

## Explanatory sheet about safety of product for transportation

(Safety data sheet for transportation)

### 1. Basic item

Product name: Lithium ion battery ("Lithium ion battery" includes lithium ion polymer battery in this document)  
UN number: 3480  
Product Part Number: Refer to Table 1.  
Manufacturer: LG Chemical, Ltd.  
Address: LG Twin Towers, 128 Yeoui-daero, Yeongdeungpo-gu Seoul 07336, Korea  
Phone number: +82-2-3773-1114

### 2. Product information

Basic composition of the product

This product is a battery which consists of such main component as core battery pack assembled with some Lithium ion cells. And it consists of any combination of plastic casing, tube casing, protection circuit boards, safety devices and interface terminals.

### 3. Safety information

- LG Chemical certifies the battery has passed and satisfied the UN Manual of Tests and Criteria Part III, sub-section 38.3 testing in LG Chemical Shipping.
- LG Chemical manufactured the battery under the quality management program required in UN model regulations 2.9.4(e).

#### 3-1) Component cell

The Watt-hour rating of the component Lithium ion cells is not more than 20Wh.

#### 3-2) Battery pack

1. The Watt-hour rating of the battery is not more than 100Wh.
2. Package of the battery satisfy the following conditions when LG Chemical ships.
  - (1) The product name "Lithium ion batteries" and how to deal with the damage of the package are written on the label.
  - (2) The package has passed the drop test from the height of 1.2m.
  - (3) The package net weight is not more than 10kg.
3. The battery is not defective for safety reasons, not damaged. It is not collected battery for recycling or disposal.
4. The battery is not subject to the fully regulated requirements for Dangerous Goods in ocean and ground transportation.
5. The battery should be transported by Cargo aircraft as UN3480, class 9 Dangerous Goods, and state of charge not exceeding 30%, attached by required marks and labels, according to Packing Instruction 965 Section IB of the ICAO and IATA regulations.

Feb, 9, 2017

Jin Soo Park

LG Chemical Ltd

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Table 1. Model list of application

Battery Information			Cell			Battery Pack			
Lenovo ASM Part Number	Lenovo FRU Part Number	Lenovo Option Part Number	MSDS Type #	Nominal Voltage (V)	Rating Voltage (V)	Watt hour Rating (Wh)	Weight (grams)	Equivalent Lithium Content (grams)	UN38.3 report
42T4539	42T4538 42T4648		SDS_LGCY174	3.60	10.80	57	335	4.68	42T4539_UN38.3
42T4549	42T4548 42T4653		SDS_LGCY174	3.60	10.80	57	350	4.68	42T4549_UN38.3
42T4709	42T4708 42T4849		SDS_LGCY174	3.60	10.80	52	324	4.32	42T4709_UN38.3
42T4715	42T4714 42T4851 42T4968		SDS_LGCY174	3.70	11.10	94	493	7.56	42T4715_UN38.3
42T4738	42T4737 42T4850		SDS_LGCY174	3.60	10.80	57	334	4.68	42T4738_UN38.3
42T4758	42T4757 42T4848		SDS_LGCY174	3.60	10.80	48	334	3.96	42T4758_UN38.3
42T4782	42T4783 42T4854		SDS_LGCY174	3.60	10.80	24	170	1.98	42T4782_UN38.3
42T4788	42T4789 42T4855 42T4797		SDS_LGCY174	3.60	10.80	57	340	4.68	42T4788_UN38.3
42T4796	42T4852 42T4911 42T4803		SDS_LGCY174	3.60	10.80	57	334	4.68	42T4796_UN38.3
42T4802	42T4853 42T4912 42T4969		SDS_LGCY174	3.70	11.10	94	493	7.56	42T4802_UN38.3
42T4806	42T4807 42T4857 42T4973		SDS_LGCY174	3.75	15.00	42	235	3.36	42T4806_UN38.3
42T4814	42T4815 42T4858 42T4974		SDS_LGCY174	3.75	11.25	63	325	5.04	42T4814_UN38.3
42T4830	42T4831 42T4856 42T4970		SDS_LGCY174	3.70	11.10	63	340	5.04	42T4830_UN38.3
42T4836	42T4837 45N1068		SDS_LGCY174	3.70	11.10	63	335	5.04	42T4836_UN38.3
42T4838	42T4839 42T4913		SDS_LGCY174	3.60	14.40	32	334	2.64	42T4838_UN38.3
42T4842	42T4843 42T4971		SDS_LGCY174	3.70	11.10	32	170	2.52	42T4842_UN38.3
42T4866	42T4865		SDS_LGCY174	3.70	11.10	63	335	5.04	42T4866_UN38.3
42T4872	42T4871 42T4942		SDS_LGCY174	3.70	11.10	94	520	7.56	42T4872_UN38.3
42T4882	42T4881		SDS_LGCY174	3.70	11.10	63	325	5.04	42T4882_UN38.3
42T4888	42T4887		SDS_LGCY174	3.60	14.40	32	334	2.64	42T4888_UN38.3
42T4892	42T4891 42T4972		SDS_LGCY174	3.70	11.10	32	170	2.52	42T4892_UN38.3
42T4898	42T4897		SDS_LGCY174	3.60	10.80	57	340	4.68	42T4898_UN38.3
42T4926	42T4927		SDS_LGCY174	3.60	10.80	48	334	3.96	42T4926_UN38.3
42T4946	42T4945		SDS_LGCY174	3.70	11.10	32	190	2.52	42T4946_UN38.3
42T4952	42T4951		SDS_LGCY174	3.70	11.10	63	330	5.04	42T4952_UN38.3
42T4956	42T4955		SDS_LGCY174	3.70	11.10	32	190	2.52	42T4956_UN38.3
42T4962	42T4961		SDS_LGCY174	3.70	11.10	63	330	5.04	42T4962_UN38.3
42T5228	42T5227 42T4552 42T4668		SDS_LGCY174	3.60	14.40	38	240	3.12	42T5228_UN38.3
45N1004	45N1005		SDS_LGCY174	3.60	10.80	57	334	4.68	45N1004_UN38.3
45N1010	45N1011		SDS_LGCY174	3.70	11.10	94	493	7.56	45N1010_UN38.3
45N1024	45N1025		SDS_LGCY174	3.70	11.10	63	335	5.04	45N1024_UN38.3
45N1028	45N1029		SDS_LGCY174	3.70	11.10	94	520	7.56	45N1028_UN38.3
45N1048	45N1049		SDS_LGCY174	3.60	10.80	48	335	3.96	45N1048_UN38.3
45N1054	45N1055		SDS_LGCY174	3.70	11.10	62	330	5.04	45N1054_UN38.3
45N1058	45N1059		SDS_LGCY174	3.70	11.10	63	330	5.04	45N1058_UN38.3
45N1062	45N1063		SDS_LGCY174	3.70	11.10	63	330	5.04	45N1062_UN38.3
45N1078	45N1079		SDS_LGCY174	3.70	11.10	63	325	5.04	45N1078_UN38.3

