

Material Safety Data Sheet (GHS)
Issue Date: 2023-06-01

Battery corpuls¹ / corpuls³ (Li-Ion)
Version 2.0

SAFETY DATA SHEET (SDS)

according to

Regulation (EC) No 1907/2006 (REACH), Article 31, State: 2023-06-01

CONTENT (by Sections)

1. Identification
2. Hazards identification
3. Composition/information on ingredients
4. First-aid measures
5. Firefighting measures
6. Accidental release measures
7. Handling and storage
8. Exposure controls/personal protection
9. Physical and chemical properties
10. Stability and reactivity
11. Toxicological information
12. Ecological information
13. Disposal considerations
14. Transport information
15. Regulatory information
16. Other information

Section 1 · IDENTIFICATION

PRODUCT DESCRIPTION

- Battery corpuls3 / corpuls1 (Li-Ion):
Art. No.: 04120.23
- Battery corpuls³ Touch (Li-Ion) 7.4V/5.7Ah/42.2Wh:
Art. No.: 04120.823

PRODUCT NAME

- Li-ion Battery 7,4V 5.7Ah 42.2Wh
- Li-ion Battery c3T 7.4V 5.7Ah 42.2Wh

PRODUCT IDENTIFICATION

Item	Nominal Value
Nominal Voltage	3.67 V
Nominal Capacity	2850 mAh
Lithium Contents	0.86 g
Cell quantity in battery pack	4 pcs.
Designed for Recharge	Yes

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Item	Nominal Value
Cell type	Lithium-ion cell
Cell model name	INR18650 M29

PRODUCT USE

- Battery

NOTE: MSDS are intended for use in the workplace. For domestic-use products, refer to consumer labels.

NOTE: Hazard statement relates to battery contents. Potential for exposure should not exist unless the battery leaks, is exposed to high temperatures or is mechanically, physically or electrically abused.


BASIC INFORMATION

Lithium-ion battery (sometimes Li-ion battery or LIB) are a type of rechargeable battery types in which lithium ions move from the negative electrode to the positive electrode during discharge and back when charging. Li-ion batteries use an intercalated lithium compound as one electrode material, compared to the metallic lithium used in non-rechargeable lithium batteries.

MANUFACTURER / SUPPLIER

	Cell Manufacturer	Supplier	Battery Legal Manufacturer (Supplier of Safety Data Sheet)
Company	LG Chem, Ltd.	TEFAG Elektronik AG	GS Elektromedizinische Geräte G. Stemple GmbH
Address	Hengyi Road, Nanjing Economic & Technological Development Zone, Nanjing, Jiangsu, China	Grossfeldstrasse 5 8887 Mels Switzerland	Hauswiesenstrasse 26 86916 Kaufering Germany

EMERGENCY CONTACT INFORMATION

EMERGENCY CONTACT INFORMATION	
Company	GS Elektromedizinische Geräte G. Stemple GmbH
Address	Hauswiesenstrasse 26 86916 Kaufering Germany
	Tel.: (+49) 8191-65722-0 Fax: (+49) 8191-65722-22

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Section 2 · HAZARDS IDENTIFICATION

Classification of hazardous chemical

Not applicable.

The batteries herein are defined as “articles” under 29 CFR 1910.1200. The batteries are not classified as hazardous according to Regulation (EC) No. 1272/2008.

Classification of Hazard Class

Class 9 – Miscellaneous Dangerous Goods

Hazard Identification

The battery ingredients are contained in a sealed enclosure. Therefore, it is not classified as dangerous or hazardous under normal use. Risk of exposure occurs only if the cell is mechanically, thermally or electrically abused to the point of dismantling the enclosure. If this occurs, exposure to the electrolyte solution within can occur by Inhalation, Ingestion, Eye contact and Skin contact. Damaged or opened cells or batteries may result in rapid heat release, and the release of flammable vapors.

Routes of Entry – Normal use

- Skin contact: No
- Skin absorption: No
- Eye contact: No
- Inhalation: No
- Ingestion: No

Section 3 · COMPOSITION / INFORMATION ON INGREDIENTS

The materials contained in the battery may only become a hazard if the battery cell is disintegrated or if the battery cell is mechanically, thermally or electrically abused.

