=1):
- LiCoO₂: 3.80
- Graphite: 2.0-2.2

### Melting Point:
- LiCoO₂: 1130°C
- Graphite: 2.0~2.2
- Graphite: 3500-3900°C

### Appearance and Odor:
- LiCoO₂ is a gray odorless power; Graphite is a black or odorless power; Organic solvent is a colorless liquid; Lithium salt is a white, crystalline and odorless power.

## SECTION 10  STABILITY & REACTIVITY DATA

### Stability
- Stable
- Unstable

### Conditions to Avoid:
- Do not heat or incinerate the battery. Never impact, pierce or crush the battery.
- Do not disassemble or modify the battery.
- Do not charge the battery under high temperature conditions such as near a fire or in the direct sunlight.
- Do not short-circuit the battery by connect the positive and negative terminals with a metal material.
- Do not allow the battery to get wet or be immersed in water.

### Incompatibility (Materials to Avoid)
- Water, salted water, other solvent with water

### Hazardous Decomposition Products
- N/A

### Hazardous Polymerization
- May Occur
- Will Not Occur

### Conditions to Avoid

## SECTION 11  TOXICOLOGICAL INFORMATION

This product does not elicit toxicological properties during routine handling and use.

## SECTION 12  ECOLOGICAL INFORMATION

- Cobalt and its compounds can pose a threat if released to environment. The detail information are shown in waste disposal method in Section 13 “Disposal Consideration”.
SECTION 13 DISPOSAL CONSIDERATIONS

There is no contamination during normal operation and use. Lithium batteries should have their terminals insulated prior to disposal, do not throw away a used battery and provide them for recycling company.

Open cells should be treated as hazardous waste, if the leakage or other material is Released, we should take actions as follows:

- Leave the area, allow the batteries to cool down, let the vapors to dissipate.
- Avoid skin and eye contact or inhalation of vapors. Remove spiller liquid with absorbent and incinerate after.
- Incineration: incineration should never be performed by battery users but eventually by trained professionals in authorized facilities with proper gas and fumes treatment.
- Landfilling: According to the proper laws and regulations in different countries or areas, the battery should be buried deeply in the specified place.
- Recycling: Send to authorized recycling facilities to get Co, Cu and Al, eventually through licensed waste carrier.

Waste Disposal method: Opened cells should be treated as hazardous waste.

- Only for battery

SECTION 14 Transportation

Lishen’s DAP54880PA Lithium-Ion Polymer batteries are considered to be "Rechargeable Lithium Ion Polymer Batteries" and meet the requirements of transportation by the United States Department of Transportation (DOT), International Civil Aviation Administration (ICAO), International Air Transportation Association (IATA) special provision UN3480 as "non-dangerous goods" or "non-hazardous materials". These lithium batteries can be transported in non-restrictive material and as Non-Dangerous Goods as they meet all the requirements in below:

- Lithium content requirement
  - For the bar cells, the lithium content can not overpass 20Wt/h;
  - For the batteries, the lithium content can not overpass 100Wt/h;
- Meet with UN Test Requirement
  - All the cell and battery must be verified to meet with all the requirements in Part 3 -38.3 Item (UN38.3 tests) for "Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria".

- Package Requirement
  - The cell and battery must be packaged specially and singly, and put into hard outer package to prevent short-circuit if they do not be assembled in finished equipments (such as mobile phone, camera, NBPC, and so on).
  - The cell quantity is more than 24pcs or the battery quantity is more than 12pcs, they must be asked to meet with the requirements in blow besides they are assembled in finished equipment.
  - Every package must be marked in the content that the packages are loaded in lithium cells or batteries, also add new lithium iron operation label, also need point out the corrective actions when the packages are damaged.
  - Every batch shipment must be appended document which should contain the content that the packages are loaded in lithium cells or batteries, also need point out the corrective actions when the packages are damaged.
  - Every package must pass 1.2mm fall test in any direction. No damage for the cells and batteries, no move and touch together, no cells or batteries escape from the package.
  - Every package weight can not overpass 10kg if the batteries can not be assembled in finished equipment.

SECTION 15 REGULATORY INFORMATION


| Hazardous | Non-hazardous |

SECTION 16 OTHER INFORMATION

There is no hazards in accordance with the UN recommendations text,(UN manual of tested and criteria 38.3)

<table>
<thead>
<tr>
<th>Test No</th>
<th>Test Item</th>
<th>Criteria</th>
<th>Result</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>38.3.4.1</td>
<td>Altitude Test</td>
<td>No mass loss, leakage, disassembly, rupture, and fire. OCV should not be less than 90% before testing</td>
<td>Passed</td>
<td></td>
</tr>
<tr>
<td>38.3.4.2</td>
<td>Thermal Test</td>
<td>No mass loss, leakage, disassembly, rupture, and fire. OCV should not be less than 90% before testing</td>
<td>Passed</td>
<td></td>
</tr>
<tr>
<td>38.3.4.3</td>
<td>Vibration</td>
<td>No mass loss, leakage, disassembly, rupture, and fire. OCV should not be less than 90% before testing</td>
<td>Passed</td>
<td></td>
</tr>
<tr>
<td>38.3.4.4</td>
<td>Shock</td>
<td>No mass loss, leakage, disassembly, rupture, and fire. OCV should not be less than 90% before testing</td>
<td>Passed</td>
<td></td>
</tr>
<tr>
<td>38.3.4.5</td>
<td>External Short Circuit</td>
<td>External temperature should not exceed 178degC. No disassembly, and fire within six hours of this test.</td>
<td>Passed</td>
<td></td>
</tr>
<tr>
<td>38.3.4.6</td>
<td>Impact</td>
<td>External temperature should not exceed 178degC. No disassembly, and fire within six hours of this test.</td>
<td>Passed</td>
<td></td>
</tr>
<tr>
<td>38.3.4.7</td>
<td>Overcharge</td>
<td>No disassembly, and fire within seven days of this test.</td>
<td>Passed</td>
<td></td>
</tr>
<tr>
<td>38.3.4.8</td>
<td>Forced Discharge</td>
<td>No disassembly, and fire within seven days of this test.</td>
<td>Passed</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pack Part Number</th>
<th>K-HS-08074PA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Voltage</td>
<td>3.7V</td>
</tr>
<tr>
<td>Nominal Pack Capacity</td>
<td>4050mAh</td>
</tr>
<tr>
<td>Pack Mass</td>
<td>75g</td>
</tr>
<tr>
<td>Equivalent Lithium Content</td>
<td>2.215g</td>
</tr>
</tbody>
</table>