



- **History**

[illegible]

The Attached MSDS accurately represents the chemical construction, of the HP Batteries listed below.

No.	Model	HP RMN	Project P/N	Wh	Cell type
1	CA06055	HSTNN-LB4X	718676-421	55	18650 B4
2	CA06055XL	HSTNN-LB4Y	718676-421 718676-422	55	18650 C2 / C4
3	CA09100	HSTNN-LB4Z	718678-421	91	18650 D1
4	CC06055	HSTNN-LB2F	628368-421	55	18650 B4
5	CC06055XL	HSTNN-LB2H	628369-421	55	18650 C2
6	CC06062	HSTNN-LB2G	628370-421	62	18650 C2
7	CC09100	HSTNN-LB2I	630919-421	100	18650 D1
8	FP06047	HSTNN-LB4J	707616-421	47	18650 S3
9	FP09093	HSTNN-LB4K	707617-421	93	18650 C2
10	HY04041	HSTNN-LB4U	717861-421	41	18650 C2
11	MO09100	HSTNN-LB3P	672326-421	100	18650 D1
12	OA03031	HSTNN-LB5Y	746458-421 746458-422	31	18650 C2 / C4
13	OA04041	HSTNN-LB5S	740004-421	41	18650 C2 / C4
14	PH06047	HSTNN-LB1A	587706-421	47	18650 S3
15	PI06047	HSTNN-LB4N	709988-421	47	18650 S3
16	PI06062	HSTNN-LB4O	709989-421	62	18650 C2
17	PR06047	HSTNN-LB2R	633733-421	47	18650 S3
18	PR08073	HSTNN-LB2S	633734-421	73	18650 B4
19	VH08075XL	HSTNN-LB2Q	632114-421	75	18650 C2
20	VH08083	HSTNN-LB2P	632113-421	83	18650 C2
21	VI04041	HSTNN-LB6I	756478-421	41	18650 C2 / C4
22	VI04044	HSTNN-LB6J	756479-421	44	18650 D1
23	VI04048	HSTNN-LB6K	756480-421	48	18650 E1
24	AO02030XL	HSTNN-LB5O	728250-421	30	ICP3674120L1
25	A2304051XL	HSTNN-LB5R	738075-421	51	ICP3768110L2
26	CD02031	HSTNH-L01B	733057-422	31	ICP3473131L1
27	CM03050XL	HSTNN-LB4R	716724-421	50	ICP666180L1
28	KT02025XL	HSTNN-LB6F	753330-421	25	ICP3076120L1
29	MA02025XL	HSTNN-LB5B	721895-421	25	ICP3076120L1
30	ME03037XL	HSTNN-LB6O	787089-421	37	ICP485780A1

