Lithium-ion Rechargeable Battery Pack

LG Chem, Ltd.

MSDS for Dell Batteries.

- **History**

Version.	Items	Description	Date
V01	Origin	Initial Release	2011.04.05
V57	Reversion	For 2017	2017.01.04
V58	Update		2017.03.02
V60	Update	Add Turis MLK	2017.11.03
V61	Update	Add Whitehaven	2017.12.06
V62	Update	For Iata 59th	2018.01.10
V63	Update	Add Vancouver	2018.02.08
V64	Update	Add project Marketing Name	2018.03.16
V65	Update	Add Orion4C	2018.06.07
V66	Update	Add Spyglass, Northbay, Merion project	2018.06.27
V67	Update	Update Dell requested format	2018.10.08
V68	Update	Add Brook Hollow, Forest creek	2018.10.11
V69	Update	Add Mantis	2018.12.06
V70	Update	Add Pinehill MLK, Modena, Olympic, Riverside & IATA 60th	2019.07.25
V71	Update	Add Hela	2019.11.20
V72	Update	Add Spyglass MLK	2020.01.07

The Attached SDS, accurately represents the chemical construction, of the Dell Batteries listed below.

No.	Dell Part Number	Dell Type Number	Capacity	Rated voltage
1	N4TXM/ WNJ9J	XX1D1	36Wh	11.1V
2	V0XTF	TKN25	49Wh	11.1V
3	49VTP	MR90Y	65Wh	11.1V
4	0MF69	MR90Y	65Wh	14.8V
5	T1G4M	XCMRD	40Wh	14.8V
6	4KFGD	N3X1D	65Wh	11.1V
7	5DN1K	71R31	97Wh	11.1V
8	FT6D9	VJXMC	40Wh	14.8V
9	NVWGM	VV0NF	65Wh	11.1V
10	Y6KM7	N5YH9	97Wh	11.1V
11	Y9HNT	GVD76	31Wh	11.1V
12	KR71X	PFXCR	34Wh	11.1V
13	J31N7	WD52H	45Wh	7.4V
14	0D47W	34GKR	47Wh	7.4V
15	6MYFW	DGGGT	40Wh	7.4V
16	FT6D9	VJXMC	40Wh	14.8V
17	NVWGM	VV0NF	65Wh	11.1V
18	Y6KM7	N5YH9	97Wh	11.1V
19	G4YJM	F7HVR	58Wh	14.8V
20	V3D9R	7NXVR		7.4V
21	CFC6C	7WMM7	28Wh	7.4V
22	PWM3D/TPVWW	5MTD8	43Wh	7.4V
23	3NG29/W7KJC	YFDF9	65wh	11.1V
24	1V2F6	TRHFF	43Wh	11.1V
25	DFVYN	0PD19	58Wh	7.4V
26	0WF28	GK5KY	43Wh	11.1V
27	9P4D2	RYXXH	38Wh	11.1V
28	8V5GX	G5M10	51Wh	7.4V
29	WG6RP	F3G33	39Wh	11.1V
30	W57CV	VFV59	52Wh	7.4V
31	GV7HC	V8XN3	40Wh	11.1V
32	G95J5	3RNFD	54Wh	7.4V

33	HFRC3	2H2G4	38Wh	7.4V
34	FRVYX	TM9HP	20Wh	7.4V
35	YX81V	271J9	20Wh	11.1V
36	2P9KD	3V806	51Wh	14.8V
37	VTDT2	VMYGJ	58Wh	14.8V
38	991XP	M5Y1X	40Wh	14.8v
39	RTC77	K185W	47Wh	14.8V
40	FP02G	JD33K	28Wh	7.4V
41	70K80/7VJMH	T40JJ	1.8Wh	3.7V
42	H132V	T40JJ	1.8Wh	3.7V
43	M9XPM	T40JJ	1.8Wh	3.7V
44	KTCCN	5R9DD	43Wh	11.1V
45	WTG3T	R0TMP	62Wh	7.6V
46	5PD40	K81RP	21Wh	3.7V
47	242WD	J60J5	54Wh	7.6V
48	1V0PP	T05W1	72Wh	11.4V
49	RDYCT	MFKVP	89Wh	11.4V
50	RDRH9	NGGX5	47Wh	11.4V
51	G9G1H	WJ5R2	81Wh	11.4V
52	92NCT	GK5KY	43Wh	11.1V
53	2VMGK	N1WM4	62Wh	15.2V
54	62MJV	RRCGW	56Wh	11.4V
55	V55D0	7VKV9	30W	7.6V
56	VXT50	9KY50	19W	15.2V
57	HK6DV	6MT4T	62Wh	7.6V
58	2VMGK	N1WM4	62Wh	15.2V
59	K5NN2	YFDF9	65wh	11.1V
60	PKG3N	1MCXM	28wh	7.6V
61	5K9CP	90V7W	56Wh	7.6V
62	K5NN2	GK5KY	43Wh	11.1V
63	9JF93	TRHFF	43Wh	11.1V
64	HMNKM	0PD19	58Wh	7.6V
65	5PYY9	RYXXH	38Wh	11.4V
66	K9GVN	G5M10	51Wh	7.6V
67	4H34M	P63NY	43Wh	7.6V
68	HMYXT/2P6GX	T54FJ	60Wh	11.1V
69	GK2X6	J1KND	48Wh	11.1V
70	T2JX4	WDX0R	42Wh	11.4V

