

1081355-03 STEP-BAT/LI-ION/18.5DC/46WH

This product is a manufactured article according to Regulation (EC) No. 1907/2006. The following document is voluntary product information in accordance with Article 33, based on the format of the safety data sheet.

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Safety data sheet

1 Identification of the product and the company

Product details

Trade name: Phoenix Contact 1081355-03 STEP-BAT/LI-ION/18.5DC/46WH
Electrochemical system: Lithium-ion
Anode (negative): Carbon (proprietary)
Cathode (positive): Metal oxide (protected)

This safety data sheet applies to the battery cells used in the following products. The energy values listed are for reference only; they do not constitute a contractual assurance of product characteristics and may differ from the values specified in specifications, data sheets, or other documents, or from the values indicated on the products.

Description / Nominal energy

STEP-BAT 5s1p 46Wh

Manufacturer information:

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hours)

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Legal notice (USA)

Safety data sheets are a sub-requirement of the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, 29 CFR Subpart 1910.1200. This Hazard Communication Standard does not apply to various subcategories, including anything defined by OSHA as an "article." According to OSHA, "article" means a manufactured item that:

- (i) is shaped in a certain design or structure during manufacture,
- (ii) whose end-use function(s) depend wholly or partly on its shape or design during end use, and
- (iii) under normal conditions of use, does not release more than very small amounts, such as minute amounts or traces, of a hazardous chemical (as defined in paragraph (d) of this section) and does not present a physical hazard or health risk to employees.

Since all our batteries are defined as "articles," they are excluded from the requirements of the Hazard Communication Standard.

Legal notice (EU)

These batteries are articles within the meaning of Regulation (EC) No. 1907/2006 (REACH) and are not "substances" or "mixtures." Under normal or reasonably foreseeable conditions of use, no intentional release of substances is anticipated.

Therefore, there is no obligation to prepare a safety data sheet in accordance with Article 31 of the REACH Regulation.

This document is provided voluntarily. The structure used is based on Annex II of Regulation (EC) No. 1907/2006, as amended by Regulation (EU) 2020/878, to ensure uniform and comprehensible provision of information.

General note

This information is intended as a service to our customers. The information is based on our current knowledge and experience. It does not constitute a contractual guarantee of product properties.

2 Hazard labeling

The battery is hermetically sealed. Therefore, the contents do not pose a hazard unless the battery is damaged or disassembled. If the contents are released due to improper handling, a self-igniting gas mixture may be released under certain circumstances (measures according to sections 4 to 6). Caution! Incorrect handling of batteries may result in a fire or explosion hazard. Batteries must not be heated above 100 °C or incinerated. The battery contents must not come into contact with water. If the negative electrode comes into contact with water or moisture, hydrogen gas is formed, which can ignite spontaneously.

3 Composition/information on ingredients

The 1081355 STEP-BAT/LI-ION battery is a 5s1p connected battery pack with Samsung SDI INR18650-25R cells. Energy 46Wh, nominal voltage 18.5V, the housing is made of Makrolon 9415, dimensions 88x45x61mm, weight 291g

Hazardous components

The battery cells used in the PHOENIX STEP-BAT Li-Ion Battery are composed as follows.

Substance name	CAS-No.	Weight % (per cell)
Cobalt oxide	1307-96-6	< 30 %
Manganese dioxide	1313-13-9	< 30 %
Nickel oxide	1313-99-1	< 30 %
Carbon	7440-44-0	< 30 %
Electrolyte (*)		< 20 %
Polyvinylidene fluoride (PVdF)	24937-79-9	< 10 %
Aluminium foil	7429-90-5	2 - 10 %
Copper foil	7440-50-8	2 - 10 %
Aluminium and inert materials		5 - 10 %

The full text of the hazard statements can be found in Section 16.

(*) Main components: Lithium hexafluorophosphate, organic carbonates.

Due to the cell structure, the hazardous components are not accessible when used properly.

During charging, a lithium-carbon intercalation phase forms which is highly flammable and corrosive but is not released under normal conditions of use.

4 Description of first aid measures

The hazardous components of this cell or battery are contained in a sealed unit. The following measures are only applicable if exposure to components has occurred, if a cell or battery leaks, is exposed to high temperatures, or is mechanically, electrically, or physically abused or damaged. The hazardous ingredients are corrosive alkaline electrolytes contained in cells with lithium metal oxide cathodes, graphite and carbon anodes, and polyvinylidene fluoride binders.

Ingestion: Rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Transport the accident victim quickly to an emergency facility.

Eye contact: In case of eye contact with the contents of an opened cell, immediately rinse the contaminated eye or eyes with water. Transport the victim to an emergency facility quickly.

Skin contact: Rinse immediately with water. If irritation or pain persists, consult a doctor.

