SAFETY DATA SHEET (SDS)

according to

Regulation (EC) No 1907/2006 (REACH), Article 31

CONTENT (by Sections)

Section 1 · IDENTIFICATION

PRODUCT DESCRIPTION
Battery corpuls3 / corpuls1 (Li-Ion):
Art. No.: 04120.21 and 04120.22

PRODUCT NAME
Li-Ion Battery 7,4V 4,4Ah 32,6Wh

PRODUCT IDENTIFICATION

Item	Nominal Value
Nominal Voltage	3.6 V
Nominal Capacity	2200 mAh
Lithium Contents	0.66 g
Cell quantity in battery pack	4 pcs.
Designed for Recharge	Yes
Cell type	Lithium-ion cell
Cell model name	ICR18650-22F

Material Safety Data Sheet (GHS)
Issue Date: 2018-12-17

Battery corpuls[1] / corpuls[3] (Li-Ion)
Version 2.2

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	Samsung SDI Corporation	TEFAG Elektronik AG	GS Elektromedizinische Geräte G. Stemple GmbH
Address	508 Sungsung-Dong Cheonan City Chungchongnam-Do Korea	Grossfeldstrasse 5 8887 Mels Switzerland	Hauswiesenstrasse 26 86916 Kaufering Germany

EMERGENCY CONTACT INFORMATION

EMERGENCY CONTACT INFORMATION		
Company	Samsung SDI Headquarter	GS Elektromedizinische Geräte G. Stemple GmbH
Address	575 Shin-dong, Yeongtong-Gu Suwon, Gyeonggi-Do Korea	Hauswiesenstrasse 26 86916 Kaufering Germany
	Tel: (+82) 31-210-7114 Fax: (+82) 31-201-7146	Tel.: (+49) 8191-65722-0 Fax: (+49) 8191-65722-22

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
Aluminium Foil	2-10	7429-90-5
Metal Oxide (proprietary)	20-50	Confidential
Polyvinylidene Fluoride (PVDF)	< 5	24937-79-9
Styrene Butadiene Rubber (SBR)	< 5	9003-55-8
Copper Foil	2-10	7440-50-8
Carbon (proprietary)	10-30	7440-44-0
Electrolyte (proprietary)	10-20	Confidential
Aluminium and inert materials	Remainder	N/A

Section 4 · FIRST AID MEASURES

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

After inhalation
Leave area immediately and seek medical attention.

After contact with skin
Wash area thoroughly with soap and water and seek medical attention.

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

After ingestion
Drink milk/water and induce vomiting; seek medical attention.

Section 5 · FIREFIGHTING 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 firefighting area. If heated above 125°C, cell(s) can explode/vent.

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

Section 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.

Section 7 · HANDLING AND STORAGE

Handling
No special protective clothing required for handling individual cells.

Storage
Store in a cool, dry place.

Section 8 · EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls
Keep away from heat and open flame. Store in a cool dry place.

Personal protection

- 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: Steel toed shoes recommended for large container handling.

Section 9 · PHYSICAL AND CHEMICAL PROPERTIES

State: Solid

Odor: N/A

pH: N/A

Vapor pressure: N/A

Vapor density: N/A

Boiling point: N/A

Solubility in water: Insoluble

Specific gravity: N/A

Density: N/A

Section 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.

Section 11 · TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

This product does not elicit toxicological properties during routine handling and use.

Sensitization: NO	Teratogenicity: NO	Reproductive toxicity: NO	Acute toxicity: NO

This product does not contain any kinds of the following substances and halogen-type flame retardants including Chlorine and Bromide type harmful flame retardants which are listed in Appendix of TCO documents and relevant international ECO requirements:

- Polybromated Biphenyls (PBB)
- Polybromated Biphenyl Ethers (PBBE)
- Polybromated Biphenyl Oxides (PBBO)
- Polybromated Diphenylethers (PBDE)
- Polychlorinated Biphenyl (PCB)
- Polychloronated Diphenylethers (PCDE)
- Tetrabromphisphenol A (TBBPA)
- Asbestos, Antimonytrioxide, Dioxine

None of the following substances will be exposed, leaked, or emitted during transportation, storage or any operation and any temperature condition:

- Chlorinated Fluorohydrocarbon (FCKW)
- Acrylonitride
- Styrol

- Phenol
- Benzol
- Mercury of greater than 0.0001 wt% for alkaline battery
- Mercury of greater than 0.0005 wt% for other battery
- Lithium content of greater than 0.5g/cell, 1.5g/battery
- Cadmium, lead, and other harmful heavy metal

This product does not contain mercury, cadmium and lithium-metal.

Mercury content: N/A

Lithium-metal: N/A

Cadmium content: N/A

If the cells are opened through misuse or damage, discard immediately. Internal components of cell are irritants and sensitizers.

Section 12 · ECOLOGICAL INFORMATION

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

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.

CALIFORNIA REGULATED DEBRIS

RCRA Waste Code: Non-regulated

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

Section 14 · TRANSPORTATION INFORMATION

Proper shipping name: Lithium Ion Batteries packed with / contained in equipment

UN No.: UN3481

Classification of Hazard Class: Class 9 – Miscellaneous Dangerous Goods

Packing instructions / special provisions:

- The International Air Transport Association (IATA) Dangerous Goods Regulations
  Packing Instruction: 966 - 967
- 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	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 only
T8	Overcharge	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 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".