Gas Measurement Instruments Ltd

Safety Data Sheet

SDS No. 025 Version 4.2 Revised Date: 05/01/2016

1. Identification of the substance/mixture and of the company/undertaking:

1.1. Product identifier: Polymer Lithium Ion Battery

Part No: 64321.

Battery for PS200.

1.2. Relevant identified uses of the substance or mixture and uses advised against:

Industrial and professional use only. Do not dismantle battery.

Details of the supplier of the safety data sheet, company identification:

Gas Measurement Instruments Ltd
Inchinnan Business Park
Renfrew
PA4 9RG
Contact No: 0141 812 3211
Email address: sales@gmiuk.com

1.3. Emergency contact details:

Opening hrs: 9:00 a.m -5:00 p.m
Contact No: 0141 812 3211

2. Hazards Identification:

2.1. Classification of the substance and mixture:

All chemical materials of lithium ion battery cell are stored in a hermetically sealed metal case which is designed to withstand temperatures and pressures encountered during normal use. There is no physical danger of ignition or explosion and chemical danger of hazardous materials' leakage during normal use.

Risk advice to man and the environment:

If the battery is misused, dismantled and comes in contact with fire, electric stress, mechanical stress, hazardous materials released could ignite.

Potential Health Effects:

Cobalt and Cobalt compounds are considered to be possible human carcinogen(s). These chemicals may cause allergic skin sensitization (rash) and irritate eyes, skin, nose, throat, respiratory system. Electrolyte in the battery may cause moderate to severe eye irritation, dryness of the skin. Breathing fumes from battery fire may irritate the nose, throat and lungs. Exposure of electrolyte material in the area which contains water may generate hydrofluoric acid. Hydrofluoric acid can cause severe skin and eye burns. The ingestion of electrolyte can cause serious chemical burns to the mouth, oesophagus and gastrointestinal tract.

2.2. Label elements: Hazard pictograms:

Signal word- Warning

Precautionary Statements:

Precautionary Statement Prevention:

P103 Read Label before use.

P210 Keep away from heat/sparks/open flames/hot surfaces – No Smoking.

P234 Keep only in original container.

P273 Avoid release to the environment.

2.3. Other Hazards:

If the battery is misused, dismantled and is in contact with fire, electric stress, mechanical stress; it may ignite. Gases such as carbon dioxide, carbon monoxide may be released during combustion of the product.

3. Composition/information on ingredients:

Substance/ Mixture: Mixture

Components	CAS No	Concentration
Lithium Cobalt Dioxide	12190-79-3	25- 40%
Aluminium foil	7429-90-5	2-6 %
Graphite (various Carbons)	7782-42-5	11-21 %
Copper foil	7440-50-8	6-16 %
Organic electrolyte		8-18 %
Lithium hexafluorophoshate	21324-40-3	1-4 %
Steel and inert components	7439-89-6	Balance
Equivalent Max Lithium Content	7439-93-2	0.95g/pcs

Independent Certification of Lithium-Ion cell UN Transportation Model Regulation. Product has been tested based on the UN Manual of Tests and Criteria 383.

Altitude simulation: passed.

Thermal test: passed.

Vibration: passed.

Shock: passed.

External short circuit: passed.

Impact: passed.

Overcharge: passed.

Forced discharge: passed.

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4. First Aid Measures :

4.1. Skin contact/ Eye contact:

Flush with water for at least 15 minutes. In case irritation persists seek medical aid.

Ingestion: Ingestion is not considered a potential route of exposure.

Inhalation:

In case of shortness of breath, give oxygen. Move to fresh air. If breathing has stopped or is labored, give assisted respiration. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately. Seek medical advice.

4.2. Most important symptoms and effects, both acute and delayed: No data available.

4.3. Indication of any immediate medical attention and special treatment needed:

No data available.

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5. Fire- fighting measures:

5.1. Extinguishing media:

Suitable extinguishing media: use extinguishing media appropriate for surrounding fire. For small fire use dry chemical, fog, foam or water

5.2. Special hazards arising from the substance or mixture:

If in fire, the battery may release toxic gases such as carbon monoxide and carbon dioxide.

5.3 Advice for fire-fighters:

Special protective equipment for fire-fighters: Normal firefighters' equipment consists of an appropriate SCBA (open-circuit positive pressure compressed air type) in combination with fire kit. Equipment and clothing to the following standards will provide a suitable level of protection for firefighters.

Guideline: EN 137 Respiratory protective devices — Self-contained open circuit compressed air breathing apparatus with full face mask — Requirements, testing, marking., EN 15090 Footwear for firefighters., EN 443 Helmets for firefighting in buildings and other structures. EN 469:2005: Protective clothing for firefighters. Performance requirements for protective clothing for firefighting. EN 659 Protective gloves for firefighters.

6. Accidental release measures:

6.1. Personal precautions, protective equipment and emergency procedures:

None if the battery is not dismantled.

6.2. Environmental precautions:

Batteries should not be allowed to enter drains and general waste.

6.3 Methods and material for containment and cleaning up: If battery is leaking, approach suspected leak with caution.

6.4 Reference to other sections: See sections 8 and 13.

7. Handling and Storage:

7.1. Precautions for safe handling:

Do not store battery near heat sources or exposure to direct sunlight. Do not throw batteries in fire and keep away from strong oxidizers. Do not wash battery in water or sea water. Do not dismantle the battery under any circumstances. Do not overcharge batteries. If the electrolyte is leaking from the battery, wear protective equipment. Do not handle a leaking battery without safety gloves. Hazardous materials such as the lithium compounds can result in skin sensitisation.

7.2. Conditions for safe storage, including any incompatibilities:

Battery should not be exposed to high temperatures and mechanical shocks. Exposure to direct sunlight will cause damage to the battery. Store in cool place and normal humidity conditions (45% - 75%). Care should be taken to avoid short circuit.

