

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 satisfies 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.

Jan, 1, 2018

Jin Soo Park

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Battery Part Numbers			Battery Information						
Lenovo ASM Lenovo PN Part Number	Lenovo FRU Part Number	Lenovo model name	MSDS Type #	UN DOT 38.3 Test Certificate	Cell Voltage (V)	Battery Voltage (V)	Watt hour Rating (Wh)	Weight (grams)	Equivalent Lithium Content (grams)
42T4549	42T4548 42T4653		SDS_LGCY181	42T4549_UN38.3	3.60	10.80	57	350	4.68
42T4715	42T4714 42T4851 42T4968		SDS_LGCY181	42T4715_UN38.3	3.70	11.10	94	493	7.56
42T4758	42T4757 42T4848		SDS_LGCY181	42T4758_UN38.3	3.60	10.80	48	334	3.96
42T4802	42T4803 42T4853 42T4912 42T4969 42T4815		SDS_LGCY181	42T4802_UN38.3	3.70	11.10	94	493	7.56
42T4814	42T4858 42T4974		SDS_LGCY181	42T4814_UN38.3	3.75	11.25	63	325	5.04
42T4838	42T4839 42T4913		SDS_LGCY181	42T4838_UN38.3	3.60	14.40	32	334	2.64
42T4872	42T4871 42T4942		SDS_LGCY181	42T4872_UN38.3	3.70	11.10	94	520	7.56
42T4882	42T4881		SDS_LGCY181	42T4882_UN38.3	3.70	11.10	63	325	5.04
42T4898	42T4897		SDS_LGCY181	42T4898_UN38.3	3.60	10.80	57	340	4.68
42T4946	42T4945		SDS_LGCY181	42T4946_UN38.3	3.70	11.10	32	190	2.52
42T4952	42T4951		SDS_LGCY181	42T4952_UN38.3	3.70	11.10	63	330	5.04
45N1004	45N1005		SDS_LGCY181	45N1004_UN38.3	3.60	10.80	57	334	4.68
45N1010	45N1011		SDS_LGCY181	45N1010_UN38.3	3.70	11.10	94	493	7.56
45N1024	45N1025		SDS_LGCY181	45N1024_UN38.3	3.70	11.10	63	335	5.04
45N1028	45N1029		SDS_LGCY181	45N1028_UN38.3	3.70	11.10	94	520	7.56
45N1048	45N1049		SDS_LGCY181	45N1048_UN38.3	3.60	10.80	48	335	3.96
45N1054	45N1055		SDS_LGCY181	45N1054_UN38.3	3.70	11.10	62	330	5.04
45N1058	45N1059		SDS_LGCY181	45N1058_UN38.3	3.70	11.10	63	330	5.04
45N1062	45N1063		SDS_LGCY181	45N1062_UN38.3	3.70	11.10	63	330	5.04
45N1078	45N1079		SDS_LGCY181	45N1078_UN38.3	3.70	11.10	63	325	5.04
45N1106	45N1107		SDS_LGCY181	45N1106_UN38.3	3.60	10.80	48	334	3.96
45N1130	45N1131 45N1735		SDS_LGCY181	45N1130_UN38.3	3.60	10.80	48	310	3.96
45N1136	45N1137 45N1738		SDS_LGCY181	45N1136_UN38.3	3.74	11.22	72	345	5.70
45N1146	45N1147		SDS_LGCY181	45N1146_UN38.3	3.60	10.80	57	330	4.68
45N1152	45N1153		SDS_LGCY181	45N1152_UN38.3	3.70	11.10	100	495	8.10
45N1160	45N1161		SDS_LGCY181	45N1160_UN38.3	3.60	10.80	48	330	3.96
45N1760	45N1761		SDS_LGCY181	45N1760_UN38.3	3.60	10.80	48	330	3.96
SB10H45071	00NY486		SDS_LGCY181	SB10H45071_UN38. 3	3.60	10.80	48	330	3.96
SB10J78996	00HW048		SDS_LGCY181	SB10J78996_UN38.3	3.75	7.50	24	125	1.92
SB10K97575	01AV418		SDS_LGCY181	SB10K97575_UN38. 3	3.65	14.60	41	335	3.38
SB10K97583	01AV426 01AV491		SDS_LGCY181	SB10K97583_UN38. 3	3.60	10.80	28	335	3.96
SB10K97585	01AV428 01AV492		SDS_LGCY181	SB10K97585_UN38. 3	3.75	11.25	72	335	5.76