Inhalation: Move the patient to fresh air and consult a doctor.

Protection for first responders

Aids: Do not enter areas contaminated with corrosive vapors without respiratory protection or self-contained breathing apparatus. Wear appropriate personal protective equipment as specified in Section 8.

First aid facilities: Eye wash bottle, eye shower, safety showers, or at least a source of running water are required in the area where the product is used.

Most important symptoms and effects, acute and delayed:

Acute: The contents of the battery are classified as corrosive. Ingestion of the electrolyte may cause severe irritation of the gastrointestinal tract with nausea, vomiting, and possibly burns. Inhalation of vapors may cause severe irritation of the mouth and upper respiratory tract, with a burning sensation, pain, burns, and inflammation in the nose and throat, coughing or difficulty breathing

may also occur. Eye contact may cause severe eye irritation or, in the worst case, irreversible damage and possible eye burns. Skin

contact may cause irritation and possible skin burns.

Chronic: Skin contact may aggravate existing skin conditions, such as dermatitis. Chronic inhalation may cause the same symptoms as listed above for acute inhalation.

Indications for immediate medical attention and special treatment required:

Advice to doctor: Symptomatic treatment if the person comes into contact with the corrosive liquid electrolyte from a damaged battery.

5 Firefighting measures

Suitable extinguishing media: Metal fire extinguishing powder, rock salt, or dry sand. If only water is available, it can be used in large quantities.

Extinguishing media with limited suitability: Carbon dioxide (CO₂) is not suitable. Water in small quantities may have adverse effects.

Special protective equipment for firefighting: Firefighting clothing and self-contained breathing apparatus.

Special hazard: Cuvettes may explode and release metal parts. Contact of the electrolyte with water may result in traces of hydrofluoric acid. Avoid contact and ensure good ventilation. Contact of the charged anode material with water produces highly flammable hydrogen gas.

Caution: Do not allow used extinguishing agents to enter surface water or groundwater. If necessary, thicken water or foam with suitable solids. Dispose of properly.

6 Measures in case of accidental release

Personal precautions, protective equipment, and emergency procedures:

As an immediate precaution, cordon off the spill or leak area at least 25 meters in all directions. Keep unauthorized personnel away.

Stay upwind and avoid low-lying areas. Ventilate enclosed areas before entering.

Environmental precautions:

Absorb spilled material with non-reactive absorbent such as vermiculite, clay, or earth. Prevent penetration into the ground, sewage system, and natural waterways. In such cases, inform the local authorities.

Methods and material for containment and cleaning up:

Evacuate the spilled area immediately and remove sources of ignition. Do not touch spilled material. Cleaning personnel must be trained in the safe handling of this product. Spilled material can be absorbed with non-reactive absorbents such as vermiculite. Place

cells or batteries in individual plastic bags and then seal them tightly in suitable containers for disposal. Ensure that the spilled material is not exposed to moisture during cleaning. Immediately take sealed containers outside. Lined steel drums are suitable for

storing damaged cells or batteries until proper disposal is possible.

7 Handling and storage

A lithium-ion battery pack must be labeled with the following or equivalent warning: "CAUTION: Fire and burn hazard. Do not open, crush, heat above the maximum temperature specified by the manufacturer, or incinerate. Follow the manufacturer's instructions."

Environmental conditions:

Under normal storage conditions, the temperature should be between +10 °C and +25 °C and should not exceed +35 °C. During shortterm exposure (e.g., during transport), the temperature may range from -20 °C to +60 °C. Extreme humidity (above 95% and below 40% relative humidity) over long periods should be avoided as it is harmful to both the batteries and the packaging. Batteries should therefore not be stored near heating appliances or in direct sunlight. Large temperature fluctuations should be avoided.

Higher temperatures can reduce electrical performance. Further details can be found in the cell data sheet.

Storage category according to TRGS 510:

It is recommended to observe the "Technical Rule for Hazardous Substances TRGS 510 - Storage of Hazardous Substances in Non-Stationary Containers" and to treat lithium-ion batteries according to storage class 11 ("combustible solid substances").

Storage of large quantities:

Please observe the recommendations of the German Insurance Association (GDV) on lithium batteries: VdS 3103. When storing large quantities (storage volume used > 7 m³ and/or more than 6 pallets), the batteries must be stored in fire-resistant or separate rooms or areas (e.g., warehouses or containers for hazardous goods). Mixed storage with other products is not permitted. The storage area must be monitored by an automatic fire alarm system connected to a permanently manned location. A fire extinguishing system must contain the extinguishing agents specified in section 5.

8 Exposure controls/personal protection

Under normal conditions (during loading and unloading), no release of ingredients occurs.

9 Physical and chemical properties

Not applicable when closed.

