Safety Data Sheet in Accordance with Regulation (EC) No. 1907/2006, Annex II

FE Battery Housing

SDS-0851-0002_EN_BatteryPack_FE_AT0420-F_DE

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1 Identification of the Substance/Mixture and the Company

Product Details

Trade name:	Conductix-Wampfler FE Energy Storage Housing
Recommended use:	Power supply for RTG's (Rubber tired gantry cranes)
Electrochemical system:	Lithium-ion
Anode (negative):	Carbon (proprietary)
Cathode (positive):	Metal oxide (proprietary)

This SDS (Safety Data Sheet) applies to the following products.

The energy values listed are only intended as a guide; they do not represent a contractual assurance of product properties and may deviate from the values stated in specifications, data sheets or other documents or on the products.

Name: Battery Housing for FE RTG Use.

Energy: 44 / 52 / 59 / 67 / 74 / 81 / 89 kWh

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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 sub-categories, including anything defined as "Article" by OSHA. According to OSHA, "Article" means a manufactured item that is not a liquid or a particle:

- **(I)** which is formed to a specific shape or design during manufacture;
- **(II)** which has end use function(s) dependent in whole or in part upon its shape or design during end use; and
- **(III)** which under normal conditions of use, releases no more than very small amounts, e.g., tiny or trace amounts of a hazardous chemical (as defined in Paragraph (d) of this section), and does not present a physical or health hazard to employees.

Because all of our batteries are defined as "Articles", they are exempt from the requirements of the Hazard Communication Standard.

Legal Notice (EU)
These batteries are not "substances" or "mixtures" within the meaning of Regulation (EC) No. 1907/2006 EC. Rather, they are to be regarded as "Articles", the handling of which is not intended to release any substances. Therefore, there is no obligation to submit a Safety Data Sheet according to Regulation (EC) 1907/2006, Article 31.

General Comment
This information is a service to our customers. The present data is based on our current level of knowledge and experience. These are not contractual assurances of product properties.

2 Potential Hazards

Battery modules:

The battery is hermetically sealed. Thus, the ingredients have no potential hazard unless the battery is damaged or disassembled.
If the ingredients are released in the event of incorrect handling, a self-igniting gas mixture may arise under certain circumstances (measures according to Sections 4 to 6).
Caution! Incorrect handling of batteries can result in burns or bursting. Batteries must not be heated to over 100° C or burned. The contents of the battery must not come into contact with water. If the negative electrode comes into contact with water or moisture penetrates, hydrogen gas is formed, which can spontaneously ignite.

Composition/Information on Ingredients

Chemical characterization:

Battery modules:

Content	CAS No.	Material
2 % to 10 %	7429-90-5	Aluminum foil
7% to 50%	182442-95-1	Cobalt lithium manganese nickel oxide (proprietary)
0 % to 5 %	24937-79-9	Polyvinylidene fluoride (PVDF)
10 % to 30 %	7440-44-0	7440-44-0 carbon (proprietary)
5 % to 20 %	N/A	Organic carbonate
1 % to 6 %	N/A	Lithium salt
0% to 10%	N/A	Aluminum, copper and inert polymer residues

Heavy metals such as mercury, cadmium, lead and chromium are not used in the batteries. During the charging process, a lithium-carbon intercalation phase forms, which is highly flammable and corrosive, but is not released under the circumstances of normal use.

SVHC substances according to REACH (Article 33) Content CAS No. EC No. Material

Content	CAS No.	Material
> 0.1%	1120-71-4 214-317-9	1,3-propanesultone

3 First Aid Measures

Following inhalation:	Fresh air. Seek medical attention.
Following skin contact:	Remove solid particles immediately. Rinse affected areas with plenty of water (min. 15 min). Remove contaminated cloth immediately. Seek medical attention.
Following eye(s) contact:	Carefully rinse the eye(s) with plenty of water (min. 15 minutes). Seek medical attention.
Following ingestion:	Drink plenty of water. Avoid vomiting. Seek medical attention. Do not attempt to neutralize.