Ingredients	%	CAS Number
Cobalt lithium manganese nickel oxide	30.00~50.00	182442-95-1
Graphite	10.00~30.00	7782-42-5
1,3-Dioxolan-2-one	10.00~20.00	96-49-1
Aluminium	2.00~10.00	7429-90-5
Copper	2.00~10.00	7440-50-8
Lithium hexafluorophosphate (1-)	~5.00	21324-40-3
1,1-Difluoroethene homopolymer	~5.00	24937-79-9
Ethenylbenzene polymer with 1,3- butadiene	~1.00	9003-55-8

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Section 4 · FIRST AID MEASURES

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

- A. Eye contact
 - Do not rub your eyes
 - Immediately flush eyes with plenty of water for at least 15 minutes and call a doctor / physician
 - Get medical attention immediately
 - Go to the hospital immediately if symptoms (flare, irritate) occur.
 - Remove contact lenses if worn
- B. Skin contact
 - Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes
 - Wash contaminated clothing thoroughly before re-using
 - Get medical attention immediately
 - Remove contaminated clothing, shoes and isolate
 - Wear gloves when washing the patient, and please avoid contact with contaminated clothing
- C. Inhalation contact
 - When exposed to large amounts of steam and mist, move to fresh air
 - Take specific treatment if needed
 - Get medical attention immediately
 - If breathing is stopped or irregular, give artificial respiration and supply oxygen
- D. Ingestion contact
 - Please be advised by doctor whether infusion of vomit is demanded or not
 - Rinse your mouth with water immediately
 - Get medical attention immediately
- E. Delayed and immediate effects and also chronic effects from short and long term exposure
 - Not available
- F. Notes to physician
 - Notify medical personal of contaminated situations and have them appropriate protective measure
 - If exposed or concerned, get medical attention / advise

Section 5 · FIREFIGHTING MEASURES

- A. Suitable (unsuitable) extinguishing media
 - a. Dry chemical, carbon dioxide, regular foam extinguishing agent, spray
 - b. Avoid use of water jet for extinguishing
- B. Specific hazards arising from the chemical
 - a. Not available
- C. Special protective actions for firefighters
 - a. Move containers from fire area, if you can do without the risk
 - b. Cool containers with water until well after fire is out
 - c. Keep unauthorized personnel out
 - d. Use appropriate extinguishing measure suitable for surrounding fire
 - e. Wear appropriate protective equipment
 - f. Keep containers cool with water spray

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Section 6 · ACCIDENTAL RELEASE MEASURES

- A. Personal precautions, protective measures and emergency procedures
- Wear proper personal protective apparatus as indicated in Section 8 and avoid skin contact and inhalation
 - Ventilate closed spaces before entering
 - Must work against the wind, let the upwind people to evacuate
 - Remove all sources of ignition
 - Avoid skin contact and inhalation
 - Cleanup and disposal under expert supervision is advised
 - Keep unauthorized people away, isolate hazard area and deny entry
- B. Environmental precautions
- Prevent runoff and contact with waterways, drains or sewers.
 - If large amounts have been spilled, inform the relevant authorities.
- C. Methods and materials for containment and cleaning up
- Large spill: Stay upwind and keep out of low areas. Dike for later disposal.
 - Notify the central and local government if the emission reach the standard threshold.
 - Disposal of waste shall be in compliance with the Wastes Control Act
 - Appropriate container for disposal of spilled material collected.
 - Avoid entering to sewers or water system.
 - Prevent the influx to waterways, sewers, basements or confined spaces.
 - Spilled material should be treated as a potential risk of waste collected.

Section 7 · HANDLING AND STORAGE

- A. Precautions for safe handling
- Wash thoroughly after handling.
 - Comply with all applicable laws and regulations for handling
 - Get the manual before use.
 - Dealing only with a well-ventilated place.
 - Contaminated work clothing should not be allowed out of the workplace.
- B. Conditions for safe storage, including any incompatibilities.
- Keep in the original container.
 - Please pay attention to incompatibilities materials and conditions to avoid.
 - Keep sealed when not in use.
 - Prevent static electricity and keep away from combustible materials or heat sources.
 - By specifying a storage area for carcinogenic substances.
 - Collected them in sealed containers.
 - Store away from water and sewer.

