

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

LG Chemical Ltd

Jin Soo Park
Vice chairman&CEO
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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)
45N1122	45N1123		SDS_LGPO181	45N1122_UN38.3	3.70	11.10	47	260	3.96
45N1166	45N1167		SDS_LGPO181	45N1166_UN38.3	3.70	14.80	63	350	5.28
45N1726	45N1727		SDS_LGPO181	45N1726_UN38.3	3.70	3.70	33	175	2.68
45N1748	45N1749		SDS_LGPO181	45N1748_UN38.3	3.70	7.40	34	180	2.82
SB10F46440	00HW002		SDS_LGPO181	SB10F46440_UN38.3	3.80	15.20	51	270	4.03
SB10F46442	00HW004		SDS_LGPO181	SB10F46442_UN38.3	3.70	7.40	36	180	2.90
SB10F46444	00HW006		SDS_LGPO181	SB10F46444_UN38.3	3.70	7.40	27	200	2.15
SB10F46446	00HW008		SDS_LGPO181	SB10F46446_UN38.3	3.80	15.20	67	315	5.32
SB10F46454	00HW016		SDS_LGPO181	SB10F46454_UN38.3	3.80	7.60	32	154	2.56
SB10F46458	00HW020		SDS_LGPO181	SB10F46458_UN38.3	3.80	11.40	53	260	4.15
SB10F46464	00HW026		SDS_LGPO181	SB10F46464_UN38.3	3.80	15.20	45	240	3.59
SB10F46466	00HW028 01AV438 01AV473		SDS_LGPO181	SB10F46466_UN38.3	3.80	15.20	53	250	4.19
SB10H45075	00NY490 01AV476		SDS_LGPO181	SB10H45075_UN38.3	3.80	15.20	67	365	5.32
SB10H45077	00NY492 01AV477		SDS_LGPO181	SB10H45077_UN38.3	3.80	11.40	90	460	7.22
SB10J78991	00HW043		SDS_LGPO181	SB10J78991_UN38.3	3.80	11.40	42	220	3.37
SB10J78993	00HW045		SDS_LGPO181	SB10J78993_UN38.3	3.82	7.64	37	168	2.95
SB10J78997	01AV400		SDS_LGPO181	SB10J78997_UN38.3	3.80	11.40	42	220	3.37
SB10J79000	01AV403		SDS_LGPO181	SB10J79000_UN38.3	3.80	7.60	40	180	3.20
SB10K97566	01AV409 01AV440 01AV457		SDS_LGPO181	SB10K97566_UN38.3	3.80	15.20	56	250	4.49
SB10K97569	01AV412		SDS_LGPO181	SB10K97569_UN38.3	3.70	11.10	45	235	3.68
SB10K97577	01AV420 01AV489		SDS_LGPO181	SB10K97577_UN38.3	3.80	11.40	24	140	1.89
SB10K97580	01AV423 01AV490		SDS_LGPO181	SB10K97580_UN38.3	3.80	11.40	24	140	1.89
SB10L84121	00UR890 01AV493		SDS_LGPO181	SB10L84121_UN38.3	3.80	15.20	32	220	2.52
SB10K97586	01AV429 01AV494		SDS_LGPO181	SB10K97586_UN38.3	3.86	11.58	57	248	4.44
SB10K97589	01AV432		SDS_LGPO181	SB10K97589_UN38.3	3.80	15.20	51	250	4.09
SB10K97592	01AV435		SDS_LGPO181	SB10K97592_UN38.3	3.80	11.40	42	220	3.37
SB10K97595	01AV442		SDS_LGPO181	SB10K97595_UN38.3	3.80	11.40	42	220	3.37
SB10K97599	01AV454	L16L4P91	SDS_LGPO181	SB10K97599_UN38.3	3.86	7.72	42	170	3.26
SB10K97606	01AV445	L17L3P51	SDS_LGPO181	SB10K97606_UN38.3	3.80	11.40	45	235	3.68
SB10K97610	01AV463	L17L3P52	SDS_LGPO181	SB10K97610_UN38.3	3.80	11.40	45	235	3.68
SB10K97617	01AV470	L17L6P71	SDS_LGPO181	SB10K97617_UN38.3	3.80	11.40	48	240	3.78
SB10K97620	01AV478	L17L3P71	SDS_LGPO181	SB10K97620_UN38.3	3.86	11.58	57	240	4.44
SB10K97625	01AV481	L17L3P53	SDS_LGPO181	SB10K97625_UN38.3	3.80	11.40	45	245	3.68