71	81PF3	33YDH	56Wh	15.2V
72	H1391	W1193	60Wh	11.1V
73	TVMVN/PFW7V	T54FJ	60Wh	11.1V
74	T453X	4GVGH	84Wh	11.4V
75	JNT6D	5R9DD	58Wh	11.4V
76	05VFW/9981K	NHXVW	87Wh	11.1V
77	RNP72	PW23Y	60Wh	7.6V
78	NP0V3	NNF1C	46Wh	7.6V
79	4RRR3	TDW5P	76Wh	15.2V
80	DWJHM	VFV59	52Wh	7.4V
81	CJW7D	3RNFD	54Wh	7.4V
82	96H67	Y2RV2	3.4Wh	3.8V
84	M6WKR	PWKWM	56Wh	15.2V
85	5JT8G	1WND8	31.5Wh	11.4V
86	X16TW	J0PGR	42Wh	15.2V
87	546FF	44T2R	68Wh	15.2V
88	01D82	9NJM1	99Wh	11.4V
89	NJJ2H	J60J5	54Wh	7.6V
90	J8FXW	6MT4T	62Wh	7.6V
91	C27RW	DJ1J0	42Wh	11.4V
92	2X39G	F3YGT	60Wh	7.6V
93	MYJ96	F3YGT	60Wh	7.6V
94	5D91C	H5H20	56Wh	11.4V
95	5XJ28	6GTPY	97Wh	11.4V
96	96H67	Y2RV2	3.5Wh	3.8V
97	3VC9Y	3DDDG	42Wh	11.4V
98	83XPC	93FTF	51Wh	11.4V
99	DV9NT	GJKNX	68Wh	7.6V
100	FPT1C	GJKNX	68Wh	7.6V
101	NY5PG	VG93N	92Wh	11.4V
102	FTG78	J0PGR	42Wh	15.2V
103	725KY	K5XWW	60Wh	7.6V
104	CFX97	71TG4	45Wh	11.4V
105	V57XN/YCNCW	M5Y0X	97Wh	11.1V
106	J7KGM/3CVD9	M5Y0X	97Wh	11.1V
107	8PGNG	JWPHF	57Wh	11.1V
108	P27T3	R795X	84Wh	11.1V
109	6K0DT	H7XW1	44WH	14.8V

110	YKF0M	8858X	48Wh	11.1V
111	X28XH	X284G	48Wh	11.1V
112	3N73J	GW240	32Wh	14.8V
113	KCFPM	TKV2V	48Wh	11.1V
114	H1391/ 3XY6Y	W1193	62Wh	11.1V
115	8TJD2/ 9X6X0	W1193	62Wh	11.1V
116	9GXD5/ CWTM0	RFJMW	97Wh	11.1V
117	6CYH6	K5XWW	60Wh	7.6V
118	Y07HK	51KD7	42Wh	11.4V
119	C07K7	WJ5R2	81Wh	11.4V
120	MN791	271J9	20Wh	11.4V
121	R89JJ	TM9HP	20Wh	7.6V
122	242WD	J60J5	54Wh	7.6V
123	K5NN2	YFDF9	65wh	11.4V
124	0C178	NGGX5	47Wh	11.4V
125	0D074	6MT4T	62Wh	7.6V
126	K1G3K	WJ5R2	81Wh	11.4V
127	4RRR3	TDW5P	76Wh	15.2V
128	546FF	44T2R	68Wh	15.2V
129	6CYH6	K5XWW	60Wh	7.6V
130	8YPRW	WDX0R	42Wh	11.4V
131	99NF2	33YDH	56Wh	15.2V
132	5JT8G	1WND8	31.5Wh	11.4V
133	X16TW	J0PGR	42Wh	15.2V
134	FTG78	J0PGR	42Wh	15.2V
135	Y07HK	51KD7	42Wh	11.4V
136	1GGDK	33YDH	56Wh	15.4V
137	8YPRW	WDX0R	42Wh	11.4V
138	99NF2	33YDH	56Wh	15.4V
139	H754V	DXGH8	52Wh	7.6V
140	V5MHM	8N0T7	75Wh	11.4V
141	7PY0D	M5Y1K	40Wh	15.2V
142	H6K6V	5TF10	64Wh	7.6V
143	7M0T6	NYFJH	97Wh	11.4V
144	FY2VW	NYFJH	97Wh	11.4V
145	GK3D3/6NNCF	7WNW1	51Wh	11.4V

