SAFETY DATA SHEET

MOTOROLA SOLUTIONS

1. Identification

Product identifier **Lithium-ion and Lithium-ion Polymer Batteries (Li-ion Batteries)**

Other means of identification None.

Recommended use Lithium-ion battery.

Recommended restrictions None known.

Manufacturer / Importer / Supplier / Distributor information

Company Name Motorola Solutions, Inc.

Address 2000 Progress Parkway
Schaumburg, Illinois 60196 U.S.A.

General information 1-847-576-5000

Emergency phone number

CHEMTREC 1-800-424-9300 (U.S.) or +1-703-527-3887 for international incidents.

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards

Acute toxicity, oral	Category 4
Skin corrosion/irritation	Category 1B
Serious eye damage/eye irritation	Category 1
Sensitization, skin	Category 1
Carcinogenicity	Category 1A

OSHA defined hazards Not classified.

Under normal conditions of processing and use, exposure to the chemical constituents in this product is unlikely. The battery should not be opened or burned. Exposure to the ingredients contained within or their combustion products could be harmful. Hazards shown here apply to exposure that may occur from damaged or leaking batteries or under extreme heat conditions such as fire.

Label elements

Signal word Danger

Hazard statement Harmful if swallowed. Causes severe skin burns and eye damage. May cause an allergic skin reaction. May cause cancer.

Precautionary statement

Prevention Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid breathing fume/mist/vapors/spray. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Contaminated work clothing must not be allowed out of the workplace. Wear protective gloves/protective clothing/eye protection/face protection.

Response If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. If skin irritation or rash occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

Storage Store locked up.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information None.

3. Composition / information on ingredients

Mixtures

Chemical name	CAS number	%
Positive electrode (One of the following: Lithiated cobalt oxides, Lithiated manganese oxides, Lithiated nickel-manganese-cobalt oxides)	12190-79-3, 12057-17-9, 346417-97-8	20-50
Negative electrode (Graphite)	7782-42-5	10-20
Binders (Polyvinylidene difluoride and/or polytetrafluoroethylene)	24937-79-9, 9002-84-0	0-3
Electrolyte salt (Lithium salt: one or more of lithium hexafluorophosphate and lithium tetrafluoroborate)	21324-40-3, 14283-07-9	1-5
Electrolyte solvent (Organic solvents including one or more of the following: Ethylene carbonate, Diethyl carbonate, Dimethyl carbonate, Ethyl methyl carbonate, and Propylene carbonate.)	96-49-1, 105-58-8, 616-38-6, 623-53-0, 108-32-7	5-20
Other components (Copper)	7440-50-8	5-14
Other components (Aluminum)	7429-90-5	5-40
Other components (Nickel)	7440-02-0	0-5
Other components (Polyethylene and/or polypropylene)	9002-88-4, 9003-07-0	0-3

All concentrations are in percent by weight unless otherwise indicated.

Ingredients shown are major constituents representative of various compositions for lithium-ion cells.

Exposure to hazardous ingredients is not anticipated under normal conditions of use. For further information, please refer to Section 8.

4. First-aid measures

Inhalation Exposure to contents of an open or damaged battery: If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Call a physician or poison control center immediately.

Skin contact Exposure to contents of an open or damaged battery: Remove contaminated clothes and rinse skin thoroughly with water for at least 15 minutes. Call a physician or poison control center immediately. Chemical burns must be treated by a physician.

Eye contact Exposure to contents of an open or damaged battery: Immediately flush eyes with plenty of water for at least 15 minutes. Provide eyewash station. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.

Ingestion Exposure to contents of an open or damaged battery: Call a physician or poison control center immediately. Rinse mouth. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

Most important symptoms/effects, acute and delayed Exposure to contents of an open or damaged battery: Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause allergic skin reaction. Difficulty in breathing. Coughing. Prolonged exposure may cause chronic effects.