Section 8 · EXPOSURE CONTROLS / PERSONAL PROTECTION

- A. Exposure limits
 - ACGIH TLV
 - [Cobalt lithium manganese nickel oxide]: TWA 0.1 mg/m³, Nickel Soluble inorganic compounds
 - [Graphite]: TWA, 2mg/m³, Respirable particulate mass
 - [Aluminium]: TWA, 1 mg/m³ (Fume, as Cu), TWA, 1 mg/m³ (Dusts and Mists, as Cu)
 - OSHA PEL
 - [Aluminium]: 15 mg/m³ (Total dust), 5mg/m³ (Respirable fraction)
 - [Graphite]: 15 mppcf (Graphite, Natural) / 15 mg/m³ (Total dust), 5 mg/m³ (Respirable fraction)(Graphite, synthetic)
 - [Cobalt lithium manganese nickel oxide]: 1mg/m³
 - [Copper]: 0.1 mg/m³ (Fume), 1 mg/m³ (Dusts and mists)

- B. Engineering controls
 - Business owner is recommended to maintain below recommended exposure limits for the working place with general exhaust of gas/ vapour/ mist/ fume.

- C. Individual protection measures, such as personal protective equipment
 - Respiratory protection
 - Respiratory protection is ranked in order from minimum to maximum.
 - Consider warning properties before use.
 - Eye protection
 - Wear primary eye protection such as splash resistant safety goggles with a secondary protection face shield.
 - Provide an emergency eye wash station and quick drench shower in the immediate work area.

 - Hand protection
 - Wear appropriate glove.

 - Skin protection
 - Wear appropriate clothing.

 - Others
 - Not available.

Section 9 · PHYSICAL AND CHEMICAL PROPERTIES

A. Appearance	
- Appearance	Other
- Color	Not available
B. Odor	Not available

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C. Odor threshold	Not available
D. pH	Not available
E. Melting point / Freezing point	Not available
F. Initial Boiling Point/ Boiling Ranges	Not available
G. Flash point	Not available
H. Evaporation rate	Not available
I. Flammability (solid, gas)	Not available
J. Upper/ Lower Flammability or explosive limits	Not available
K. Vapour pressure	Not available
L. Solubility	Not available
M. Vapour density	Not available
N. Specific gravity (Relative density)	Not available
O. Partition coefficient of n-octanol/ water	Not available
P. Autoignition temperature	Not available
Q. Decomposition temperature	Not available
R. Viscosity	Not available
S. Molecular weight	Not available

Section 10 · STABILITY AND REACTIVITY

- A. Chemical Stability
- This material is stable under recommended storage and handling conditions.
- B. Possibility of hazardous reactions
- Hazardous Polymerization will not occur.
- C. Conditions to avoid
- Avoid contact with incompatible materials and condition.
 - Avoid: Accumulation of electrostatic charges, Heating, Flames and hot surfaces
- D. Incompatible materials
- Not available
- E. Hazardous decomposition products
- May emit flammable vapour if involved in fire.

Section 11 · TOXICOLOGICAL INFORMATION

- A. Information on the likely routes of exposure
- (Respiratory tracts)
 - Not available
 - (Oral)
 - Not available
 - (Eye-Skin)
 - Causes serious eye irritation