Battery Information			Cell		Battery Pack				
Lenovo ASM Part Number	Lenovo FRU Part Number	Lenovo Option Part Number	MSDS Type #	Nominal Voltage (V)	Rating Voltage (V)	Watt hour Rating (Wh)	Weight (grams)	Equivalent Lithium Content (grams)	UN38.3 report
45N1106	45N1107		SDS_LGCY174	3.60	10.80	48	334	3.96	45N1106_UN38.3
45N1130	45N1131 45N1735		SDS_LGCY174	3.60	10.80	48	310	3.96	45N1130_UN38.3
45N1136	45N1137 45N1738		SDS_LGCY174	3.74	11.22	72	345	5.70	45N1136_UN38.3
45N1146	45N1147		SDS_LGCY174	3.60	10.80	57	330	4.68	45N1146_UN38.3
45N1152	45N1153		SDS_LGCY174	3.70	11.10	100	495	8.10	45N1152_UN38.3
45N1160	45N1161		SDS_LGCY174	3.60	10.80	48	330	3.96	45N1160_UN38.3
45N1760	45N1761		SDS_LGCY174	3.60	10.80	48	330	3.96	45N1760_UN38.3
SB10H45071	00NY486		SDS_LGCY174	3.60	10.80	48	330	3.96	SB10H45071_UN38.3
SB10J78996	00HW048		SDS_LGCY174	3.75	7.50	24	125	1.92	SB10J78996_UN38.3
SB10K97575	01AV418		SDS_LGCY174	3.65	14.60	41	335	3.38	SB10K97575_UN38.3
SB10K97583	01AV426		SDS_LGCY174	3.60	10.80	28	335	3.96	SB10K97583_UN38.3
SB10K97585	01AV428		SDS_LGCY174	3.75	11.25	72	335	5.76	SB10K97585_UN38.3

**MATERIAL SAFETY DATA SHEET**

**Product Name: Lithium Ion Rechargeable Battery**

**Product Code: None**

( All Cylindrical Cell LG Chem. manufactured and whose capacity is less than 20Wh, And All Cylindrical pack capacity is less than 100Wh)

**1. Chemical Product and Company Identification**

**Manufacturer**

LG Chemical Limited

Twin Tower

Youido-Dong, Youngdeungpo-Ku

Seoul, Korea

**Emergency Telephone Number**

82-2-3773-7256

**2. Composition Information**

Hazardous Ingredients	%	CAS Number
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Aluminum Foil	2-10	7429-90-5
Nickel compound (proprietary)	0-25	
Manganese compound (proprietary)	0-15	
Cobalt compound (proprietary)	4-50	
Styrene-Butadiene-Rubber	<1	
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

### **Emergency Overview**

May explode in a fire, which could release hydrogen fluoride gas.  
Use extinguishing media suitable for materials burning in fire.