Indication of immediate medical attention and special treatment needed Provide general supportive measures and treat symptomatically. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

General information	IF exposed or concerned: Get medical advice/attention. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before reuse.

5. Firefighting measures

Suitable extinguishing media	Use fire-extinguishing media appropriate for surrounding materials.
Unsuitable extinguishing media	Leak from a damaged or opened battery: Do not use water unless flooding amounts are available.
Specific hazards arising from the chemical	In the event of fire and/or explosion do not breathe fumes. The evolved combustion products may contain carbon oxides, metal oxides, hydrogen fluoride, and should be considered hazardous.
Special protective equipment and precautions for firefighters	Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.
Firefighting equipment/instructions	Fight fire from protected location or safe distance. Keep upwind. Move containers from fire area if you can do so without risk. Avoid discharge into drains, water courses or onto the ground.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	Under normal use, the battery does not exhibit flammable properties. In the event that the battery is abused and disassembly of the battery occurs resulting in exposure of internal components, the exposed solution, may be flammable and/or corrosive. Exposure to excessive heat may lead to venting or rupture of the sealed battery, exposing the internal components which may be corrosive and/or flammable. Vented gas would be flammable when in sufficient concentration.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	None under normal use conditions. In the event of damage resulting in a leak or exposed materials, avoid contact with contents of an open or damaged cell or battery. Wear protective clothing as described in Section 8 of this safety data sheet.
Methods and materials for containment and cleaning up	Leak from a damaged or opened battery: Contain spillage with sand or earth. Collect with absorbent, non-combustible material into suitable containers. For waste disposal, see Section 13 of the SDS.
Environmental precautions	Avoid allowing material from exposed battery to contaminate soil, sanitary sewers, or waterways.

7. Handling and storage

Precautions for safe handling	Do not open, disassemble, crush or burn battery. Protect against physical damage. Do not expose battery to extreme heat or fire. Do not allow conductive material to touch the battery terminals. A dangerous short-circuit may occur and cause battery failure and fire.
Conditions for safe storage, including any incompatibilities	Keep out of reach of children. Prevent short circuits. Store in original packaging. Store in a cool, dry, ventilated area away from sources of heat, moisture and incompatibilities. Store away from incompatible materials (See Section 10).

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value	Form
Aluminum (CAS 7429-90-5)	PEL	5 mg/m3	Respirable dust.
		15 mg/m3	Total dust.
COBALT LITHIUM NICKEL OXIDE (CAS 182442-95-1)	Ceiling	5 mg/m3	
Copper (CAS 7440-50-8)	PEL	1 mg/m3	Dust and mist.
		0.1 mg/m3	Fume.
Graphite (CAS 7782-42-5)	PEL	5 mg/m3	Respirable fraction.
		15 mg/m3	Total dust.
Lithium manganese oxide (CAS 12057-17-9)	Ceiling	5 mg/m3	
Nickel (CAS 7440-02-0)	PEL	1 mg/m3	

US. OSHA Table Z-3 (29 CFR 1910.1000)

Components	Type	Value
Graphite (CAS 7782-42-5)	TWA	15 mppcf

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Aluminum (CAS 7429-90-5)	TWA	1 mg/m3	Respirable fraction.
Cobalt lithium dioxide (CAS 12190-79-3)	TWA	0.02 mg/m3	
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Dust and mist.
		0.2 mg/m3	Fume.
Graphite (CAS 7782-42-5)	TWA	2 mg/m3	Respirable fraction.
Lithium manganese oxide (CAS 12057-17-9)	TWA	0.1 mg/m3	Inhalable fraction.
		0.02 mg/m3	Respirable fraction.
Lithium tetrafluoroborate, anhydrous (CAS 14283-07-9)	STEL	6 mg/m3	Inhalable fraction.
	TWA	2 mg/m3	Inhalable fraction.
Nickel (CAS 7440-02-0)	TWA	1.5 mg/m3	Inhalable fraction.

