

Material Safety Data Sheet

1. Product & Company Identification

Product name:	Lithium Battery, non-rechargeable, 2CR5
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Size	Nominal Voltage	Capacity	Energy content
2CR5	6.0 V	1500 mAh	9.0 Wh

Manufacturer:	Conrad Electronic SE
Address:	Klaus-Conrad-Str. 1, D-92240 Hirschau
Telephone:	+49 (0) 9604 / 40 - 8988
Date of issue:	18.12.2023

2. Components of the Battery

Component	CAS#	% by weight
Manganese Dioxide	1313-13-9	30 - 40
Lithium Metal	7439-93-2	2 - 4
Electrolyte [1,2-Dimethoxyethane(EGDME)]	110-71-4	6.5 - 9.5
Electrolyte [Organic Electrolyte Mixture]	-	3.5 - 4.5
Iron	7439-89-6	32 - 38
Carbon	7440-44-0	3 - 5
Polypropylene	9003-07-0	2 - 4
Polyethylene	9002-88-4	1 - 2
Others	-	3 - 4

Aggregate Lithium Content 1.12g, 2.87%

Batteries are neither chemical substance nor mixture, but products. The chemicals are sealed in outercan to prevent from outflux in the metal steel case for durability.

No harm to health under normal usage and adequate transportation method.

This instruction states the potential danger generating from non-intended use, for the explanations of chemicals in the batteries, cautions for storage and regulations for transportation.

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3. Risk

Significant Risk

No reference

Peculiar Risk

No reference

General avoidable issues

- Chemicals in the steel can may leak without proper storage.
- Rupture or fire may happen to battery if disposed in fire or placed over 100°C.
- Heat, rupture and fire may happen to battery if short-circuit caused by stack or mixture.
- GHS classifications do not apply to the battery

4. First Aid Measures

Inhalation

Seek fresh air and immediately get medical attention after inhaling leaking component.

Skin Contact

Wash affected area with plenty of soap and water. If irritation develops, get medical attention.

Eye Contact

Flush with water for at least 15 minutes. If irritation develops, get medical attention.

Ingestion

Get medical attention immediately if ingestion.

5. Fire Extinction Measures

Fire extinguisher

Carbon dioxide; fire foam; dry sand; water spray and powder etc.

Means of extinction

Remove batteries to safe place to avoid fire spread. Use water, carbon dioxide, powder if the materials for packing is paper. Burning vapour may cause irritation to eyes, nose and throat. Hence, it is suggested put out the fire in the draught. Use mask when necessary.

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6. Measures for Leakage

If misuse the battery at application, the chemicals in steel can may vent. In such case, take measures below:

Health Cautions:

The electrolyte may not cause great damage to health as soon as inhalation or contact to skin, but it should be cleaned immediately, and fresh air would help.

Environmental Cautions:

Clean thoroughly, no significant damage to environment.

Measures/container for collection, neutralization and crimping:

Collect in an empty container and dispose according to regulations.

7. Storage

Caution:

- (1) Do not dispose batteries to fire in case of charge, short-circuit, disassembling, disformation
- (2) Do not stack or mix batteries.
- (3) Do not place batteries in meta! container, metal sheet or antistatic materials.
- (4) Batteries should be changed at the same time when used in a multiple-cell applied device.
- (5) Stored in a dry and cool place with good ventilation.
- (6) Avoid water, snow, frost or condensation of moisture when packing.
- (7) Do not place batteries near heat or hat air outlet.
- (8) Do not expose batteries to sun directly.
- (9) Avoid condensation of moisture when transferring batteries from cold to hot place.
- (10) Provide several fire extinguishers in the warehouse.

8. Exposure Control and Protective Measures

No special protection tools needed for normal usage. In case of abnormal use in devices or appliances, electrolyte may leak and certain protection tools should be used as below:

Respiratory protective equipment:

Respirators (with apparatus respiratorius)

Hand protective equipment:

Synthetic rubber gloves

Eye protective equipment:

Protective spectacles

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9. Physical/Chemical Property

States: Solid

Flash point: N/A

Form: Dihedral

Boiling point: N/A

Melting point: N/A

10. Stability and Reactivity

Stability:

It is extremely stable for normal use.