146	FDRHM	YRDD6	42Wh	11.4V
147	8622M	1F22N	60Wh	15.2V
148	8W3YY	NF2MW	52Wh	7.6V
149	C7P81	NF2MW	52Wh	7.6V
150	C76H7	7146W	78Wh	11.4V
151	XV8CJ	1V1XF	42Wh	11.4V
152	49HG8	R8D7N	51Wh	11.4V
153	X77XY	4GVMP	68Wh	7.6V
154	5H46R	4GVMP	68Wh	7.6V
155	3KF82	0G74G	42Wh	11.4V
156	829MX	MXV9V	60Wh	7.6V
157	CR8V9	MXV9V	60Wh	7.6V
158	10X1J/3YNXM	3HWPP	68Wh	15.2V
159	1WJT0	1FXDH	97Wh	11.4V
160	07GDY	JPFMR	42Wh	11.4V
161	415CG	266J9	51Wh	11.4V
161	9P3NW/G4MX4	4WN0Y	56Wh	15.2V
162	2XXFW	722KK	52Wh	7.6V
163	8NFC7	N7HT0	52Wh	7.6V
164	09YYF	35J09	39Wh	11.4V
165	4V5X2/YY3GJ	JHT2H	52Wh	7.6V
166	TJDRR	V0GMT	56Wh	11.4V
167	9TM7D	4K1VM	97Wh	11.4V
168	11P1P	NF2MW	52Wh	7.6V
169	8RTVG	7146W	78Wh	11.4V

Signed by Representative: 

MATERIAL SAFETY DATA SHEET

Lithium-Ion Battery

LG Chem, Ltd.

1. Chemical Product and Company Identification

Product Identification

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

Manufacturer

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

Emergency Telephone Number

82-80-005-4000

2. Composition Information

Hazardous Ingredients	%	CAS Number
Aluminum Foil	2-10	7429-90-5
Metal Oxide (proprietary)	20-50	12190-79-3
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	21324-40-3
Stainless steel, Nickel and inert materials	<5	7440-02-0

3. 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

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℃, 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 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 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;

This product passed 1.2M drop test and comply with UN38.3.

No.	Test Item	Criteria	Result
Test 1	Altitude simulation	- After OCV (%) ≥ 90% - No leakage, no venting, no disassembly, no rupture, no fire - Mass loss limit (leakage) 1) If M<1g, less than 0.5%, 2) If 1g≤M≤75g, less than 0.2%, 3) If M>75g, less than 0.1%)	Pass
Test 2	Thermal test		Pass
Test 3	Vibration		Pass
Test 4	Shock		Pass
Test 5	External short circuit	- No disassembly, no rupture, no fire within 6 hours after the test - Max. Temp ≤ 170℃	Pass
Test 6	Impact or Crush	- No disassembly, no fire within 6 hours after the test - Max. Temp ≤ 170℃	Pass
Test 7	Overcharge	- No disassembly, no fire within 7 days after the test	Pass
Test 8	Forced discharge	- No disassembly, no fire within 7 days after the test	Pass

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 60th Edition Effective 1 January 2019.

_____Hazardous ____✔Non-hazardous

16. Other Information

NA

Global Product Compliance Engineering & Environmental Affairs
One Dell Way (PS4 30)
Round Rock, TX 78682

Safety Data Sheet – Appendix A

Subject: Amendment to original SDS prepared by the manufacturer

Section 1. Identification

In addition to the information in **1. Identification** section of the original manufacturer prepared SDS, the following information also applies for Dell products:

Supplier's Details

Supplier's Details	Dell Inc. One Dell Way Round Rock, TX 78682	For Australia only Supplier's Details	Dell Australia Pty Limited Building 3 14 Acquatic Drive French's Forest Sydney, NSW Postcode 2086 +(61) 2 8223 9403
Emergency telephone number	CHEMTREC North America 800-424-9300 International 1-703-527-3887	Australia Emergency Telephone number	CHEMTREC Australia (Sydney) +(61) 2 90372994
Prepared by	Global Product Compliance, Dell Inc.		