SAFETY DATA SHEET

HCS-2012 APPENDIX D TO §1910.1200

Version 1 **Issue Date** 23-May-2017
Product Name Lithium Ion Battery **Revision date** 23-May-2017

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier

Product Name	Lithium Ion Battery

Other means of identification

NCM18650-220 3.6V 2200mAh
Watt-Hour: 7.92
Weight: 43g

Recommended use of the chemical and restrictions on use

Recommended Use	Battery, power supply.
Uses advised against	No information available.

Details of the supplier of the safety data sheet

Supplier	DLG (Shanghai) Electronic Technology Co., LTD
Address	No.3492 Jinqian Road, Fengxian District, Shanghai, China
Postal Code	201406
Phone	+86-21-57475830
E-mail	zhengyang_liu@dlgbattery.cn

Emergency telephone number

+86-21-57475830

2. HAZARDS IDENTIFICATION

GHS Classification

Not classified

Label elements

Symbols/Pictograms	None
Signal word	None
Hazard Statements	Not applicable
Precautionary Statements	
Prevention	Not applicable
Response	Not applicable
Storage	Not applicable
Disposal	Not applicable

Hazards not otherwise classified (HNOC)

No information available.

Unknown acute toxicity

No information available.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature Article

Chemical Name	CAS No	Weight-%
Cobalt lithium manganese nickel oxide	182442-95-1	30-45
Graphite Powder	7440-44-0	15-25
Copper foil	7440-50-8	5-10
Aluminum foil	7429-90-5	2-8
Nickel	7440-02-0	0.5-5
Lithium hexaflurorphosphate (LiPF6)	21324-40-3	1-3
Carbon black	1333-86-4	0.5-2
Poly (vinylidene fluoride)	24937-79-9	0.1-2

4. FIRST AID MEASURES

Description of first aid measures

General advice — In case of accident or unwellness, seek medical advice immediately.
Inhalation — Not an expected route of exposure.
Skin Contact — No special technical protective measures are necessary.
Eye contact — No special technical protective measures are necessary.
Ingestion — Not an expected route of exposure.

Most important symptoms and effects, both acute and delayed

No information available.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media — Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media — No information available.

Specific hazards arising from the chemical

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Evacuate personnel to safe areas. Remove all sources of ignition. Ensure adequate ventilation, especially in confined areas. Take precautionary measures against static discharges.

Methods and material for containment and cleaning up

Take up mechanically, placing in appropriate containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Handle in accordance with good industrial hygiene and safety practice. Ensure adequate ventilation, especially in confined areas. Wash thoroughly after handling. Take precautionary measures against static discharges.

Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat. Store in accordance with local regulations.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH	Denmark	European Union
Cobalt lithium manganese nickel oxide (CAS #: 182442-95-1)	TWA: 0.02 mg/m^3 Co TWA: 0.02 mg/m^3 Mn TWA: 0.1 mg/m^3 Mn	-	IDLH: 500 mg/m^3 Mn IDLH: 10 mg/m^3 Ni TWA: 1 mg/m^3 Mn TWA: 0.015 mg/m^3 except Nickel carbonyl Ni STEL: 3 mg/m^3 Mn	TWA: 0.01 mg/m^3 TWA: 0.2 mg/m^3	-
Copper foil (CAS #: 7440-50-8)	TWA: 0.2 mg/m^3 fume TWA: 1 mg/m^3 Cu dust and mist	-	IDLH: 100 mg/m^3 dust, fume and mist IDLH: 100 mg/m^3 Cu dust and mist TWA: 1 mg/m^3 dust and mist TWA: 0.1 mg/m^3 fume TWA: 1 mg/m^3 Cu dust and mist	TWA: 1.0 mg/m^3 TWA: 0.1 mg/m^3	-
Aluminum foil (CAS #: 7429-90-5)	TWA: 1 mg/m^3 respirable fraction	TWA: 15 mg/m^3 total dust TWA: 5 mg/m^3 respirable fraction (vacated) TWA: 15 mg/m^3 total dust (vacated) TWA: 5 mg/m^3 respirable fraction (vacated) TWA: 5 mg/m^3 Al Aluminum	TWA: 10 mg/m^3 total dust TWA: 5 mg/m^3 respirable dust TWA: 5 mg/m^3 Al	TWA: 5 mg/m^3 TWA: 2 mg/m^3	-
Nickel (CAS #: 7440-02-0)	TWA: 1.5 mg/m^3 inhalable fraction	TWA: 1 mg/m^3 (vacated) TWA: 1 mg/m^3	IDLH: 10 mg/m^3 IDLH: 10 mg/m^3 Ni TWA: 0.015 mg/m^3 TWA: 0.015 mg/m^3 except Nickel carbonyl Ni	TWA: 0.05 mg/m^3	-

