TOOLCRAFT

Material Safety Data Sheet

1. Chemical Product and Company Identification

Product:	Lithium ion rechargeable battery
Nominal voltage:	20 V
Nominal capacity:	2 Ah
Manufacturer:	Conrad Electronic SE
Address:	Klaus-Conrad-Str. 1, D-92240 Hirschau
Telephone:	+49 (0) 9604 / 40 - 8988
Date of issue:	30.09.2019

2. Hazards Identification

Lithium ion cells are not hazardous when used according to the instructions of the manufacturer under normal conditions. In case off abuse, there is a risk of rupture, fire, heat, or leakage of internal components, which could release hazardous materials.

Symptoms Of exposure

Skin contact

No effect under routine handling and use.

Skin absorption

No effect under routine handling and use.

Eye contact

No effect under routine handling and use.

Inhalation

No effect under routine handling and use.

Reported as carcinogen

Not applicable

3. Composition Information

Ingredients	%	CAS no.
Cobalt oxide	<30	1307-96-6
Manganese dioxide	<30	1313-13-9
Nickel oxide	<30	1313-99-1
Carbon	<30	7440-44-0
Polyvinylidene Fluoride (PVDF)	<10	24937-79-9
Aluminum foil	2-10	7429-90-5
Copper foil	2-10	7440-50-8
Electrolyte(*)	<20	/
Aluminium and inert materials	5-10	/

For information purposes: (*) Main ingredients: Lithium hexafluorophosphate, organic carbonates

Because of the cell structure the dangerous inngredients will not be available if used properly. During charge process a lithium graphite intercalation phase is formed.

Mercury content: Hg < 0.1mg/kg

Cadmium content: Cd < 1mg/kg

Lead content: Pb < 10mg/kg

4. First-Aid Measures

Inhalation, Eye contact and Skin contact

Not a health hazard.

Ingestion

If swallowed, obtain medical attention immediately.

<u>If exposure to internal materials within cell due to damaged outer casing, the following actions are recommended:</u>

Inhalation
Leave area immediately and seek medical attention.

Eye contact

Rinse eyes with water for 15 minutes and seek medical attention.

Skin contact

Wash area thoroughly with soap and water and seek medical attention.

Ingestion

Drink milk/water and induce vommiting; seek medical attention.

5. Fire Fighting Measures

General hazard

Cell is not flammable but internal organic material will burn if the cell is incinerated.

Combustion products include, but are not limited to hydrogen fluoride, carbon monoxide and carbon dioxide.

Extinguishing Media

Use extinguishing media suitable for the materials that are burning.

Special Firefighting Instructions

If possible, remove cell(s) from fire fighting area.

If heated above 120°C, cell(s) can explode/vent.

Firefighting Equipment

Use NIOSH/MSHA approved full-face self-contained breathing apparatus (SCBA) with full protective gear.

6. Accidental Release Measures

On Land

Place material into suitable containers and call local fire/police department.

In Water

If possible, remove from water and call local fire/police department.

7. Handling And Storage

Handling

No special protective clothing required for handling individual cells.

Storage

Store in cool, dry place.

8. Exposure Controls/Personal Protection

Engineering Controls

Kepp away from heat and open flame.

Persional Protection

Store in a cool dry place.

Respirator: Not required during normal operations. SCBA required in the event of a fire.

Eye/face protection: Not required beyond safety practices of employer.

Gloves: Not required for handling of cells.

Foot protection: Steeel toed shoes recommended for large container handling.

9. Physical And Chemical Properties

Appearance

Form: Solid

Color: Various

Odor: Odourless

Important health, safety and environmental information

pH Value: N/A

Flash point: N/A

Lower explosion limit: N/A

Vapor pressure: N/A

Density: N/A

Water solubility: Insoluble

Ignition temperature: N/A

10. Stability and Reactivity

Reactivity

None

Incompatibilities

None during normal operation.

Avoid exposure to heat, open flame, and corrosives.

Hazardous Decomposition Products

None during normal operating conditions. If cells are opened, hydrogen fluoride and carbon monoxide may be released.

Conditions to avoid

Avoid exposure to heat and open flame. Do not puncture, crush or incinerate.

11. Toxicological Information

Cells are not hazardous when used properly.

In case of fire or leakage combustion and decomposition products may cause irritation and toxicity to skin, eye and respiratory systems.

Toxicity data of some substance is listed:

Hydrogen fluoride:

Extremely toxic, may be fatal if inhaled or ingested. Readily absorbed through the skin contact may be fatal. Possible mutagen. LCLO: 50 ppm/30m (human beings), LC50: 1276 ppm/1h (rats).

Carbon and graphite:

Slightly hazardous in case of skin contact (irritant), ingestion, inhalation, which will cause chronic damage to upper respiratory tract and cardiovascular system.

Copper:

Dust may cause respiratory irritation. LD50: 3.5 mg/kg (mouse).

12. Ecological Information

Some materials within the cell are bioaccumulative. Under normal conditions, these materials are contained and pose no risk to persons or the surrounding environment.

13. Disposal Information

Recommended methods for safe and environmentally preferred disposal:

Product (waste from residues)

Do not throw out a used battery cell. Recycle it through the recycling company.

Contaminated packaging

Neither a container nor packing is contaminated during normal use. When internal materials leaked from a battery cell contaminates, dispose as industrial waste subject to special control.

Dispose of according to all federal, state, and local regulations.

14. Transporation Information

With regard to transport, the following regulations are cited and considered:

The International Civil Aviation Organization (ICAO) Technical Instructions, Packing Instruction 965, Section I B (2015 Edition)

The International Air Transport Association (IATA) Dangerous Goods Regulations, Packing Instruction 965, Section IB (57th Edition, 2016)

The International Maritime Dangerous Goods (IMDG) Code (2012 Edition)

US Harzardous Materials Regulations 49 CFR (Code of Federal Regulations) Sections 173-185 Lithium battery and cells,

The UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria 38.3

Lithium batteries, Rev.5, Amend.1

UN No. 3480

Our products are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation according to all the applicable international and national governmental regulations, not limited to the abbove mentioned. We further certify that the enclosed products have been tested and fulfilled the requirements and conditions in accordance with UN Recommendations (T1 - T8) on the Transport of Dangerous Goods Model Regulations and the Manual of Tests and Criteria.

Test results of the UN Recommendation on the Transport of Dangerous Goods

Manual of Test and Criteria (38.3 Lithium battery)		**Test result**	**Remark**
No.	**Test items**		
T1	Altitude Simulation	Pass	
T2	Thermal Test	Pass	
T3	Vibration	Pass	
T4	Shock	Pass	
T5	External Short Circuit	Pass	
T6	Impact	Pass	
T7	Overcharge	Pass	For pack and single cell battery only
T8	Forced Discharge	Pass	

15. Regulatory Information

For shipping regulations see section 14.

16. Other Information

The above information is believed to be corect but does not purport to be all inclusive and shall be used only as a guide. The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. We make no warranty, expressed or implied, with respect to this information and disclaims all liabilities from reliance on it.