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- B. Delayed and immediate effects and also chronic effects from short and long term exposure
- Acute toxicity
 - Oral
 - Product (ATEmix): 2000mg/kg < ATEmix <= 5000mg/kg
 - [Cobalt lithium manganese nickel oxide]: LD50 > 2000 mg/kg Rat (NICNAS)
 - [Graphite]: LD50 > 2000mg/kg Rat (OECD Guideline 423, GLP)
 - [1,3-Dioxolan-2-one]: LD50 = 10000 mg/kg Rat (NLM)
 - [Aluminium]: LD50 > 15900 mg/kg (OECD TG 401)
 - [Copper]: LD50 481 mg/kg Rat (OECD TG 401, GLP)
 - Dermal
 - Product (ATEmix): >5000mg/kg
 - [1,3-Dioxolan-2-one]: LD50 > 3000 mg/kg Rabbit (NLM)
 - [Copper]: LD50 > 2000 mg/kg Rat (OECD TG 402, GLP)
 - Inhalation
 - Product (ATEmix): Not available
 - [Cobalt lithium manganese nickel oxide]: 0.05 < LC50 <= 0.5mg/L/4hr
 - [Graphite]: Dust LC50 > 2mg/ (4hr Rat (OECD Guideline 403, GLP) (No deaths, not classified (ECHA))
 - [Aluminium]: Dust LC50 > 0.888 mg/ l 4hr Rat (OECD TG 403, GLP)
 - [Copper]: LC50 > 5.11 mg/ l 4hr Rat (OECD TG 436, GLP)
 - Skin corrosion/ irritation
 - Not available
 - Serious eye damage/ irritation
 - Causes serious eye irritation
 - Respiratory sensitization
 - Not available
 - Skin sensitization
 - Not available
 - Carcinogenicity
 - IARC
 - [Ethenylbenzene polymer with 1,3-butadiene]: Group 3
 - OSHA
 - Not available
 - ACGIH
 - [Lithium hexafluorophosphate(1-)]: A4 (Flourides)
 - [1,1-Difluoroethene homopolymer]: A4 (Flourides)
 - [Aluminium]: A4
 - NTP
 - Not available
 - EU CLP
 - Not available

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- Germ cell mutagenicity
 - Not available
- Reproductive toxicity
 - Not available
- STOT-single exposure
 - Not available
- STOT-repeated exposure
 - May cause damage to organs through prolonged or repeated exposure (Refer Section SDS 11)
- Aspiration hazard
 - Not available

Section 12 · ECOLOGICAL INFORMATION

A. Ecotoxicity

- Fish
 - [Cobalt lithium manganese nickel oxide]: LL50 > 100mg/l 96 hr Pimephales promelas (NICNAS)
 - [Graphite]: LC50 > 100 mg/l 96 hr (Danio rerio (OECD Guideline 203, GLP)
 - [1,3-Dioxolan-2-one]: LC50 = 238.065 mg/l 96 hr (Estimate)
 - [Copper]: LC50 0.286mg/l 96 hr Oncorhynchus mykiss (L50 0.28640 % sewage treatment plant effluent, 0.164 river water mg/l 96 hr)
- Crustaceans
 - [Cobalt lithium manganese nickel oxide]: EL50 > 100 mg/l 48 hr Daphnia magna (NICNAS)
 - [Graphite]: EC50 > 100 mg/l 48 hr Daphnia magna (OECD Guideline 202, GLP)
 - [1,3-Dioxolan-2-one]: LC50 = 9423.147 mg/l 48 hr Daphnia magna
 - [Copper]: LC50 0.0338 mg/l ~0.792 mg/l 48 hr Daphnia magna (OECD TG 202)
- Algae:
 - [Cobalt lithium manganese nickel oxide]: ErC50 > 100 mg/l 72 hr (Pseudokirchneriella subcapitata) (NICNAS)
 - [Graphite]: ErC50 > 100 mg/l 72 hr (Pseudokirchneriella subcapitata), (OECD Guideline 201, GLP)
 - [1,3-Dioxolan-2-one]: EC50 = 17.388 mg/l 96 hr (Estimate)
 - [Copper]: NOEC 0.708 mg/l ~ 0.0376 mg/l 72 hr (Phaeodactylum tricorutum: NOEC = 0.0376 – 0.708 mg/l 72 hr, OECD TG)

B. Persistence and degradability

- Persistence
 - [1,3-Dioxolan-2-one]: log Know = -0.340 (NLM/HSDB)
 - [Copper]: log Know = -0.57 (Estimate)
- Degradability
 - Not available

C. Bioaccumulative potential

- Bioaccumulative potential
 - [1,3-Dioxolan-2-one]: BCF=3.2 (NLM/HSDB)