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value	Form
Aluminum (CAS 7429-90-5)	TWA	5 mg/m3	Welding fume or pyrophoric powder.
		5 mg/m3	Respirable.
		10 mg/m3	Total
COBALT LITHIUM NICKEL OXIDE (CAS 182442-95-1)	STEL	3 mg/m3	Fume.
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Dust and mist.
Graphite (CAS 7782-42-5)	TWA	2.5 mg/m3	Respirable.
Lithium manganese oxide (CAS 12057-17-9)	STEL	3 mg/m3	Fume.
	TWA	1 mg/m3	Fume.
Lithium tetrafluoroborate, anhydrous (CAS 14283-07-9)	TWA	2.5 mg/m3	
Nickel (CAS 7440-02-0)	TWA	0.015 mg/m3	

Biological limit values

ACGIH Biological Exposure Indices

Components	Value	Determinant	Specimen	Sampling Time
Cobalt lithium dioxide (CAS 12190-79-3)	15 µg/l	Cobalt	Urine	*
COBALT LITHIUM NICKEL OXIDE (CAS 182442-95-1)	15 µg/l	Cobalt	Urine	*

* - For sampling details, please see the source document.

Exposure guidelines Airborne exposures to hazardous substances are not expected when product is used for its intended purpose.

Appropriate engineering controls General ventilation normally adequate. Leak from a damaged or opened battery: Provide adequate ventilation if fumes or vapors are generated.

Individual protection measures, such as personal protective equipment

Eye/face protection None under normal conditions. Leak from a damaged or opened battery: Wear approved safety glasses or goggles.

Skin protection

Hand protection None under normal conditions. Leak from a damaged or opened battery: Wear protective gloves.

Skin protection

Other None under normal conditions. Leak from a damaged or opened battery: Wear suitable protective clothing and gloves.

Respiratory protection None under normal conditions. Leak from a damaged or opened battery: Wear NIOSH approved respirator.

Thermal hazards Not applicable.

General hygiene considerations Do not store food, drink and tobacco near the product. Practice good housekeeping.

9. Physical and chemical properties

Appearance

Physical state	Solid.
Form	Battery.
Color	Not available.
Odor	Not available.
Odor threshold	Not available.
pH	Not available.
Melting point/freezing point	Not available.
Initial boiling point and boiling range	Not available.
Flash point	Not available.
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.

Upper/lower flammability or explosive limits

Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Relative density	Not available.

Solubility(ies)

Solubility (water)	Not available.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.

Other information

Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Product is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	Contact with incompatible materials. Elevated temperatures. Shocks and physical damage. Do not open, disassemble, crush or burn battery. Do not allow conductive material to touch the battery terminals. A dangerous short-circuit may occur and cause battery failure and fire.
Incompatible materials	Do not immerse in seawater or other high conductivity liquids. Organic electrolyte - reacts with water to produce hydrogen fluoride.
Hazardous decomposition products	Thermal decomposition or combustion may produce: carbon oxides, metal oxides, hydrogen fluoride.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Not relevant, due to the form of the product. Exposure to contents of an open or damaged battery: May cause irritation to the respiratory system. Prolonged inhalation may be harmful.

Skin contact	Not relevant, due to the form of the product. Exposure to contents of an open or damaged battery: Causes severe skin burns. May cause an allergic skin reaction.
Eye contact	Not relevant, due to the form of the product. Exposure to contents of an open or damaged battery: Causes serious eye damage.
Ingestion	Not relevant, due to the form of the product. Exposure to contents of an open or damaged battery: Causes digestive tract burns. Harmful if swallowed.
Symptoms related to the physical, chemical and toxicological characteristics	Exposure not expected under normal use conditions. In the event that cell or battery is damaged, open, or leaking - inhalation, skin contact, and/or eye contact may be considered for routes of exposure. Signs and symptoms may include: Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause allergic skin reaction. Difficulty in breathing. Coughing. Prolonged exposure may cause chronic effects.