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)
SB10K97630	01AV486	L17L3P54	SDS_LGPO181	SB10K97630_UN38. 3	3.80	11.40	42	210	3.37
5B10M52816		L14L2P21	SDS_LGPO181	5B10M52816_UN38. 3	3.70	7.40	30	161	2.45
5B10M52817		L14L3P21	SDS_LGPO181	5B10M52817_UN38. 3	3.70	11.10	45	220	3.68
5B10K10219		L14L2P22	SDS_LGPO181	5B10K10219_UN38. 3	3.80	7.60	35	160	2.78
5B10H17230		L14L2P22	SDS_LGPO181	5B10H17230_UN38. 3	3.80	7.60	35	160	2.78
5B10K85625		L15L4PC0	SDS_LGPO181	5B10K85625_UN38. 3	3.80	7.60	46	208	7.33
5B10K85056		L15L2PB1	SDS_LGPO181	5B10K85056_UN38. 3	3.80	7.60	35	160	2.78
5B10K85055		L15L3PB0	SDS_LGPO181	5B10K85055_UN38. 3	3.80	11.40	53	220	4.17
5B10K90803		L15L2PB2	SDS_LGPO181	5B10K90803_UN38. 3	3.80	7.60	30	156	2.43
5B10K90804		L15L2PB4	SDS_LGPO181	5B10K90804 _UN38.3	3.80	7.60	30	156	2.43
5B10K88049		L15L3PB1	SDS_LGPO181	5B10K88049_UN38. 3	3.70	11.10	45	221	3.68
5B10M52738		L16L4PB1	SDS_LGPO181	5B10M52738_UN38. 3	3.80	7.60	48	194	3.79
5B10M53744		L16L6PC1	SDS_LGPO181	5B10M53744_UN38. 3	3.80	11.40	72	291	5.69
5B10M55950		L16L4PB2	SDS_LGPO181	5B10M55950_UN38. 3	3.80	15.20	55	247	4.49
5B10M49825		L14L2P21	SDS_LGPO181	5B10M49825_UN38. 3	3.70	7.40	30	161	2.45
5B10M49826		L15L3PB0	SDS_LGPO181	5B10M49826_UN38. 3	3.80	11.40	53	220	4.17
5B10M50524		L15L2PB1	SDS_LGPO181	5B10M50524_UN38. 3	3.80	7.60	35	161	2.78
5B10M91442		L16L2PB2	SDS_LGPO181	5B10M91442_UN38. 3	3.70	7.40	30	140	2.45
5B10M91443		L16L2PB3	SDS_LGPO181	5B10M91443_UN38. 3	3.80	7.60	35	141	2.78
5B10N03289		L16L4PB3	SDS_LGPO181	5B10N03289_UN38. 3	3.80	7.60	48	191	3.79
5B10N87357		L17L3P61	SDS_LGPO181	5B10N87357_UN38. 3	3.80	11.40	36	150	2.84
5B10P54006		L17L2PB1	SDS_LGPO181	5B10P54006_UN38. 3	3.80	7.60	30	139	2.43
5B10P54002		L17L2PB2	SDS_LGPO181	5B10P54002_UN38. 3	3.86	7.72	39	151	3.03
5B10P54004		L17L2PB3	SDS_LGPO181	5B10P54004_UN38. 3	3.80	7.60	30	142	2.43
5B10P54000		L17L2PB4	SDS_LGPO181	5B10P54000_UN38. 3	3.86	7.72	39	155	3.03
5B10P98186		L17L2PB5	SDS_LGPO181	5B10P98186_UN38. 3	3.86	7.72	39	188	3.03
5B10P98187		L17L2PB5	SDS_LGPO181	5B10P98187_UN38. 3	3.86	7.72	39	188	3.03
5B10P98185		L17L2PB6	SDS_LGPO181	5B10P98185_UN38. 3	3.86	7.72	39	191	3.03
5B10Q13162		L17L3PB0	SDS_LGPO181	5B10Q13162_UN38. 3	3.80	11.40	42	183	3.37
5B10Q39206		L14L2P21	SDS_LGPO181	5B10Q39206_UN38. 3	3.70	7.40	30	161	2.45
5B10Q39201		L15L3PB0	SDS_LGPO181	5B10Q39201_UN38. 3	3.80	11.40	53	220	4.17
5B10Q39198		L17L3P61	SDS_LGPO181	5B10Q39198_UN38. 3	3.80	11.40	36	150	2.84
5B10Q39197		L17L3PE0	SDS_LGPO181	5B10Q39197_UN38. 3	3.80	11.40	53	239	4.17

