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# cNODE Micro



## Battery safety data sheet

KONGSBERG

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### SECTION 1: Identification

The specification describes the technical parameters for the battery.

cNODE Micro contains a custom made 14.5 Ah Li-Ion battery.

- **Product name:** cNODE Micro battery
- **Part number:** 426688
- **Manufacturer:** Kongsberg Maritime AS
- **Address:** Strandpromenaden 50, 3190 Horten, Norway
- **Telephone:** +47 33 03 24 07 (24 h)
- **Email address:** [km.support.hpr@kongsberg.com](mailto:km.support.hpr@kongsberg.com)
- **Website :** <https://www.kongsberg.com/maritime>

#### Note

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*The battery is a solid and sealed unit. The battery cannot be opened to reveal the individual cells.*

*For additional information about the cells inside the sealed battery pack, see the safety data sheet provided by the cell manufacturer. <https://lithiumwerks.com/>*

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### SECTION 2: Hazards identification

The battery is not labelled with a hazmat label. It is not classified as dangerous or hazardous when undamaged and used as intended, and as such it is exempted from GHS (Globally Harmonized System of Classification and Labelling of Chemicals) classification and labelling.

Do not open, disassemble, crush or burn the battery. The battery contains dangerous ingredients. Exposure to the ingredients contained within the battery cells could be harmful. The battery cells include a barrier, preventing exposure to the user and environment. The battery cells are not classified as hazardous according to Regulation (EC) No. 1272/2008.

The chemicals in the battery cells are contained in a sealed enclosure. Risk of exposure occurs only if the cell is mechanically, thermally or electrically abused to the point of compromising the enclosure. If this occurs, exposure to the electrolyte solution contained within can occur by inhalation, ingestion, eye contact and skin contact. The electrolyte solution can be corrosive and may cause irritation and burns.

#### Other hazards

- **Overcharge:** If the cells that form the battery block are overcharged, the results may be a thermal runaway.

- **External fire:** Internal pressure and thermal runaway may be the consequences if the cells inside the battery are exposed to temperatures above 85 °C.
- **Internal short circuit:** Internal short circuit in a cell. Destruction of the separator can cause a short circuit between the anode and cathode. Thermal runaway and fire is possible.
- **Water ingress:** Internal pressure, thermal runaway and chemical reactions may be the consequence.

The transponder is fitted with a pressure relief valve at the bottom of the unit. The relief valve prevents overpressure. Noxious gases and ingredients will then leak out of the transponder until the chemical reactions have stopped. Products generated by the chemical reactions during an emergency may however clog this pressure release valve.

### **SECTION 3: Composition**

The battery is solid with a hard surface.

The lithium metal cells have the following chemical formula:

Li-Ion (LiFePO<sub>4</sub>)

- **Negative electrode:** Lithium
- **Positive electrode:** Carbon
- **Nominal capacity:** 14.52 Wh
- **Lithium weight:** 1.33 g

*Note*

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*For additional information about the cells inside the sealed battery pack, see the safety data sheet provided by the cell manufacturer.*

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- **Manufacturer:** Lithium Werks
- **Cell type:** APR18650
- **Manufacturer's website:** <https://lithiumwerks.com>

### **SECTION 4: First aid measures**

The battery will release toxic fumes if burned or exposed to fire.

If subjected to gas from a burning battery, remove the source of contamination or move yourself and any victims to fresh air. Seek medical advice.

- **Inhalation:** The chemicals are lung irritant. Avoid inhaling any vented gases. Remove the victim and yourself from exposure. Rest and keep warm. If breathing is difficult, seek emergency medical attention.
- **Skin contact:** The chemicals are skin irritant. Rinse immediately with a lot of water and soap for at least 15 minutes. Wipe immediately away excess material with waterless hand cleaner. Remove contaminated clothing and wash it thoroughly before reuse.

- **Eye contact:** The chemicals are eye irritant. Flush immediately with a lot of clear tepid water for at least 15 minutes.
- **Ingestion:** Exposure to the chemicals may cause tissue damage to throat and gastro/respiratory tract if swallowed. If ingested, rinse mouth and surrounding area with tepid water. Dilute by drinking plenty of water. Seek medical advice.

## **SECTION 5: Firefighting measures**

The transponder is designed to withstand damage to the internal battery pack. Non-flammable material is used. In case of fire, move the battery away from the fire area if you can do it without compromising your own safety. Extreme mechanical abuse to the battery may result in a ruptured seal and exposure.

The individual cells in the battery pack contain a flammable liquid electrolyte that may vent, ignite and produce sparks when subjected to high temperatures ( $> 150\text{ }^{\circ}\text{C}/302\text{ }^{\circ}\text{F}$ ), when damaged or abused. A burning battery can ignite other batteries in close proximity.

Suitable extinguishing media are dry chemical, CO<sub>2</sub>, water spray or regular foam. Cool down the battery/transponder with copious amounts of cold water.

The interaction with water or water vapour and exposed lithium hexafluorophosphate (Li PF<sub>6</sub>) may result in the generation of hydrogen and hydrogen fluoride (HF) gas. Contact with battery electrolyte may be irritating to skin, eyes and mucous membranes. Fire will produce irritating, corrosive and/or toxic gases. Fumes may cause dizziness or suffocation. Don a self-contained breathing apparatus (SCBA).

### *Note*

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*In case of an external fire, always remove transceiver units and lithium batteries.*

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## **SECTION 6: Accidental release measures**

During normal operation, accidental release measures are not applicable. Extreme mechanical abuse to the battery may result in a ruptured seal and exposure.