Battery Part Numbers			Battery Information						
Lenovo ASM Lenovo PN Part Number	Lenovo FRU Part Number	Lenovo model name	MSDS Type #	UN DOT 38.3 Test Certificate	Cell Voltage (V)	Battery Voltage (V)	Watt hour Rating (Wh)	Weight (grams)	Equivalent Lithium Content (grams)
5B10K10213		L14L4A01	SDS_LGCY181	5B10K10213_UN38.3	3.60	14.40	32	230	2.64
5B10H30034		L14L4A01	SDS_LGCY181	5B10H30034_UN38.3	3.60	14.40	32	230	2.64
5B10K10170		L14L4E01	SDS_LGCY181	5B10K10170_UN38.3	3.65	14.60	41	240	3.38
5B10H30033		L14L4E01	SDS_LGCY181	5B10H30033_UN38.3	3.65	14.60	41	240	3.38
5B10H70341		L15L4A01	SDS_LGCY181	5B10H70341_UN38.3	3.60	14.40	32	213	2.64
5B10K02218		L15L4A01	SDS_LGCY181	5B10K02218_UN38.3	3.60	14.40	32	215	2.64
5B10L04167		L15L3A03	SDS_LGCY181	5B10L04167_UN38.3	3.60	10.80	24	166	1.98
5B10L04165		L15L3A02	SDS_LGCY181	5B10L04165_UN38.3	3.60	10.80	24	164	1.98
5B10L04164		L15L4A02	SDS_LGCY181	5B10L04164_UN38.3	3.60	14.40	32	208	2.64
5B10L12771		L15L4A01	SDS_LGCY181	5B10L12771_UN38.3	3.60	14.40	32	212	2.64
5B10L79053		L15L6A01	SDS_LGCY181	5B10L79053_UN38.3	3.60	10.80	48	308	3.96
121-001089		L09L6Y02	SDS_LGCY181	121-001089_UN38.3	3.60	10.80	48	340	3.96
121-500042		L11L6Y01	SDS_LGCY181	121-500042_UN38.3	3.60	10.80	48	300	3.96
121-500049		L11L6Y01	SDS_LGCY181	121-500049_UN38.3	3.60	10.80	48	335	3.96
121-500052		L11L6F01	SDS_LGCY181	121-500052_UN38.3	3.70	11.10	62	330	5.04
121-500063		L11L6F01	SDS_LGCY181	121-500063_UN38.3	3.70	11.10	62	330	5.04
121-500126		L12L6E01	SDS_LGCY181	121-500126_UN38.3	3.70	11.10	62	330	5.04
121-500168		L12L4A01	SDS_LGCY181	121-500168_UN38.3	3.60	10.80	32	250	3.96
121-500173		L12L4E01	SDS_LGCY181	121-500173_UN38.3	3.70	14.80	41	250	3.36
5B10K10161		L12L4E01	SDS_LGCY181	5B10K10161_UN38.3	3.70	14.80	41	250	3.36
121-500176		L12L4A02	SDS_LGCY181	121-500176_UN38.3	3.60	10.80	32	250	3.96
5B10K10240		L12L4A02	SDS_LGCY181	5B10K10240_UN38.3	3.60	14.40	32	250	2.64
121-500191		L12L4E55	SDS_LGCY181	121-500191_UN38.3	3.70	14.80	41	300	3.36
121-500211		L12L6Z53	SDS_LGCY181	121-500211_UN38.3	3.60	10.80	48	310	3.96
121-500241		L12L4E55	SDS_LGCY181	121-500241_UN38.3	3.70	14.80	41	230	3.36
5B10K10196		L12L4E55	SDS_LGCY181	5B10K10196_UN38.3	3.70	14.80	41	230	3.36
121-500244		L13L4A01	SDS_LGCY181	121-500244_UN38.3	3.60	14.40	32	220	2.64
5B10K10151		L13L4A01	SDS_LGCY181	5B10K10151_UN38.3	3.60	14.40	32	220	2.64
121-500247		L13L4E61	SDS_LGCY181	121-500247_UN38.3	3.70	14.80	42	235	3.36
121-500262		L13L4A61	SDS_LGCY181	121-500262_UN38.3	3.60	14.40	32	230	2.64

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 59th edition of 2018 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.