4 Firefighting Measures

Suitable extinguishing media:	Use 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(CO_2) is not suitable. Small amounts of water can have harmful effects.
Special protective equipment for firefighting:	Contamination cloth including breathing apparatus.
Special hazards:	Cells can explode and release metal parts. If the electrolyte comes into contact with water, traces of hydrofluoric acid can form. In this case, avoid contact and ensure good ventilation. When the charged anode material comes into contact with water, extremely flammable hydrogen gas is produced. Caution! Do not allow extinguishing media used to penetrate surface water or ground water. If necessary, thicken water or foam with suitable solids. Dispose of properly.

5 Accidental Release Measures

Personal measures:	Wear personal protective equipment appropriate to the situation (protective gloves, face protection, respiratory protection).
Environmental protection measures:	In the event of a battery break, avoid skin contact and collect any released material in a plastic-lined container. Bind released components with powder (rock salt, sand). Dispose of in accordance with local laws and regulations. Avoid the penetration of leached substances into the ground, the sewer system or water bodies.
Treatment for cleaning:	If the battery case is disassembled, small amounts of electrolyte may leak out. Pack the battery tightly, including the ingredients, together with lime, sand or rock salt. Then clean with water.

6 Handling and Storage

Guide to the safe handling of battery modules:	- Always observe the warnings on the batteries and in the manuals of the devices. - Only use the recommended types of batteries. - Unpacked batteries should not be lying around in bulk. - When changing batteries, always replace all batteries with new ones of the same type and brand. - Do not dispose of batteries in water. - Do not dispose of batteries in fire. - Avoid deep discharges. - Do not short-circuit batteries. - Use the recommended charging time and the recommended current. - Do not open or disassemble the batteries. The instruction manual itself must contain: - Possible effects if batteries are ingested, - The instruction to consult a doctor immediately if you suspect that batteries have been ingested or are in any part of the body.
Environmental conditions:	-20° C to 20° C when stored. -20° C to 60° C during brief exposure (e.g., transport) Avoid extreme temperature variations. Do not store near heating devices. Avoid direct sunlight. The electrical output can be reduced at higher temperatures. Storing unpacked batteries can lead to short circuits and heat generation.
Storage classification according to TRGS 510:	It is recommended to observe the TRGS 510 "Technical rule for hazardous substances - Storage of hazardous substances in non-stationary containers" and to treat lithium-ion batteries in accordance with Storage Category 11 ("Flammable solids").
Storage of large quantities:	Note the recommendations of the German Insurance Association (GDV) on lithium batteries: VdS 3103. When storing larger quantities (utilized storage volume > 7m3 and/or more than 6 pallets), batteries must be stored in fire-proof or separate rooms or areas (e.g., warehouse or hazardous goods container). A mixed storage with other products is not permitted. The storage area must be monitored by an automatic fire alarm system that is connected to a permanently manned location. A fire extinguishing system must take into account the extinguishing media specified in Section 5.

7 Exposure Limits and Personal Protective Equipment

Battery modules:

Under normal conditions (loading and unloading), there is no release of ingredients.

8 Physical and Chemical Properties

Not applicable when closed.

9 Stability and Reactivity

Dangerous reactions: Risk of rupture if heated above 100° C.

10 Toxicological Information

Battery modules:

Under normal conditions (loading and unloading) there is no release of ingredients. In the event of an accidental release, see information in Sections 2 to 4 and 6.
Ingestion of a battery can be harmful. Call the local poison control center for advice and help. See Section 4.