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)
121-500164		L12L4P62	SDS_LGPO181	121-500164_UN38.3	3.70	7.40	52	260	4.26
121-500206		L13L1P21	SDS_LGPO181	121-500206_UN38.3	3.70	3.70	18	102	1.42
121-500224		L13L4P21	SDS_LGPO181	121-500224_UN38.3	3.70	7.40	34	300	2.82
121-500249		L13L4P01	SDS_LGPO181	121-500249_UN38.3	3.70	7.40	48	264	3.97
121-500253		L13L4P61	SDS_LGPO181	121-500253_UN38.3	3.70	7.40	44	232	3.72
121-500255		L13L3P61	SDS_LGPO181	121-500255_UN38.3	3.70	11.10	35	196	2.88
5B10G75096		L14L4P71	SDS_LGPO181	5B10G75096_UN38. 3	3.80	7.60	34	173	3.16
5B10K10176		L14L4P71	SDS_LGPO181	5B10K10176_UN38. 3	3.80	7.60	34	173	3.16
5B10H55224		L14L4P24	SDS_LGPO181	5B10H55224_UN38. 3	3.80	7.60	67	290	5.29
5B10J40264		L15L4P71	SDS_LGPO181	5B10J40264_UN38.3	3.80	7.60	40	350	3.30
5B10J46130		L14L4P72	SDS_LGPO181	5B10J46130_UN38.3	3.80	7.60	40	175	3.20
5B10K10180		L14L3P21	SDS_LGPO181	5B10K10180_UN38. 3	3.70	7.40	30	161	2.43
5B10K10214		L14L3P21	SDS_LGPO181	5B10K10214_UN38. 3	3.70	11.10	45	220	3.65
5B10K90801		L15L4PC1	SDS_LGPO181	5B10K90801_UN38. 3	3.80	7.60	40	180	3.16
5B10K90802		L15L4PC2	SDS_LGPO181	5B10K90802_UN38. 3	3.80	7.60	52	248	4.09
5B10L79291		L15L4PC3	SDS_LGPO181	5B10L79291_UN38.3	3.86	7.72	41	164	3.24

MATERIAL SAFETY DATA SHEET

Product Name : Lithium-ion Polymer Battery

Product Code : None

(All Polymer cell LG chem. manufactured and whose capacity is less than
20Wh

And All Polymer 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

82-2-3773-6593

2. Composition Information

Hazardous Ingredients	%	CAS Number
Emergency Overview		
May explode in a fire, which could release hydrogen fluoride gas. Use extinguishing media suitable for materials burning in fire.		
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

* Not every product includes all of these materials

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 SectionII 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.