10 Stability and reactivity

Stability:

Stable

Conditions to avoid:

Keep away from open flames, hot surfaces, and ignition sources. Do not pierce, crush, or burn.

Materials to avoid:

No materials to be mentioned in particular.

Hazardous decomposition products:

In the event of open cells, there is a possibility of release of hydrofluoric acid and carbon monoxide.

Possibility of hazardous reactions:

There is a risk of bursting when heated above 100 °C.

Additional information:

No decomposition if stored and used according to regulations.

11 Toxicological information

Under normal conditions (during charging and discharging), no substances are released. In the event of accidental release, see information in sections 2 to 4 and 6.

12 Ecological information

PHOENIX STEP-BAT Li-Ion batteries do not contain heavy metals as defined by European REGULATION (EU) 2023/1542; they meet the requirements of this directive regarding chemical composition. Mercury has not been "intentionally introduced (as opposed to mercury that may be incidentally present in other materials)" as defined by the U.S. "Mercury-Containing and Rechargeable Battery Management Act" (May 13, 1996). The regulation on the limitation of mercury content in batteries, which was issued on December 31, 1997, by the Chinese authorities, including the State Administration of Light Industry and the State Environmental Protection Administration (State Administration of Light Industry and State Environmental Protection Administration) defines "low mercury" as "mercury content in the battery of less than 0.025%" and "mercury-free" as "mercury content in the battery of less than 0.0001%". PHOENIX STEP-BAT Li-ion batteries belong to the category of mercury-free batteries (mercury content below 0.0001%).

13 Disposal instructions

To prevent short circuits and overheating, used PHOENIX STEP-BAT Li-ion batteries should never be stored or transported in bulk.

Suitable measures against short circuits are:

- Storing the batteries in their original packaging
- Covering the terminals
- Embedding them in dry sand

European Union

In the European Union, the manufacture, marketing, use, and disposal of batteries and accumulators are regulated by REGULATION

(EU) 2023/1542 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of July 12, 2023, on batteries and waste batteries. Customers can obtain detailed information on proper return and disposal in the individual member states from the responsible national

authorities or via the relevant take-back systems.

Importers and users outside the European Union are obliged to comply with the applicable national laws and regulations.

14 Information on transport

PHOENIX STEP-BAT Li-Ion batteries are classified as UN 3480 lithium-ion batteries and are tested in accordance with subsection 38.3

of the UN Manual of Tests and Criteria. The test results and other information relevant to transport are listed in special Supplier's Test

Summaries.

When transporting large quantities of batteries by ship, truck, or rail, they must not be stored in places with high temperatures and must not be exposed to condensation. During transport, ensure that the packaging is not damaged, as damage to the packaging can

cause fire. If the packaging is damaged, special procedures must be followed, including inspection and, if necessary, repackaging, and handle with care.

15 Information on legal regulations

Consideration of labeling

European Union:

According to REGULATION (EU) 2023/1542 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of July 12, 2023 on batteries and

waste batteries, batteries must be marked with the symbol of a crossed-out wheellie bin. Where applicable, additional information on

harmful substances contained in the batteries and other mandatory information must also be provided.

According to Regulation (EU) 2023/1542, secondary batteries and accumulators must be marked with a capacity label.

An EU conformity assessment must be carried out and the CE marking must be affixed.

In accordance with the applicable dangerous goods regulations (see section 14), accumulators must also be marked with the watthour rating (Wh).

Water hazard class:

The provisions of the Water Resources Act (WHG) do not apply, as the battery is a product and not a substance and therefore does not

pose a risk of water pollution. This does not apply if batteries are damaged, leaking, or improperly dismantled.

16 Further information

The following R phrases correspond to the hazard labels mentioned in sections 2 and 3.

R10 – Flammable.
 R20/22 – Harmful by inhalation and if swallowed.
 R22 – Harmful if swallowed.
 R34 – Causes burns.
 R40 – Suspected of causing cancer.
 R43 – May cause sensitization by skin contact.
 R48/23 – Toxic: danger of serious damage to health by prolonged exposure through inhalation.
 R49 – May cause cancer by inhalation.
 R50 – Very toxic to aquatic organisms.
 R53 – May cause long-term adverse effects in the aquatic environment.

Regulations valid at the time of creation:

Area	Currently valid regulations
UN-testing regulations	UN Manual of Tests and Criteria, Rev.8 (2023) + Amendment 1 (2025)
Air transport (IATA)	IATA DGR 2026 - 67th edition
Road transport (ADR)	ADR 2025
Sea transport (IMDG)	IMDG-Code 2024 - Amendment 42-24
Rail transport (RID)	RID 2025
EU Battery Regulation	EU Battery Regulation (EU) 2023/1542
RoHS	RoHS compliant according to separate declaration
REACH	REACH compliant according to separate declaration