

Product Safety Data Sheet

LGC Lithium- Ion Rechargeable Battery Pack

LG CHEMICAL LTD

SECTION 1 Product and Company Identification

PRODUCT IDENTIFICATION

HP AO02030XL, LGC 1P2S, Lithium-Ion Polymer Battery Pack

Revision date: June 24, 2013

Battery pack Electric Power Capacity: 31Wh

MANUFACTURING/DISTRIBUTOR

LG Chemical Ltd. Twin Tower Youido-Dong 120, Youngdeungpo-Ku, Seoul, Korea

PHONE NUMBER

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SECTION 2 Composition and Information on Ingredients

| Component | % | CAS Number | Remarks |
|-----------------|------|---|--------------|
| Cases(PC) | 9-11 | 103598-77-2 | No dangerous |
| PCB Assembly | 1-2 | 65997-17-3 7440-50-8 26265-8-7 112-07-2 34590-94-8 Various /A 00000096-48-0 N/A | No dangerous |

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Lithium Ion Cell: LGC ICP3674120L1

| Hazardous Ingredients | % | CAS Number |
|---|-----------|-------------------|
| Aluminum Foil | 2-10 | 7429-90-5 |
| Metal Oxide (proprietary) | 20-50 | |
| Polyvinylidene Fluoride (PVDF) | <5 | 24937-79-9 |
| Copper Foil | 2-10 | 7440-50-8 |
| Carbon (proprietary) | 10-30 | 7440-44-0 |
| Electrolyte (proprietary) | 10-20 | |
| Stainless steel, Nickel and inert materials | Remainder | N/A |

* **Watt-hour : 31 Wh**

UN CLASS

1. Even classified as lithium batteries (UN3480), 2013 IATA Dangerous Goods Regulations 54th edition Packing Instruction 965 section II or IB is applied.

The general and additional requirements apply to all lithium ion cells and batteries prepared for transport according to this packing instruction:

- 1) Section IA applies to lithium ion cells with a Watt-hour rating in excess of 20 Wh and lithium ion batteries with a Watt-hour rating in excess of 100 Wh, or to quantities of lithium ion cells or batteries in excess of those permitted in Section IB of this packing instruction which must be assigned to Class 9 and are subject to all of the applicable requirements of these Regulations;
- 2) Section IB applies to lithium ion cells with a Watt-hour rating not exceeding 20 Wh and lithium ion batteries with a Watt-hour rating not exceeding 100 Wh packed in quantities that exceed the allowance permitted in Section II, Table 965-II; and
- 3) Section II applies to lithium ion cells with a Watt-hour rating not exceeding 20 Wh and lithium ion batteries with a Watt-hour rating not exceeding 100 Wh packed in quantities not exceeding the allowance permitted in Section II, Table 965-II.

TABLE 965-II

| Contents | Lithium ion cells and/or batteries with a Watt-hour rating of 2.7 Wh or less | Lithium ion cells with a Watt-hour rating of more than 2.7 Wh but not more than 20 Wh | Lithium ion batteries with a Watt-hour rating of more than 2.7 Wh but not more than 100 Wh |
|---|--|---|--|
| 1 | 2 | 3 | 4 |
| Maximum number of cells/batteries per package | No limit | 8 cells | 2 Batteries |
| Maximum net quantity per package | 2.5 kg | N/A | N/A |

Cells and/or batteries specified in columns 2, 3 and 4 of Table 965-II must not be combined in the same package.

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 3 subsection 38.3.

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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.

Lithium ion cells and batteries offered for transport are not subject to other additional requirements of the UN Regulations if they meet the following.

- 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.
- And they are out of scope for Special Provision A154 and comply with Special Provision A164.

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

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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 with 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

| | |
|---------------------------|-----------------|
| Flash point | Not applicable |
| Flammable limits in air | Not applicable |
| Lower explosive limits | Not established |
| Upper explosive limits | Not established |
| Auto-ignition temperature | Not available |

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.

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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.

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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

| | |
|---------------------|----------------|
| Form | Solid |
| Odor | Not applicable |
| 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.

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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 (2012 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)

IATA Dangerous Goods Regulations 54th Edition Effective 1 January 2013.

SECTION 16 Other Information

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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)