



# Safety Data Sheet

## Lithium Ion Batteries

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### 1. Identification

**Important note:** As a solid, manufactured article, exposure to hazardous materials is not expected with normal use. This battery is an “article” pursuant to 29 CFR 1910.1200 and, as such, is not subject to the OSHA Hazard Communication Standard and no MSDS is required. Although not legally required, this Safety Data Sheet contains valuable safety information for lithium ion batteries and is provided as a service to our customers.

Product name:

Lithium ion cells and batteries (various types including cylindrical or prismatic lithium ion cells, lithium ion polymer cells, and batteries made from these cell types)

Manufacturer:

Viavi Solutions  
6001 America Center Drive, 6<sup>th</sup> Floor  
San Jose, CA 95002  
USA

Phone:

(408) 546-5000

Emergency contact (Chemtrec):

1-800-424-9300: US and Canada / 1-703-527-3887: International

### 2. Hazard(s) identification

There are no hazards when measures for proper handling and storage are followed.

In case of damage to a battery cell, there is danger of release of hazardous substances including a highly flammable gas mixture and dangerous levels of heat.

In case of fire, there is danger of release of hazardous combustion byproducts (smoke).

Lithium ion batteries are not considered hazardous by the OSHA Hazard Communications Standard 29 CFR 1910.1200.

### 3. Composition

These materials are fully contained within the battery cells, and do not present a hazard unless the battery has been damaged.

Anode	Lithium Cobalt Oxide (LiCoO <sub>2</sub> )
Electrolyte	Lithium Hexafluorophosphate (LiPF <sub>6</sub> ) dissolved in a mixture of ethylene carbonate (C <sub>3</sub> H <sub>4</sub> O <sub>3</sub> ) and diethyl carbonate (C <sub>5</sub> H <sub>10</sub> O <sub>3</sub> )

Other materials, such as the battery housing and the electrical insulation, are not hazardous under normal conditions but may emit hazardous chemicals such as carbon dioxide, carbon monoxide and formaldehyde in a fire.

#### 4. First aid measures

Under normal conditions these batteries are not hazardous, but under unusual circumstances they can become hazardous. The battery can produce hazardous chemicals if the internal cells rupture or vent, and burning the battery will produce hazardous levels of heat and dangerous combustion byproducts (smoke).

After inhalation	Ensure plenty of fresh air. Consult a physician.
After contact with skin	Wash off immediately with soap and plenty of water. Consult a physician if irritation continues.
After contact with eyes	Rinse eyes immediately with plenty of water, including under the eyelids, for at least 15 minutes. Seek immediate medical treatment from an eye specialist.
After ingestion	Drink plenty of water. Call a physician immediately.

#### 5. Fire fighting measures

Remove the batteries from the fire fighting area if you can do this without risk.

For a small fire use dry chemical, CO<sub>2</sub>, water spray, or regular foam.

For a large fire use water spray, fog, or regular foam.

Fire fighting personnel should use a self-contained breathing apparatus.

Detailed information on fighting a lithium ion battery fire can be found in Guide 147 (Lithium Ion Batteries) of the US DOT Emergency Response Guide.

#### 6. Accidental release measures

Under normal conditions this section does not apply.

If the cells rupture or are damaged they can vent hazardous substances. In that case:

- Use personal protective clothing.
- Avoid contact with eyes, skin and clothing.
- Avoid breathing fumes.
- Do not discharge hazardous substances into drains, surface water, or ground water.
- Take up mechanically and send for disposal.

#### 7. Handling and storage

Do not crush, puncture, or otherwise damage the battery. Do not incinerate. Do not short circuit. Do not expose the battery to extreme temperatures.

Store in a dry place, at temperatures between -40C (-40F) and 60C (140F). Exposure to extreme high temperatures can cause the cells within the battery to vent (releasing chemicals that might become hazardous).

## **8. Exposure controls and personal protection**

This section does not apply. Exposure controls and personal protection are not needed under normal day-to-day conditions.

## **9. Physical and chemical properties**

Lithium ion batteries can produce hazardous temperatures when damaged. This can start a fire, or it can contribute to the intensity of a fire. This can ignite other nearby batteries. Once ignited, the cells burn with an intense and very hot flame.

Excessive internal pressure (such as from a fire or other high temperature) will cause the cells to vent, discharging the highly inflammable electrolyte. This can easily cause a fire to flare, and it might cause an explosion.

When burning, lithium batteries will generate dangerous gasses including carbon monoxide, carbon dioxide, formaldehyde, and small amounts of hydrogen fluoride (HF).

The electrolyte may form a small amount of hydrofluoric acid on contact with water.

## **10. Stability and reactivity**

Lithium ion batteries are chemically stable.

Keep away from open flame, hot surfaces, and sources of ignition. Do not puncture, crush or incinerate cells.

If cells are punctured, crushed or incinerated, hazardous decomposition byproducts include carbon monoxide, carbon dioxide, formaldehyde, and small amounts of hydrogen fluoride (HF).

## **11. Toxicological information**

Lithium batteries are harmful when swallowed. Seek immediate medical attention if swallowed.

Under normal conditions no toxic substances are exposed.

Keep away from open flame, hot surfaces, and sources of ignition. Do not puncture, crush or incinerate cells.

Under normal conditions there are no toxicological effects.

## **12. Ecological information**

Ecological damage has not occurred and is not expected to occur under normal conditions.

Keep away from open flame, hot surfaces, and sources of ignition. Do not puncture, crush or incinerate cells.

Do not flush into surface water or sanitary sewer system.

### 13. Disposal considerations



Lithium ion batteries are not classified as hazardous waste, but they should be recycled. They contain materials that can be recovered and reused.

Dispose of properly. If further information is needed, consult Viavi Solutions.

### 14. Transport information

For transportation purposes, lithium ion batteries are considered dangerous goods. They must comply with regulations defined by ICAO, IMDG, US DOT, and IATA DGR (59<sup>th</sup> Edition, 2018).

These batteries have been tested for safety in transportation, as defined in the UN Manual of Tests and Criteria, Revision 4 or later, Section 38.3.

These batteries have a capacity no greater than 100 Watt hours, so they may be shipped under IATA DGR (59<sup>th</sup> Edition, 2018) Packing Instruction 965, either Section IB or Section II. When shipped with or contained in equipment they may be shipped under Section II of either PI 966 or PI 967 (see table below). The IATA DGR (59<sup>th</sup> Edition, 2018) also defines other requirements, such as the nature of the packaging materials, the per-package limit, the required labeling and external marking, and the training requirements for personnel who ship packages containing lithium ion batteries. Please consult the IATA DGR (59<sup>th</sup> Edition, 2018) and your freight carrier before shipping a package containing lithium ion batteries (or products containing them).

Reference information:

UN shipping name	UN ID	Packing Instruction	Hazard class	ERG code
Lithium ion batteries	UN 3480	965	9	9F
Lithium ion batteries packed with equipment	UN 3481	966	9	9F
Lithium ion batteries contained in equipment	UN 3481	967	9	9F

### 15. Regulatory information

All lithium ion batteries sold by Viavi Solutions have been tested and found to comply with the requirements of the UN Manual of Tests and Criteria, Revision 4 or later, Section 38.3.

Batteries may also have other certifications, such as UL 2054 or EN 62133 (for CE mark). Consult the markings on the battery for additional certifications.

### 16. Other information

Much of the information contained in this SDS (Safety Data Sheet) is taken from the MSDSs provided by the lithium ion cell manufacturers, and from the US DOT Emergency Response Guide. Viavi Solutions is not responsible for the accuracy of this information.