

**SAMSUNG SDI****MATERIAL SAFETY DATA SHEET**

1. PRODUCT / COMPANY IDENTIFICATION**PRODUCT IDENTIFICATION****Samsung SDI Lithium-Ion Battery****Samsung SDI AS10D61**

Item	Nominal Value	Remark
Wh-capacity	48 Wh	< 100Wh(Pack)

MANUFACTURER

Samsung SDI Co., Ltd

508 Sungsung-Dong Cheonan-Shi

Chungcheongnam-Do, Korea

Tel: 82-70-7125-1837 Emergency Contact(Chemtrec) 1-800-424-9300: US and Canada

1-703-527-3887: International

2. COMPOSITION INFORMATION

INGREDIENTS	%	CAS NUMBER
Aluminum 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
Aluminum and inert materials	Remainder	N/A

3. HAZARDS IDENTIFICATION**PRIMARY ROUTES OF ENTRY**

Skin contact, Skin absorption, Eye contact, Inhalation, and Ingestion : NO

SYMPTOMS OF EXPOSURE

Skin contact, Skin absorption, Eye contact, Inhalation

→ No effect under routine handling and use.

REPORTED AS CARCINOGEN**NOT APPLICABLE**

This Sheet is provided as technical information only. The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. SAMSUNG SDI Corp. makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities from reliance on it

4. FIRST AID MEASURES

INHALATION, EYE CONTACT, and SKIN CONTACT: Not a health hazard.

INGESTION

If swallowed, obtain medical attention immediately.

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

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 vomiting; 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 125°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

This Sheet is provided as technical information only. The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. SAMSUNG SDI Corp. makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities from reliance on it

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 a cool, dry place.

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.

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		

10. STABILITY AND REACTIVITY

REACTIVITY

None

INCOMPATIBILITIES

None (during normal operation). Avoid exposure to heat, open flame, and corrosives.

HAZARDOUS DECOMPOSITION PRODUCTS

This Sheet is provided as technical information only. The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. SAMSUNG SDI Corp. makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities from reliance on it

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

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)
Polychlorinated Diphenylethers	(PCDE)
Tetrabromophenol 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)
Acrylonitrile	
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.

This Sheet is provided as technical information only. The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. SAMSUNG SDI Corp. makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities from reliance on it

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 CONSIDERATION

CALIFORNIA REGULATED DEBRIS

RCRA Waste Code: Non-regulated

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

14. REGULATORY INFORMATION

OSHA hazard communication standard (29 CFR 1910.1200)

☐ Hazardous ☒ Non-hazardous

15. TRANSPORT INFORMATION

The rechargeable Lithium-Ion battery pack as stated in Appendix are made in compliance to the requirements stated in the latest edition of the IATA Dangerous Goods Regulations Packing Instruction 965 Part 1 such that they can be transported as a NOT RESTRICTED (non-hazardous/non-dangerous) goods. However, if those lithium-ion battery packs are pack with or contained in an equipment, then it is the responsibility of the shipper to ensure that the consignment are packed in compliance to the latest edition of the IATA Dangerous Goods Regulations Part 1 section of either Packing Instruction 966 or 967 in order for that consignment to be declared as NOT RESTRICTED (non-hazardous/non-Dangerous).

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

- The International Civil Aviation Organization (ICAO) Technical Instructions (2009-2010 Edition),
- The International Air Transport Association (IATA) Dangerous Goods Regulations (50th Edition)
- The International Maritime Dangerous Goods (IMDG) Code (2008 Edition),
- US Hazardous Materials Regulations 49 CFR (Code of Federal Regulations) Sections 173-185 Lithium batterie and cells,

This Sheet is provided as technical information only. The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. SAMSUNG SDI Corp. makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities from reliance on it

- The UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria 38.3 Lithium batteries, 4th revised edition(UN3480)

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 above 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 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	Forced Discharge	Pass	For cell only

16. OTHER INFORMATION

For further information, please contact SAMSUNG SDI sales representative.

This Sheet is provided as technical information only. The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. SAMSUNG SDI Corp. makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities from reliance on it