Information on toxicological effects

Acute toxicity	Expected to be a low hazard for usual industrial or commercial handling by trained personnel. Exposure to contents of an open or damaged battery: Harmful if swallowed. May cause an allergic skin reaction.

Components	Species	Test Results
Copper (CAS 7440-50-8)		
Acute		
Inhalation		
LC50	Rat	> 2.77 mg/l, 4 hours
Oral		
LD50	Rat	481 mg/kg
Propylene carbonate (CAS 108-32-7)		
Acute		
Dermal		
LD50	Rabbit	> 2000 mg/kg
Inhalation		
LC50	Rat	> 5 mg/l
Oral		
LD50	Rat	> 5000 mg/kg

Skin corrosion/irritation	Exposure to contents of an open or damaged battery: Causes severe skin burns.
Serious eye damage/eye irritation	Exposure to contents of an open or damaged battery: Causes serious eye damage.

Respiratory or skin sensitization

Respiratory sensitization	No data available.
Skin sensitization	Exposure to contents of an open or damaged battery: May cause an allergic skin reaction.
Germ cell mutagenicity	No data available.
Carcinogenicity	Exposure to contents of an open or damaged battery: May cause cancer.

IARC Monographs. Overall Evaluation of Carcinogenicity

Cobalt lithium dioxide (CAS 12190-79-3)	2B Possibly carcinogenic to humans.
Nickel (CAS 7440-02-0)	1 Carcinogenic to humans.

NTP Report on Carcinogens

COBALT LITHIUM NICKEL OXIDE (CAS 182442-95-1)	Known to be human carcinogen.
Nickel (CAS 7440-02-0)	Reasonably anticipated to be a human carcinogen.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

Reproductive toxicity	No data available.
Specific target organ toxicity - single exposure	No data available.
Specific target organ toxicity - repeated exposure	No data available.
Aspiration hazard	No data available.

Chronic effects	Exposure to contents of an open or damaged battery: Prolonged inhalation may be harmful. Prolonged exposure may cause chronic effects.
Further information	Exposure to hazardous ingredients is not anticipated under normal conditions of use.

12. Ecological information

Ecotoxicity Based on available data, the classification criteria are not met for hazardous to the aquatic environment. However, in case of accidental release of large amounts a hazardous effect cannotbe excluded.

Components		Species	Test Results
Nickel (CAS 7440-02-0)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia magna)	1 mg/l, 48 hours
			1 mg/l, 48 Hours
	LC50	Calanoid copepod (Pseudodiaptomus coronatus)	6.17 - 12.4 mg/l, 72 hours

Persistence and degradability	No data is available on the degradability of this product.
Bioaccumulative potential	No data available.
Mobility in soil	No data available.
Other adverse effects	None known.

13. Disposal considerations

Disposal instructions	Recycle the batteries, as the primary disposal method. Collect and reclaim or dispose in sealed containers at licensed waste disposal site.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Dispose of in accordance with local regulations. This product and its container must be disposed of in a safe manner.
Contaminated packaging	If contaminated by a leaking or damaged battery, empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

UN 3480, Lithium-ion batteries, 9

UN 3481, Lithium-ion batteries contained in equipment, 9

UN 3481, Lithium-ion batteries packed with equipment, 9

The Watt-hour rating for all Motorola Solutions, Inc. lithium-ion products is ≤ 20 Watt-hours for cells and ≤ 100 Watt hours for batteries.