## **3. Hazards Identification**

### **Primary routes of entry**

- Skin contact : NO
- Skin absorption : NO
- Eye contact : NO
- Inhalation : NO
- Ingestion : NO

### **Symptoms of exposure**

Skin contact

No effect under routine handling and use.

Skin absorption

No effect under routine handling and use.

Eye contact

No effect under routine handling and use.

Inhalation

No effect under routine handling and use.

Reported as carcinogen

Not applicable

## 4. First Aid Measures

**Inhalation**

Not a health hazard.

**Eye contact**

Not a health hazard.

**Skin contact**

Not a health hazard.

**Ingestion**

If swallowed, obtain medical attention immediately.

**IF EXPOSURE TO INTERNAL MATERIALS WITHIN CELL DUE TO  
DAMAGED OUTER CASING, THE FOLLOWING ACTIONS ARE  
RECOMMENDED ;**

**Inhalation**

Leave area immediately and seek medical attention.

**Eye contact**

Rinse eyes with water for 15 minutes and seek medical attention.

**Skin contact**

Wash area thoroughly with soap and water and seek medical attention.

**Ingestion**

Drink milk/water and induce vomiting; seek medical attention.



## 5. Fire Fighting Measures

### General Hazard

Cell is not flammable but internal organic material will burn if the cell is incinerated. Combustion products include, but are not limited to hydrogen fluoride, carbon monoxide and carbon dioxide.

### Extinguishing Media

Use extinguishing media suitable for the materials that are burning.

### Special Firefighting Instructions

If possible, remove cell(s) from fire fighting area. If heated above 125°C, cell(s) may explode/vent.

### Firefighting Equipment

Use NIOSH/MSHA approved full-face self-contained breathing apparatus (SCBA) with full protective gear.

## 6. Accidental Release Measures

### On Land

Place material into suitable containers and call local fire/police department.

### In Water

If possible, remove from water and call local fire/police department.

## 7. Handling and Storage

### Handling

No special protective clothing required for handling individual cells.

### Storage

Store in a cool, dry place.

## 8. Exposure Controls / Personal Protection

### Engineering controls

Keep away from heat and open flame. Store in a cool dry place.

## Personal Protection

### Respirator

Not required during normal operations. SCBA required in the event of a fire.

### Eye/face protection

Not required beyond safety practices of employer.

### Gloves

Not required for handling of cells.

### Foot protection

Steel toed shoes recommended for large container handling.

## 9. Physical and Chemical Properties

State	Solid
Odor	N/A
PH	N/A
Vapor pressure	N/A
Vapor density	N/A
Boiling point	N/A
Solubility in water	Insoluble
Specific gravity	N/A
Density	N/A

## 10. Stability and Reactivity

### Reactivity

None

### Incompatibilities

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

### Hazardous Decomposition Products

None during normal operating conditions. If cells are opened, hydrogen fluoride and carbon monoxide may be released.

### Conditions To Avoid

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

## 11. Toxicological Information

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

Sensitization	Teratogenicity	Reproductive toxicity	Acute toxicity
NO	NO	NO	NO

If the cells are opened through misuse or damage, discard immediately.

Internal components of cell are irritants and sensitizers.

## 12. Ecological Information

Some materials within the cell are bioaccumulative. Under normal conditions, these materials are contained and pose no risk to persons or the surrounding environment.

## 13. Disposal Considerations

California regulated debris

RCRA Waste Code : Nonregulated

Dispose of according to all federal, state, and local regulations.

## 14. Transport Information

Lithium batteries are classified in Class 9 – Miscellaneous dangerous goods as:

- UN 3480, Lithium ion batteries

- UN 3481, Lithium ion batteries contained in equipment; or
- UN 3481, Lithium ion batteries packed with equipment.

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

- The International Civil Aviation Organization (ICAO) Technical Instructions,
- The International Air Transport Association (IATA) Dangerous Goods Regulations
- The International Maritime Dangerous Goods (IMDG) Code,
- 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,

If those lithium-ion batteries are packed with or contained in an equipment, then it is the responsibility of the shipper to ensure that the consignment are packed in compliance to the 58<sup>th</sup> edition of 2017 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). If those lithium-ion batteries are packed with or contained in an equipment, UN No. is UN3481

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 III, subsection 38.3

## 15. Regulatory Information

OSHA hazard communication standard (29 CFR 1910.1200)

Hazardous       Non-hazardous

## 16. Model list of application

Refer to Table 1.