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- [Copper]: BCF = 5830
- Biodegradation
 - Not available

D. Mobility in soil

- [1,3-Dioxolan-2-one]: Koc = 9.2

E. Other adverse effects

- Not available

Section 13 · DISPOSAL CONSIDERATIONS

General:

- Dispose of batteries according to local regulations.
- The cell should be disposed with a discharged state to avoid heat generation by an inadvertent short-circuit.
- If batteries are still fully charged or only partially discharged, they can be considered a reactive hazardous waste

because of significant amount of unconsumed energy remaining in the spent battery. The battery must be neutralized through an approved secondary treatment facility prior to disposal as a hazardous waste (or discharged appropriately). Recycling of battery can be done in authorized facility, by a licensed waste carrier.

A. Disposal methods

- Stabilization and minimization treatment by incineration or similar method can be applied, if more than two kinds of designated wastes are in mixture state and it is impractical to separate them
- Oil water separation technology shall be applied as pre-waste treatment if it is applicable
- It shall be treated by incineration

B. Special precautions for disposal

- Anyone with business license number who generates industrial wastes shall treat the waste by him/herself or by entrusting to the legal entities who treat the wastes, recycle the wastes of others of install and operate the waste treatment facilities according to the Wastes Control Act
- Dispose of waste in accordance with all applicable laws and regulations.

Section 14 · TRANSPORTATION INFORMATION

Proper shipping name and UN No.:

- UN3481: Lithium Ion Batteries packed with / contained in equipment
- UN3480: Lithium ion batteries

Classification of Hazard Class: Class 9 – Miscellaneous Dangerous Goods**Packing instructions / special provisions:**

- The International Air Transport Association (IATA) Dangerous Goods Regulations
Packing Instruction: 965 - 967

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- The International Maritime Dangerous Goods (IMDG) Code
Special Provision: 188
- The European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR)
Special Provision: 188

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 Testes and Criteria that can be treated as “Non-Dangerous Goods”.

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

Manual of Test and Criteria (38.3 Lithium battery)		Test results	Remark
No	Test item		
T1 (38.3.4.1)	Altitude Simulation	Pass	
T2 (38.3.4.2)	Thermal Test	Pass	
T3 (38.3.4.3)	Vibration	Pass	
T4 (38.3.4.4)	Shock	Pass	
T5 (38.3.4.5)	External Short Circuit	Pass	
T6 (38.3.4.6)	Impact	Pass	For cell only
T7 (38.3.4.7)	Overcharge	Pass	For pack only
T8 (38.3.4.8)	Forced discharge	Pass	For cell only

Section 15 · REGULATORY INFORMATION

Major applicable regulations for the transportation of lithium-ion cells and batteries are as follows:

- The International Civil Aviation Organization (ICAO) Technical Instructions
- The International Air Transport Association (IATA) Dangerous Goods Regulations
- The International Maritime Dangerous Goods (IMDG) Code
- The European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR)
- The US Hazardous Materials Regulations (HMR) pursuant to a final rule issued by RSPA (CFR 49 Parts 100-185)
- The Office of Hazardous Materials Safety within the US Department of Transportation’s (DOT) Research and Special Programs Administration (RSPA), and
- The UN Recommendations on the Transport of Dangerous Goods Model Regulations and the Manual of Tests and Criteria.

OSHA hazard communication standard (29 CFR 1910.1200): Non-hazardous

Section 16 · OTHER INFORMATION**Legal Manufacturer Disclaimer**

The information contained herein is based on the data available to us and believed to be correct. However, **GS Elektromedizinische Geräte G. Stemple GmbH** makes no warranty, expressed or implied. Users should consider the

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data only as a supplement to other information gathered by them and must make independent determinations of the suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers.

Legal remark (EU)

These batteries are no “substances” or “mixtures” according to Regulation (EC) No 1907/2006 EC. Instead they have to be regarded as “articles”, no substances are intended to be released during handling. Therefore there is no obligation to supply a “safety data sheet according to Regulation (EC) 1907/2006, Article 31”.