**Product Safety Data Sheet**

**LGC Lithium- Ion Rechargeable Battery Pack**

**LG CHEMICAL LTD**

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**SECTION 1  Product and Company Identification**

**PRODUCT IDENTIFICATION**
HP HSTNN-LB4P, LGC 1P3S Lithium- Ion Battery Pack
Battery pack model: PX03050XL_Prismatic
Name of the manufacture or supplier: LG CHEMICAL LTD
Revision date: May, 24, 2013
Battery pack Electric Power Capacity: 50Wh

**MANUFACTURING/DISTRIBUTOR**
LG Chemical Ltd. Twin Tower Youido-Dong 120, Youngdeungpo-Ku, Seoul, Korea

**PHONE NUMBER**
Tel: + 82-2-3773-3990

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**SECTION 2  Composition and Information on Ingredients**

<table>
<thead>
<tr>
<th>Component</th>
<th>%</th>
<th>CAS Number</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases(PC)</td>
<td>9-11</td>
<td>103598-77-2</td>
<td>No dangerous</td>
</tr>
<tr>
<td>PCB Assembly</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glass cloth</td>
<td>1-2</td>
<td>65997-17-3</td>
<td>No dangerous</td>
</tr>
<tr>
<td>Copper</td>
<td></td>
<td>7440-50-8</td>
<td></td>
</tr>
<tr>
<td>Epoxy</td>
<td></td>
<td>26265-8-7</td>
<td></td>
</tr>
<tr>
<td>2-Butoxy ethyl acetate</td>
<td></td>
<td>112-07-2</td>
<td></td>
</tr>
<tr>
<td>Dipropylene glycol methyl ether</td>
<td></td>
<td>34590-94-8</td>
<td></td>
</tr>
<tr>
<td>Acrylate resins</td>
<td></td>
<td>Various</td>
<td></td>
</tr>
<tr>
<td>Epoxy resin mixture</td>
<td></td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Gamma-Butyrolactone</td>
<td></td>
<td>00000096-48-0</td>
<td></td>
</tr>
<tr>
<td>Other components</td>
<td></td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>
Lithium Ion Cell: LGC ICP666180L1

### Hazardous Ingredients

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>%</th>
<th>CAS Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum Foil</td>
<td>2-10</td>
<td>7429-90-5</td>
</tr>
<tr>
<td>Metal Oxide (proprietary)</td>
<td>20-50</td>
<td></td>
</tr>
<tr>
<td>Polyvinylidene Fluoride (PVDF)</td>
<td>&lt;5</td>
<td>24937-79-9</td>
</tr>
<tr>
<td>Copper Foil</td>
<td>2-10</td>
<td>7440-50-8</td>
</tr>
<tr>
<td>Carbon (proprietary)</td>
<td>10-30</td>
<td>7440-44-0</td>
</tr>
<tr>
<td>Electrolyte (proprietary)</td>
<td>10-20</td>
<td></td>
</tr>
<tr>
<td>Stainless steel, Nickel and inert materials</td>
<td>Remainder</td>
<td>N/A</td>
</tr>
</tbody>
</table>

### Electric Power Capacity:

16.416 Wh

### UN CLASS

1. Even classified as lithium batteries (UN3480), 2013 IATA Dangerous Goods Regulations 54th edition Packing Instruction 965 section II is applied. The product is handled as Non-Dangerous Goods by meeting the following requirements.

   - For 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
   - The Watt-hour rating must be marked on outside of the battery case.
   - Each cell or battery is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria part (subsection 38.3)

2. Even classified as lithium batteries packed with equipment (UN3481), 2013 IATA Dangerous Goods Regulations 54th edition Packing Instruction 966 section II is applied. The product is handled as Non-Dangerous Goods by meeting the following requirements.

   - For cells, the Watt-hour rating is not more than 20Wh
   - For batteries, Watt-hour rating is not more than 100Wh
   - The Watt-hour rating must be marked on outside of the battery case.
   - Each cell or battery is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria part (subsection 38.3)
   - Maximum quantity: Minimum needed for the operation of the equipment, plus 2 spares.
   - This product passed 1.2M drop test and comply with UN38.3.
SECTION 3  Hazards Identification

EMERGENCY OVERVIEW

During a fire, may release irritating gases.
Use extinguishing media suitable for materials burning in fire.

POTENTIAL HEALTH EFFECTS

EYE
No effect under routine handling and use.

SKIN
No effect under routine handling and use. Nothing cause sensitization(allergic reaction)

INHALATION
No effect under routine handling and use.

CHRONIC EFFECTS
None known.

CARCINOGENICITY INFORMATION
The components of this product are not listed by IARC, NTP, OSHA, or ACGH as a carcinogen.

SECTION 4  First Aid Measures

If exposure to internal materials within cell due to damaged outer casing, the following actions are recommended.

EYE CONTACT
In case of eye contact, immediately flush eyes which plenty of water at least 15 minutes. Get medical attention if irritation persists or develops later.

INHALATION
If exposed to excessive levels of DMAc, fiber dust or fly, remove to fresh air. Get medical attention if cough or symptoms develop.