Lithium hexaflurorphosphate (LiPF6) (CAS #: 21324-40-3)	TWA: 2.5 mg/m^3 F	-	-	TWA: 2.5 mg/m^3	-
Carbon black (CAS #: 1333-86-4)	TWA: 3 mg/m^3 inhalable fraction	-	IDLH: 1750 mg/m^3 TWA: 3.5 mg/m^3 TWA: 0.1 mg/m^3 Carbon black in presence of Polycyclic aromatic hydrocarbons PAH	TWA: 3.5 mg/m^3	-

Chemical Name	Latvia	France	Finland	Germany	Italy
Cobalt lithium manganese nickel oxide (CAS #: 182442-95-1)	TWA: 0.05 mg/m^3	-	TWA: 0.05 mg/m^3 TWA: 0.01 mg/m^3 TWA: 0.02 mg/m^3 TWA: 0.2 mg/m^3	TWA: 0.2 mg/m^3 TWA: 0.02 mg/m^3 Ceiling / Peak: 1.6 mg/m^3 Ceiling / Peak: 0.16 mg/m^3 Ceiling / Peak: 0.2 mg/m^3 Skin TWA: 0.5 mg/m^3	-
Copper foil (CAS #: 7440-50-8)	TWA: 0.5 mg/m^3 STEL: 1 mg/m^3	TWA: 0.2 mg/m^3 TWA: 1 mg/m^3 STEL: 2 mg/m^3	TWA: 1 mg/m^3 TWA: 0.1 mg/m^3	TWA: 0.01 mg/m^3 Ceiling / Peak: 0.02 mg/m^3 Ceiling / Peak: 0.2 mg/m^3	-
Aluminum foil (CAS #: 7429-90-5)	TWA: 2 mg/m^3	TWA: 10 mg/m^3 TWA: 5 mg/m^3	TWA: 1.5 mg/m^3	TWA: 4 mg/m^3 TWA: 1.5 mg/m^3	-
Nickel (CAS #: 7440-02-0)	TWA: 0.05 mg/m^3	TWA: 1 mg/m^3	TWA: 1 mg/m^3 TWA: 0.1 mg/m^3	Skin	-
Lithium hexaflurorphosphate (LiPF6) (CAS #: 21324-40-3)		-	-	TWA: 1 mg/m^3 Skin	-
Carbon black (CAS #: 1333-86-4)		TWA: 3.5 mg/m^3	TWA: 3.5 mg/m^3 STEL: 7 mg/m^3	Skin	-

Chemical Name	Poland	Portugal	Spain	Switzerland	Netherlands
Copper foil (CAS #: 7440-50-8)	-	-	-	-	TWA: 0.1 mg/m^3
Aluminum foil (CAS #: 7429-90-5)	TWA: 2.5 mg/m^3 TWA: 1.2 mg/m^3	TWA: 10 mg/m^3 TWA: 5 mg/m^3	TWA: 10 mg/m^3 TWA: 5 mg/m^3	TWA: 3 mg/m^3	-
Nickel (CAS #: 7440-02-0)	TWA: 0.25 mg/m^3	TWA: 1.5 mg/m^3	TWA: 1 mg/m^3	TWA: 0.5 mg/m^3	-

Chemical Name	Norway	United Kingdom	Australia	Austria	Belgium
Cobalt lithium manganese nickel oxide (CAS #: 182442-95-1)	TWA: 0.05 mg/m^3 TWA: 0.02 mg/m^3 TWA: 1 mg/m^3 TWA: 0.1 mg/m^3 STEL: 0.05 mg/m^3 STEL: 0.02 mg/m^3 STEL: 1 ppm STEL: 0.1 mg/m^3	-	1 mg/m^3	Skin STEL 2 mg/m^3 TWA: 0.5 mg/m^3	-
Graphite Powder (CAS #: 7440-44-0)	-	-	-	TWA: 5 mg/m^3	-
Copper foil (CAS #: 7440-50-8)	TWA: 0.1 mg/m^3 TWA: 1 mg/m^3 STEL: 0.1 mg/m^3 STEL: 1 mg/m^3	-	1 mg/m^3 0.2 mg/m^3	STEL 4 mg/m^3 STEL 0.4 mg/m^3 TWA: 1 mg/m^3 TWA: 0.1 mg/m^3	-