As an immediate precautionary measure, isolate the spill or leak area at least 25 metres (75 feet) in all directions. Keep unauthorized personnel away. Stay upwind, and keep out of low areas. Ventilate closed areas before entering. Wear adequate personal protective equipment.

Prevent material from contaminating soil and from entering sewers or waterways. Stop the leak if safe to do so. Contain the spilled liquid with dry sand or earth. Clean up the spills immediately.

Absorb spilled material with an inert absorbent (dry sand or earth). Scoop contaminated absorbent into an acceptable waste container. Collect all contaminated absorbent and dispose of it according to relevant regulations. Scrub the area with detergent and water; collect all contaminated water for proper disposal.

## **SECTION 7: Handling and storage**

Do not open, disassemble, crush or burn the battery.

- 1 Do not expose the battery to water, sea water or other high-conductivity liquids.

- 2 Avoid mechanical or electrical abuse.
- 3 Do not expose the battery to temperatures outside the range of -30 °C to +70 °C.
- 4 Store in a dry location.

To minimize any adverse affects on the battery performance it is recommended that it is kept at room temperature (25 °C ± 5 °C). A storage temperature outside the recommended temperature range may foreshorten the service life.

To avoid complete discharge of the battery during long term storage, the battery should be fully charged and recharged every 6 months. A completely discharged battery will not charge, as all lithium ion batteries.

## **SECTION 8: Exposure control and personal protection**

Airborne exposures to hazardous substances are not expected when the battery is undamaged and used as intended. Personal protective equipment (PPE) is not required when the battery is undamaged and used as intended. Don personal protective equipment if the battery is damaged and you are at risk for exposure to the chemicals inside.

In the event of fire or physical damage to the battery, follow the mandatory rules for personal protection.

- **Fire or explosion:** Don a self-contained breathing apparatus (SCBA).
- **Exposure to noxious gas:** Chemical-resistant gloves and safety glasses.

## **SECTION 9: Physical and chemical properties**

The battery is solid with a hard surface. There is no risk for exposure to the chemicals inside an undamaged battery during normal operation and transportation.

The battery is a solid and sealed unit. The battery cannot be opened to reveal the individual cells.

For additional information about the cells inside the sealed battery pack, see the safety data sheet provided by the cell manufacturer.

### **Cell manufacturer**

- **Manufacturer:** Lithium Werks
- **Manufacturer's website:** <https://lithiumwerks.com/>

## **SECTION 10: Stability and reactivity**

The battery is stable. No specific handling requirements apply.

Avoid exposing the battery to fire or temperatures above 80 °C. Do not disassemble, crush, short or install the battery with incorrect polarity. Avoid mechanical or electrical abuse. Do not immerse in seawater or other high conductivity liquids.

The battery will release toxic fumes if burned or exposed to fire. Breaching of the individual cell enclosure may lead to generation of hazardous fumes which again may include extremely hazardous hydrofluoric acid (HF).

## SECTION 11: Toxicological information

Acute oral, dermal and inhalation toxicity data are not available for this battery.

Risk of irritation occurs only if the battery is abused to the point of breaking the container and opening it to reveal the individual cells. If this occurs, irritation to the skin, eyes and respiratory tract may occur.

## SECTION 12: Ecological information

Provided that the battery pack is disposed of according to local regulations and/or law, it will not have any environmental impact.

## SECTION 13: Disposal considerations

Adhere to applicable laws, regulations and guidelines when disposing of the batteries.

A lithium thionyl chloride battery does not contain any heavy metals, and is therefore not regarded as special waste (it contains only biodegradable parts).

A used lithium battery can contain a significant amount of residual energy. It is the danger of explosion that presents a problem when disposing of a battery. Used batteries must therefore be handled with the same care as new ones.

Note

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*For safe disposal, contact the nearest local company that has been approved to collect and dispose of lithium batteries.*

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## SECTION 14: Transport information

Transportation of the cNODE Micro must take place with adherence to applicable laws, regulations and guidelines; including those who address the transportation of dangerous goods in all modes of transport. When battery and transponder are shipped separately, the battery “must be shipped at a state of charge (SoC) not exceeding 30% of their rated capacity” in order to be in compliance with IATA regulations.

The battery is certified according to UN 38.3.

- **Shipment of transponder**

Each cNODE Micro transponder is transported as a closed and sealed unit, and must not be opened by unauthorized personnel.

The cNODE Micro transponder must be shipped in accordance with the prevailing national regulations; **UN 3481 PI 967 Section II**, *Miscellaneous (Lithium Ion batteries included in equipment)*.

- **Shipment of separate battery**

If the battery is shipped separately, the prevailing national regulations that apply are: **UN 3480 PI 965 Section IB**, *Miscellaneous (Lithium Ion battery)*.

For all shipments – cNODE Micro and separate batteries –, use lithium battery handling label as specified in the additional requirement of Section II of packing instructions 965, 966 and 967.

Transport identification codes:

- **Aircraft:** IATA DGR
- **Sea transport:** IMDG
- **Railway:** RID
- **Road transport:** ADR

*Note*

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*Damaged transponders that are returned to the manufacturer for repair must be transported without batteries. Damaged or spent batteries that have been recalled by the manufacturer for safety reasons must not be transported by air.*

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## **SECTION 15: Regulatory information**

Not applicable.

## **SECTION 16: Other information**

The battery manufacturers' safety data sheets are available on their websites.

- Lithium Werks: <https://lithiumwerks.com>