Avoid Condition:

External short-circuit, deformation by press, excessive temperature (above 100°C, which may cause heat or fire), expose to sun directly or high humidity.

Avoid Substance:

Substance that may cause short-circuit.

11. Toxicological Information

Chemicals are sealed in the steel can without danger.

The followings are toxicological information for materials of batteries for reference.

Component	Classification	Symptom
Manganese Dioxide	Acute Toxicity	Rabbit LDL0=45mg/kg Mouse LD50 (subcutaneous)=422mg/kg
	Partially Affected	Irritation to eyes, nose, throat and skin.
	Chronic Toxicity or Long-Term Toxicity	Parkinson's central nervous syndrome may caused by longterm (at least 3 months) inhalation of dirt or gas.
Lithium Metal	Acute Toxicity	No reference
	Partially Affected	Chemical burning may occur in case of contact to skin or eyes.
Electrolyte	Acute Toxicity	No reference
	Partially Affected	A little irritation to eyes.

12. Environment Effects

Residual property/Resolvability:

No reference

Soil Pollution

No reference

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13. Disposal Considerations

Dispose of in a consistent manner according to the regulations.

For safety purpose, insulation measures are needed to avoid heat or rupture caused by shortcircuit. Such as film on terminals, insulation bag or original package for packing.

14. Transportation Information

*Attention, the latest regulation shall prevail, and the specifications of transportation and its difference shall be confirmed with the carrier.

All single lithium-metal cells or battery packs are considered as Class 9 according to international standards as shown below. The transport of lithium-metal cells or battery packs should meet requirements defined in International Transport Regulations. All of our products (defined in chapter 1) and its packing forms meet the requirements of UN Manual of Test and Criteria, Part III, subsection 38.3. Besides, the following transportation requirements shall be met when delivery.

<Air Transport>

Lithium metal battery. The goods meet the requirements in General Requirements and section IB of Packaging Instruction 968. The goods are packaged according to the Packaging Instruction 968 section IB. Cargo Aircraft Only. All batteries, including single cells with aggregate lithium content less than 1 g or battery pack models with aggregate lithium content less than 2g, conform to 968 Section IB defined in Packing Instruction of IAT A-DGR. The product and its packing form meet the requirements of Section IB, though the battery itself is considered as dangerous goods, it can be transported without applying containers defined as Class II.

<Sea Transport>

Batteries, including single cells with aggregate lithium content less than 1 g or battery pack models with aggregate lithium content less than 2g, conform to special regulation 188 and transport condition defined in 1 MDG- Code. It can be transported as nondangerous goods.

UN No.	Proper Shipping Name/Description
UN 3090	Lithium Metal Batteries
UN 3091	Lithium Metal Batteries Contained in Equipment
UN 3091	Lithium Metal Batteries Packed with Equipment

Related Regulation:

Transport form	Relevant agencies/Issued documents
Air transport	ICAO/TI, IATA/DGR
Sea transport	IMO/IMDG CODE
Land transport (within Europe)	RID, ADR
US/International	US DOT/DOT 49 CFR
	UN: Recommendations on the transport of dangerous goods: Manual of Tests and Criteria:Part III, Subsection 38.3

*1 Dangerous Goods Regulations - 65th Edition Effective 1 January 2024: International Air Transport Association (IATA)/Packaging Instructions 968-970

*2 IMDG Code 41-22

*3 RID - COTIF 1999/Appendix C-RID/Article 5

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15. Regulatory information

Related environment regulations for batteries: EU countries according to the Battery Directive 2006/66/EC, and other countries like China, Korea, Brazil, North America or Canada have similar regulations.

16. Others

Reference

- (1) IATA DGR(Dangerous Goods Regulations), latest edition
 - (2) Notice defined in air transport regulations for dangerous goods may cause explosion.
- This instruction established based on the normal use of the battery, without any insurance.