Aluminum foil (CAS #: 7429-90-5)	TWA: 5 mg/m^3 STEL: 5 mg/m^3	STEL: 30 mg/m^3 STEL: 12 mg/m^3 TWA: 10 mg/m^3 TWA: 4 mg/m^3	10 mg/m^3 5 mg/m^3	STEL 20 mg/m^3 TWA: 10 mg/m^3	-
Nickel (CAS #: 7440-02-0)	TWA: 0.05 mg/m^3 STEL: 0.05 mg/m^3	STEL: 1.5 mg/m^3 TWA: 0.5 mg/m^3	1 mg/m^3	-	-
Lithium hexaflurorphosphate (LiPF6) (CAS #: 21324-40-3)	-	-	2.5 mg/m^3	-	-
Carbon black (CAS #: 1333-86-4)	TWA: 3.5 mg/m^3 STEL: 3.5 mg/m^3	-	3 mg/m^3	-	-

Appropriate engineering controls

Use with local exhaust ventilation.

Individual protection measures, such as personal protective equipment

Respiratory protection	If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn..
Hand Protection	Wear protective gloves.
Eye/face protection	Wear safety glasses with side shields (or goggles).
Skin and body protection	Wear suitable protective clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Solid
Color	Not determined
Odor	Not determined
Odor Threshold	Not determined
pH	Not determined
Melting point/freezing point	Not determined
Boiling point / boiling range	Not determined
Flash point	Not determined
Evaporation rate	Not determined
Flammability (solid, gas)	Not determined
Flammability Limit in Air	Not determined
Vapor Pressure	Not determined
Vapor density	Not determined
Density	Not determined
Partition coefficient (LogPow)	Not determined
Autoignition temperature	Not determined
Decomposition temperature	Not determined
Kinematic viscosity	Not determined
Dynamic viscosity	Not determined
Explosive properties	Not an explosive
Oxidizing properties	Not determined

Other information

No information available

10. STABILITY AND REACTIVITY

Reactivity

No known effects under normal use conditions.

Chemical stability

Stable under normal conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to avoid

Extremes of temperature and direct sunlight.

Incompatible materials

Strong acids. Strong bases. Strong oxidizing agents.

Hazardous Decomposition Products

None under normal use conditions

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Inhalation	No known effect based on information supplied.
Eye contact	No known effect based on information supplied.
Skin Contact	No known effect based on information supplied.
Ingestion	No known effect based on information supplied.

Information on toxicological effects

Acute toxicity

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Graphite Powder (CAS #: 7440-44-0)	> 10000 mg/kg (Rat)	-	-
Copper foil (CAS #: 7440-50-8)	> 2500 mg/kg bw(rat)	> 2000 mg/kg bw(rat)	=1.03 mg/L/4 h(rat)
Nickel (CAS #: 7440-02-0)	> 9000 mg/kg (Rat)	-	-
Carbon black (CAS #: 1333-86-4)	> 8000 mg/kg (rat)	> 3000 mg/kg (Rabbit)	-

Skin corrosion/irritation

Non-irritating to the skin.

Serious eye damage/eye irritation

No eye irritation.

Sensitization

No information available.

Germ cell mutagenicity

No information available.

Carcinogenicity

Chemical Name	ACGIH	IARC	NTP	OSHA
Nickel (CAS #: 7440-02-0)	-	Group 2B	Reasonably Anticipated	X
Carbon black (CAS #: 1333-86-4)	A3	Group 2B	-	-

Reproductive toxicity
No information available.

STOT - single exposure
No information available.

STOT - repeated exposure
No information available.

Aspiration hazard
No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Chemical Name	Algae/aquatic plants EC50	Fish LC50	Crustacea EC50
Copper foil (CAS #: 7440-50-8)	0.031 - 0.054 mg/L/96h Pseudokirchneriella subcapitata static 0.0426 - 0.0535 mg/L/72h Pseudokirchneriella subcapitata static	1.25: 96 h Lepomis macrochirus mg/L LC50 static 0.3: 96 h Cyprinus carpio mg/L LC50 semi-static 0.8: 96 h Cyprinus carpio mg/L LC50 static 0.112: 96 h Poecilia reticulata mg/L LC50 flow-through 0.0068 - 0.0156: 96 h Pimephales promelas mg/L LC50 0.3: 96 h Pimephales promelas mg/L LC50 static 0.2: 96 h Pimephales promelas mg/L LC50 flow-through 0.052: 96 h Oncorhynchus mykiss mg/L LC50 flow-through	-
Nickel (CAS #: 7440-02-0)	0.18 mg/L/72h Pseudokirchneriella subcapitata 0.174 - 0.311 mg/L/96h Pseudokirchneriella subcapitata static	100 mg/L/96h Brachydanio rerio 1.3 mg/L/96h Cyprinus carpio semi-static 10.4 mg/L/96h Cyprinus carpio static	100 mg/L/48h Daphnia magna 1 mg/L/48h Daphnia magna Static