31	MY02021XL	HSTNN-LB5C	721896-421	21	ICP289791L1
32	NP03043XL	HSTNN-LB6L	760944-421	43	ICP606080L1
33	PE03036XL	HSTNN-LB6M	766801-421	36	ICP485780A1
34	PL02029XL	HSTNN-LB6B	751681-421	29	ICP606080L1
35	PX03050XL (Pol)	HSTNN-LB4P	714762-421	50	ICP646480L1
36	PX03050XL (Pri)	HSTNN-LB4P	714762-422	50	ICP666180L1
37	RG04051XL	HSTNN-LB5Q	734746-421	51	ICP3768110L2
38	RR04058	HSTNN-LB6N	778951-421	58	ICP606080L1
39	SK02030XL	HSTNN-LB6G	756186-421	30	ICP556790L1
40	SB03046XL	HSTNN-LB4T	716726-421	46	ICP556790L1
41	HV02032XL	HSTNN-LB6P	796219-421	32	ICP606080A2
42	DB03036	HSTNN-LB6Q	796930-421	36	18650 E1
43	KI04041	HSTNN-LB6R	800009-421	41	18650 C4
44	KI04048	HSTNN-LB6S	800010-421	48	18650 E1
45	HS03031	HSTNN-LB6U	807611-421	31	18650 C4
46	HS04041	HSTNN-LB6V	807612-421	41	18650 C4
47	CI03048XL	HSTNN-LB6T	801517-421 801517-422	48	ICP606080A2
48	DO02033XL	HSTNN-LB6Y	810749-421	33	ICP3182113L1
49	AI06096XL	HSTNN-LB6X	808397-421	96	ICP606080A2
50	ZO04064XL	HSTNN-LB6W	808396-421 808396-422	64	ICP606080A2
51	RI06055XL	HSTNN-LB6Z	811063-421	55	18650 C4
52	RO06055XL	HSTNN-LB7A	811064-421	55	18650 C4
53	MU06055	HSTNN-LB0X	586006-421	55	18650 B4
54	HV03048XL	HSTNN-LB7B	818418-421	48	ICP606080A2
55	PG03064XL	HSTNN-LB7C	831532-421	64	ICP3678122
56	GI02033XL	HSTNN-LB7D	832489-421	33	ICP3182113L1
57	Vail	HSTNN-LB11	395794-422	69	ICR18650 A2
58	MU06062	HSTNN-LB0Y	586028-421	62	ICR18650 C2
59	BP02041XL	HSTNN-LB7H	849569-421	41	ICP666180B1
60	SE03041XL	HSTNN-LB7G	849568-421	41	ICP496080L1
61	SG03041XL	HSTNN-LB7E	849048-421	41	ICP496080L1
62	SG03061XL	HSTNN-LB7F	849049-421	61	ICP666180B1
63	VE06047	HSTNN-LB42	436281-422	47	ICR18650S2

64	MT03028	HSTNN-LB3A	646656-421	28	ICR18650B4
65	MT06055	HSTNN-LB3B	646657-421	55	ICR18650B4
66	TA03051XL	HSTNN-LB7J	854047-421	51	ICP506480L1
67	ST03049XL	HSTNN-LB7K	854050-421	49	ICP505295L1
68	SW02032XL	HSTNN-LB7N	859470-421	32	ICP2982111L1
69	DR02043XL	HSTNN-LB7M	859027-421	43	ICP3678122L1
70	RR03048XL	HSTNN-LB7I	851477-422	48	ICP606080A2
71	SH03057XL	HSTNN-LB7L	859026-421	57	ICP368598
72	CN03057XL	HSTNN-LB7L	901308-421	57	ICP368598
73	OWK- INTERNAL			93	18650 C4
74	OWK- EXTERNAL			73	18650 HG2
75	BI03041XL	HSTNN-LB7P	843537-421	41	ICP496080L1
76	ON03041XL	HSTNN-LB7P	915230-421	41	ICP496080L1
77	BK03041XL	HSTNN-LB7S	916366-421	41	ICP496080L1
78	KN02037XL	HSTNN-LB7R	916365-421	37	ICP606080C1
79	WA03048XL	HSTNN-LB7T	916367-421	48	ICP606080A2
80	LK03055XL	HSTNN-LB7U	916368-421	55	ICP606080C1
81	CA09100	HSTNN-LB4Z	718678-421	100	18650 D2
82	CI03048XL	HSTNN-LB6T	801517-421 801517-422	48	ICP606080A2
83	ZO04064XL	HSTNN-LB6W	808396-421 808396-422	64	ICP606080A2
84	JC03031	HSTNN-LB7V	919681-421	31	18650 C4
85	JC04041	HSTNN-LB7W	919682-421	41	18650 C4
86	TF03041XL	HSTNN-LB7X	920046-421	41	ICP496080L1
87	FM08082	HSTNN-LB8A	922752-421	82	INR18650C4
88	FM08086	HSTNN-LB8B	922753-421	86	INR18650 HG2
89	PV06055	HSTNN-LB7Z	922200-421	55	INR18650 HG2
90	PU08073	HSTNN-LB7Y	922199-421 922199-422	73	INR18650 HG2
91	BF04043XL	HSTNN-LB8C	924843-421	43	P1783C7A1/P4158 87A1/P41588A2
92	CR03049XL	HSTNN-LB8D	924844-421	49	P2690A5A1
93	CM03050XL	HSTNN-LB4R	716724-421	50	ICP666180B1
94	CP03060XL	HSTNN-LB8E	929066-421	60	ICP368598B1