When packaged and shipped by Motorola Solutions, Inc., these batteries are tested, packaged, marked, and labeled in accordance with all applicable requirements for transport by mode of shipment (air, sea or ground), as follows:

1) International Air Transport Association (IATA), International Civil Aviation Organization (ICAO) Technical Instructions Dangerous Goods Regulations:

a) PI 965 Section IB (UN 3480, Lithium-ion batteries), offered for transport at a state of charge (SOC) not exceeding 30% of their rated design capacity.

b) PI 966 Section II (UN 3481, Lithium-ion batteries packed with equipment), cells and/or batteries with a watt-hour rating in excess of 2.7Wh are offered for transport at a state of charge (SoC) not exceeding 30% of their rated design capacity, and

c) PI 967 Section II (UN 3481, Lithium-ion batteries contained in equipment);

2) International Maritime Dangerous Goods (IMDG) Code Special Provision 188;

3) U.S. Department of Transportation (DOT) 49 CFR 173.185(c);

4) Canadian Transport of Dangerous Goods Regulations (TDGR) Special Provision 34;

5) Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) Special Provision 188;

6) UN Model Regulations Special Provisions 188;

All Motorola Solutions Li-ion batteries are tested in accordance with the UN Manual of Tests and Criteria, Part III, Subsection 38.3 Revision 3, Amendment 1 or any subsequent revision and amendment.

15. Regulatory information

US federal regulations

This product contains a "Hazardous Chemical" with potential for exposure as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

All components are listed on or exempt from the U.S. EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

COBALT LITHIUM NICKEL OXIDE (CAS 182442-95-1)	0.1 % One-Time Export Notification only.
Lithium manganese oxide (CAS 12057-17-9)	1.0 % One-Time Export Notification only.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Cobalt lithium dioxide (CAS 12190-79-3)	LISTED
Copper (CAS 7440-50-8)	LISTED
Lithium manganese oxide (CAS 12057-17-9)	LISTED
Nickel (CAS 7440-02-0)	LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Immediate Hazard - No
Delayed Hazard - No
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical No

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Aluminum	7429-90-5	8.64
Lithium manganese oxide	12057-17-9	8.64
Copper	7440-50-8	2.16
Nickel	7440-02-0	1.08

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Cobalt lithium dioxide (CAS 12190-79-3)
Lithium manganese oxide (CAS 12057-17-9)
Nickel (CAS 7440-02-0)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

US state regulations

US. Massachusetts RTK - Substance List

Aluminum (CAS 7429-90-5)
Copper (CAS 7440-50-8)
Graphite (CAS 7782-42-5)
Nickel (CAS 7440-02-0)

US. New Jersey Worker and Community Right-to-Know Act

Aluminum (CAS 7429-90-5)
Cobalt lithium dioxide (CAS 12190-79-3)
Copper (CAS 7440-50-8)
Graphite (CAS 7782-42-5)
Lithium manganese oxide (CAS 12057-17-9)
Nickel (CAS 7440-02-0)

US. Pennsylvania Worker and Community Right-to-Know Law

Aluminum (CAS 7429-90-5)
Cobalt lithium dioxide (CAS 12190-79-3)
COBALT LITHIUM NICKEL OXIDE (CAS 182442-95-1)
Copper (CAS 7440-50-8)
Graphite (CAS 7782-42-5)
Lithium manganese oxide (CAS 12057-17-9)
Nickel (CAS 7440-02-0)

US. Rhode Island RTK

Aluminum (CAS 7429-90-5)
Cobalt lithium dioxide (CAS 12190-79-3)
Copper (CAS 7440-50-8)
Lithium manganese oxide (CAS 12057-17-9)
Nickel (CAS 7440-02-0)

US. California Proposition 65

WARNING: This product contains a chemical known to the State of California to cause cancer.

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

COBALT LITHIUM NICKEL OXIDE (CAS 182442-95-1)
Nickel (CAS 7440-02-0)

International Inventories

Country(s) or region	Inventory name	On inventory (Yes/No)*
Australia	Australian Inventory of Chemical Substances (AICS)	No
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	No

Country(s) or region	Inventory name	On inventory (Yes/No)*
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	No
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No
Malaysia	Department of Occupational Safety and Health (DOSH)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date 27-Jan-2026

Revision date 9-Feb-2026

Version # 02

Disclaimer Motorola Solutions, Inc. cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.