Persistence and degradability
No information available.

Bioaccumulative potential
No information available.

Mobility in soil

No information available.

Other adverse effects

No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal of wastes	Disposal should be in accordance with applicable regional, national and local laws and regulations.
Contaminated packaging	Dispose of in accordance with federal, state and local regulations.

14. TRANSPORT INFORMATION

DOT

UN/ID No.	Not regulated
UN Proper shipping name	Not regulated
Hazard Class	Not regulated
Packing Group	Not regulated
Special precautions	No information available
Marine pollutant	Not marine pollutant

IMDG

UN/ID No.	Not regulated
UN Proper shipping name	Not regulated
Hazard Class	Not regulated
Packing Group	Not regulated
Hazards Identification	None
Suggestion according to IMO IMDG Code	The article is not restricted to IMO IMDG Code according to special provision 188.
Packaging requirements	None

IATA

UN/ID No.	UN3480
UN Proper shipping name	Not regulated
Hazard Class	Not regulated
Packing Group	PI965
Hazards Identification	Lithium ion battery
Suggestion according to IATA DGR	The goods are meet the requirements in General Requirements and section II of Packaging Instruction 965.
Packaging requirements	The goods are packaged according to the Packaging Instruction 965 section II.

15. REGULATORY INFORMATION

International Inventories

Component	AICS	DSL/NDSL	EINECS/ELINCS	ENCS	IECSC	KECL	PICCS	TSCA

Cobalt lithium manganese nickel oxide 182442-95-1	-	-	-	-	X	-	-	X
Graphite Powder 7440-44-0	X	X	X	-	X	X	X	X
Copper foil 7440-50-8	X	X	X	-	X	X	X	X
Aluminum foil 7429-90-5	X	X	X	-	X	X	X	X
Nickel 7440-02-0	X	X	X	-	X	X	X	X
Lithium hexaflurorphosphate (LiPF6) 21324-40-3	X	X	X	X	X	X	X	X
Carbon black 1333-86-4	X	X	X	X	X	X	X	X
Poly (vinylidene fluoride) 24937-79-9	X	X	-	X	X	X	X	X

"-" Not Listed
"X" Listed

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical Name	SARA 313 - Threshold Values %
Aluminum foil - 7429-90-5	1.0
Nickel - 7440-02-0	0.1

SARA 311/312 Hazard Categories

Not applicable

CWA (Clean Water Act)

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Cobalt lithium manganese nickel oxide 182442-95-1	-	X	-	-
Copper foil 7440-50-8	-	X	X	-
Nickel 7440-02-0	-	X	X	-

CERCLA

Not applicable

Chemical Name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Nickel 7440-02-0	100 lb	-	RQ 100 lb final RQ RQ 45.4 kg final RQ

US State Regulations

California Proposition 65

This product contains the following Proposition 65 chemicals

Chemical Name	California Proposition 65
Cobalt lithium manganese nickel oxide - 182442-95-1	Carcinogen
Nickel - 7440-02-0	Carcinogen
Carbon black - 1333-86-4	Carcinogen

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Cobalt lithium manganese nickel oxide 182442-95-1	X	-	-
Copper foil 7440-50-8	X	X	-
Aluminum foil 7429-90-5	X	X	X
Nickel 7440-02-0	X	X	X
Lithium hexaflurorphosphate (LiPF6) 21324-40-3	X	-	-
Carbon black 1333-86-4	X	X	-

16. OTHER INFORMATION

Revision Note

Issue Date	23-May-2017
Revision date	23-May-2017
Revision Note	Not applicable

Key or legend to abbreviations and acronyms used in the safety data sheet

TWA - TWA (time-weighted average)
STEL - STEL (Short Term Exposure Limit)
Ceiling - Maximum limit value
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances

Disclaimer

The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

-------- End of Safety Data Sheet --------