95	SS03050XL	HSTNN-LB8G	932823-421	50	P604883A1
96	TT03056XL	HSTNN-LB8H	923824-421	56	P615383A1
97	CD03048XL	HSTNN-LB8F	931702-421	48	ICP606080A2
98	JC06062	HSTNN-LB8I	L03306-421	62	18650C4
99	HT03041XL	HSTNN-LB8L	L11421-421	41	ICP496080L1
100	HT03041XL	HSTNN-LB8M	L11421-422 L11421-423	41	ICP496080L1
101	LK03048XL	HSTNN-LB8J	L09911-421	48	ICP606080A2
102	RU03048XL	HSTNN-LB8K	L12717-421	48	ICP606080A2
103	PV04036	HSTNN-LB8N	L40874-421	36	INR18650 HG2
104	SA04055XL	HSTNN-LB8O	L43248-421	55	P515974A1
105	MD02040XL	HSTNN-LB8P	L63999-421	40	P368598B1
106	CC03053XL	HSTNN-LB8Q	L77608-421 L77608-422	53	655180A1
107	CX03053XL	HSTNN-LB8R	L77624-421 L77624-422	53	655180A1
108	PV03043XL	HSTNN-LB8S	L83388-421	43	446872A1
109	BC03060XL	HSTNN-LB8T	L84182-421	60	P368598B1
110	HW03041XL	HSTNN-LB8U	L96887-421	41	P515974A1
111	PP03043XL	HSTNN-LB8S	M01118-421	43	446872A1
112	WP03038XL	HSTNN-LB8W	M64305-421	38	564975A1
113	WP03051XL	HSTNN-LB8V	M64304-421	51	566075A1
114	HW03041XL	HSTNN-LB9A	L96887-422	41	P515974A1
115	EV06047	HSTNN-LB72	462890-421 462890-422	47	18650 S3
116	FO02037XL	HSTNN-LB9B	L97353-421	37	3674C0C1
117	WP03051XL	HSTNN-LB9C	M64304-422	51	566075A1
118	RH03051XL	HSTNN-LB9D	M64307-421	51	566075A1

MATERIAL SAFETY DATA SHEET

Lithium-Ion Battery

LG Energy Solution, Ltd.

1. Chemical Product and Company Identification

Product Identification

Lithium-Ion Battery (All models manufactured by LG Energy Solution, Ltd)

Manufacturer

LG Energy Solution, LTD.

Tower1, 108, Yeoui-daero, Yeongdeungpo-gu,

Seoul,

Rep. of KOREA

Emergency Telephone Number

82-3773-1114

Composition Information

Battery Constituents in Percentage									
Lithium ion Batter Composition	Lead (Pb)	Zinc(Zn)	Lithium(Li)	Nickel(Ni)	Iron(Fe)	Manganese(Mn)	Cobalt(Co)	Cadmium(Cd)	Plastic PE Other Material or Metals Graphite (Gr)
	< 0.00016%	< 1%	1 – 5%	0 – 15%	0 – 5%	0 – 10%	25 – 47%	0	1 – 10% 17 – 27%

Hazardous Ingredients	%	CAS Number
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

2. Hazards Identification

Emergency Overview

May explode in a fire, which could release hydrogen fluoride gas.

Use extinguishing media suitable for materials burning in fire.

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

3. 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.

4. 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.

5. 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.

6. Handling and Storage

Handling

No special protective clothing required for handling individual cells.

Storage

Store in a cool, dry place.

7. 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.

8. 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

9. 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.

10. 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.

11. Ecological Information

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

12. Disposal Considerations

California regulated debris

RCRA Waste Code : Nonregulated

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

13. 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 (2023 IATA 64th) Dangerous Goods Regulations
- The International Maritime Dangerous Goods (IMDG) Code with special provision 188.
- 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 latest edition of the IATA Dangerous Goods Regulations Section

II of either Packing Instruction 965 or 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;

14. 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 **64**th Edition Effective 1 January **2023**.

Hazardous ☒ Non-hazardous

15. 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/Amend.2)