11 Ecological Information

Battery modules:

CXW Energy Storage Modules & Housings do not contain heavy metals within the meaning of European Directive 2006/66/EC Article 21; they meet the requirements for the chemical composition of this directive.
Mercury was not "intentionally introduced (as a distinction from mercury, which may happen to be present in other materials)" within the meaning of the United States "Mercury-Containing and Rechargeable Battery Management Act" (May 13, 1996).
The regulation on limiting the mercury content of batteries announced on 12.31.1997 by the Chinese authorities, including the State Administration of Light Industry and the State Environmental Protection Administration, defines "low mercury" as "the amount of mercury in the battery of less as 0.025% by weight" and "mercury-free" as "mercury in the battery of less than 0.0001% by weight". And thus: CXW Energy Storage Modules & Housings belong to the mercury-free battery category (mercury content less than 0.0001%).

12 Disposal

To avoid short circuits and heating, used Conductix Wampfler battery housings/modules outside their housings should never be loosely stored or transported.

Suitable measures against short circuits are:

- Storage of the batteries in the original packing
- Covering the terminals
- Embedding in dry sand

European Union

In the European Union, the manufacture, handling and disposal of batteries is regulated on the basis of DIRECTIVE 2006/66/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of September 6, 2006 regarding batteries and accumulators as well as used batteries and accumulators and the repealing of Directive 91/157/EEC. Customers can find detailed information on disposal in their respective countries within the European Portable Batteries Association website (www.epbaeurope.net/legislation national.html).
Importers and users outside the EU should observe the local laws and regulations.

USA

Conductix-Wampfler energy storage modules are classified as non-hazardous waste by the federal government and can be safely disposed of in the normal municipal waste stream. However, these batteries contain recyclable materials and are accepted for recycling by Call2Recycle, Inc. For more information, please visit their website at www.call2recycle.org.

13 Transport Information

CXW Energy Storage Modules & Housings are considered UN 3536 lithium-ion batteries and are tested in accordance with 38.3 of the "UN Manual of Tests and Criteria" for compliance with the requirements of the special regulations ADR 188, IMDG 188, and the requirements of DOT/49 CFR § 173.185 and the requirements of IATA DGR Packing Instruction 965. Test results and other relevant information required for transport are provided in special "Declarations of Conformity".
When transporting large quantities by ship, truck or train, do not store the batteries in locations with high temperatures and do not expose them to condensation. Be careful not to damage the packing during transport, as damage to the packing can cause a fire. If the packing is damaged, special procedures must be followed including inspection and, if necessary, repacking and careful handling.
The code of practice for packing and shipping of secondary batteries according to IEC 62133: The packing must be suitable to avoid mechanical damage during transport, handling and stacking. The materials and the packing design must be chosen in such a way that inadvertent electrical conductivity, corrosion of the poles and the ingress of moisture are prevented.
You can find compilations of transport requirements for lithium batteries in:
https://www.lithium-batterie-service.de/en/
https://www.iata.org/whatwedo/cargo/dgr/Documents/lithium-battery-shipping-guidelines.pdf
Each module is manufactured under a quality management program in accordance with IATA DGR Section 3.9.2.6, (ADR Clause 2.2.9.1.7 e), and IMDG Code Clause 2.9.4.5.

Marking for Road Transport:

Marking for Sea Transport:

Note: In the case of combined road and sea transport, it is permissible to affix and use the marking for sea transport during road transport.

14 Regulations

Marking observance

European Union: According to the "DIRECTIVE 2006/66/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of September 6, 2006 regarding batteries and accumulators as well as used batteries and accumulators and the repealing of Directive 91/157/ EEC", the batteries must be marked with the "Crossed Out Garbage Can".
According to the dangerous goods regulations (see Section 14), battery packs must be marked with the watt-hour rating.

Water hazard class

The regulations of the German Water Resources Act (WRA) are not applicable, as the CXW energy storage devices are products and not substances, thus there is no risk of water pollution unless the batteries are damaged or disassembled.

15 Other Information

Note: Date of issue of the transport regulations: ADR 2021, RID 2021, IATA DGR 2021 (62nd Release)
IMDG Code 2021.
Last recorded change to the European Battery Directive 2006/66/EC: Directive (EU) 2018/849.
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