SKIN CONTACT
Wash with soap and water. Get medical attention if irritation develops or persists. Use hand creams to soothe and moisten irritated skin.
INGESTION
Not a probable route. However, in case of gastro intestinal distress following accidental ingestion, call a physician.

SECTION 5  Fire Fighting Measures

FLAMMABLE PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flammable limits in air</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Lower explosive limits</td>
<td>Not established</td>
</tr>
<tr>
<td>Upper explosive limits</td>
<td>Not established</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not available</td>
</tr>
</tbody>
</table>

UNUSUAL FIRE AND EXPLOSION HAZARDS

During a fire, irritating and toxic gases and aerosols may be generated by thermal decomposition and combustion.

EXTINGUISHING MEDIA

Use the following extinguishing media suitable for the materials that are burning.
: Water, Carbon Dioxide, Dry Chemical, Foam

FIRE FIGHTING INSTRUCTIONS

Keep personnel removed and upwind of fire.
Wear self-contained breathing apparatus.
Wear full protective equipment (full Bunker gear)

SECTION 6  Accidental Release Measures

SAFEGUARDS(Personnel)
Review FIRE FIGHTING MEASURES and HANDLING sections before proceeding with cleanup.
Use appropriate personal protective equipment during cleanup.

SPILL CLEANUP
Vacuum or sweep up material for salvage or disposal.
ACCIDENTAL RELEASE MEASURES
Wash, shovel or mop up and place in solid waste containers.
Do not flush to drains.

SECTION 7  Handling and Storage

HANDLING
Use good material handling practice.

STORAGE
Store in a cool, dry place.

SECTION 8  Exposure Controls / Personal Protection

ENGINEERING CONTROLS
Keep away from heat and open flame.
Good general ventilation is recommended. Local exhaust ventilation is recommended where vapors are likely to be released.

PERSONAL PROTECTIVE EQUIPMENT

EYE PROTECTION
Not required beyond safety practices of employer.
But in the event of a fire, safety glasses with side-shields for general protection are recommended.

SKIN PROTECTION
None required normal operations.
If during a fire, wear gloves to prevent skin abrasion and irritation.

RESPIRATOR PROTECTION
Respirator use must be in accordance with OSHA Standard 29 CFR 1910.134
Wear a correctly fitted, NIOSH approved, respirator or industrial type canister mask in enclosed areas with poor or no ventilation areas, or where TLV levels are likely to be exceeded.

SECTION 9  Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Form</th>
<th>Solid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odor</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
PH Not applicable
Evaporation rate Not applicable
Vapor pressure Not applicable
Vapor density Not applicable
Viscosity Not applicable
Boiling point Not applicable
Solubility in water Insoluble
Specific gravity Not applicable
Density Not applicable

SECTION 10  Stability and Reactivity

CHEMICAL STABILITY
Stable at normal temperatures and storage conditions.

CONDITIONS TO AVOID
Avoid exposure to heat and open flame. Do not puncture, crush or incinerate.

INCOMPATIBILITY
None during normal operation. Avoid exposure to heat, open flame, and corrosives.

DECOMPOSITION
By fire or thermal decomposition, can produce irritating and toxic gases.

HAZARDOUS POLYMERIZATION
Will not occur.

SECTION 11  Toxicological Information

IMMEDIATE (ACUTE) EFFECTS
None known

DELAYED (SUBCHRONIC & CHRONIC) EFFECTS
None known
OTHER DATA
Not available

SECTION 12  Ecological Information
No ecological information available

SECTION 13  Disposal Considerations
Store in impervious inert container and send to smelter for recycling. Must be treated as special waste. In general, this product may be discarded in accordance with the State and Local regulations.

SECTION 14  Transport Information
Lithium Ion batteries are considered to be "Rechargeable batteries" and meet the requirements of transportation by the U.S. Department of Transportation (DOT), International Civil Aviation Administration (ICAO), The 54th edition of International Air Transportation Association (IATA, 2013) special provision A154/A164, International Maritime Dangerous Goods (IMDG) code (2008 Edition) with special provision 188 & 230 and belong to non-dangerous goods.

SECTION 15  Regulatory Information
This product is not hazardous under the criteria of the Federal Occupational Safety and Health Administration (OSHA) Hazard Communication Standard.(29 CFR 1910.1200)


SECTION 16  Other Information
The data in this Product Safety Data Sheet relates only to the specific product designated herein and does not relate to use in combination with any other product or in any process. This PSDS may not meet regulatory requirements in other countries. This information is based on technical information believed to be reliable. It is subject to revision as additional knowledge and experiences are gained.

REFERENCE
International Chemical Safety Cards(ICSCs) International Occupational Safety and Health Information Centre(CIS) 0710 March 1999

Opinion of the scientific committee on toxicity, ecotoxicity and the environment(CSTEE)
Adopted by the CSTEE during the 43rd plenary meeting of 28 May 2004

UN-Recommendations on the Transport of Dangerous Goods Model Regulations. (ST/SG/AC. 10/1/Rev.5)