7.3. Specific end use(s): Refer to section 1 or the extended SDS if applicable.

8. Exposure controls / personal protection:

8.1 Workplace Exposure Limits=

ACGIH: American Council of Government Industrial Hygienists.

TLV: Threshold Limit Value are Personal exposure limit determined by ACGIH

Components	**CAS No**	**ACGIH-TLV☆**
Lithium Cobalt Dioxide	12190-79-3	0.02mg/m3 (Co, TWA)
Aluminium foil	7429-90-5	
Graphite (various Carbons)	7782-42-5	2mg/m3 (Soluble salts, TWA)
Copper foil	7440-50-8	2mg/m3 (Dust, TWA)
Organic electrolyte		0.2mg/m3 (Fume, TWA)
Lithium hexafluorophoshate	21324-40-3	2.5mg/m3 (F, TWA)

8.2 Exposure controls:

Appropriate engineering controls:

A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product. General hygiene practices should be followed. Hands should be washed after using the battery. In case of a leaking battery, do not touch without safety gloves.

Personal protective equipment:

Eye and face protection: Wear protective gloves when handling the battery- nitrile gloves.

If in case of a leaking, fuming electrolyte, wear a face-shield (EN166) if there is potential for the battery to explode.

Safety Gloves: Nitrile gloves can be used to handle the battery.

Respiratory protection:

Keep self-contained breathing apparatus readily available for emergency use., Use SCBA in the event of high concentrations, The selection of the Respiratory Protective Device (RPD) must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected RPD., When allowed by a risk assessment Respiratory Protective Equipment (RPE) may be used.

Guideline: EN136 Respiratory protective devices. Full face masks.

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9. Physical and chemical properties:

9.1 Information on basic physical and chemical properties: None

(a/b) **Physical state/Colour**: None
(c) **Odour**: None
(d) **Relative Density Gas** : None
(e) **Melting point / freezing point**: None
(f) **Boiling point/range**: -None
(g) **Vapour pressure 20^{o}C**: None
(h) **Water solubility**: None
(i) **Partition coefficient (n-octanol/water**): None
(j) **pH**: None
(k) **Viscosity**: None
(l) **Particle characteristics**: None
(m) **Lower and upper explosion/ flammability limits**: None
(n) **Critical Temperature:** None

9.2. Other information:

Explosive properties: No data available.
Oxidizing properties: No data available.
Molecular Weight: None
Odour threshold: No data available

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10. Stability and reactivity:

10.1. Reactivity: Unreactive under normal conditions.

10.2. Chemical stability: Stable under normal conditions.

10.3. Possibility of hazardous reactions:

Can explode or cause fire if exposed to high temperatures, in contact with oxidisers or acids.
10.4. Conditions to avoid:
Keep away from heat/sparks/open flames/hot surfaces. No smoking. Do not tamper with the battery.
10.5. Incompatible materials: Oxidising agents, acids, water.
10.6. Hazardous decomposition products:
Under normal conditions of storage and use, hazardous decomposition products should not be produced.

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11. Toxicological information:

11.1. Information on toxicological effects:

Acute inhalation toxicity Value: None under normal use.
Skin irritation: None
Sensitization: None under normal use, leaking electrolyte may cause skin sensitisation.
Repeated dose toxicity: None under normal use.
Assessment mutagenicity: None under normal use.
Assessment carcinogenicity: None under normal use.
Toxicity to reproduction/fertility: None under normal use.
Developmental toxicity/teratogenicity: None under normal use.
Specific Target Organ Toxicity (STOT) - Repeated Exposure: None under normal use.

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12. Ecological information:

12.1 Toxicity:
No known ecological damage caused by this product**.**
Acute and prolonged toxicity: Not applicable
Toxicity: Not applicable
12.2. Persistence and degradability: Not applicable.
12.3. Bioaccumulative potential: Not applicable.
12.4. Mobility in soil: Not applicable.
12.5. Results of PBT and vPvB assessment: Not applicable.
12.6. Other adverse effects: Not applicable
12.7 Effect on the ozone layer:
Ozone Depleting: No data available.
Global Warming Potential:
Refer to the Intergovernmental Panel on Climate Change (IPCC) for the latest Direct Global Warming Potential Values.

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13. Disposal Considerations:

13.1 Waste treatment methods:

Follow national, regional and local waste management regulations. Do not throw into water or general waste. Batteries are to be recycled and treated under the Waste Electrical Electronic Equipment Directive. Batteries should be separated from other electronics so as to avoid contamination of other WEEE products. Contact you Waste Management Company to deal with leaking batteries.

List of hazardous waste codes: EWC code 20 01 33-Industrial use of batteries

Contaminated packaging: Contact supplier.

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14. Transport information:

ADR

US DOT:

All EV batteries are not subject to the requirements of the Department of Transportation (DOT) subchapter C, Hazardous Material Regulations since each EV battery meets the exceptions under 173.185 (b). The EV batteries are exempted from the US DOT regulations as long as they are separated to prevent short circuits and packed in strong packing for conditions normally encountered in transportation.

ICAO and IATA:

UN3481

PI 967

Section II

IMP: ELI

All EV batteries are regulated as Hazardous Material by the International Civil Aviation Organization (ICAO) an International Air Transport Association (IATA) when transporting more than 24 batteries or 12 batteries in a single package. They must be transported in accordance with IATA 2016 Dangerous Goods Regulations Section II of Packing Instruction -- "PI965".

IMO:

All EV batteries are regulated as Hazardous Material by the International Maritime Organization (IMO) when transporting more than 24 batteries or 12 batteries in a single package. These must be transported according to the requirement in Special Provisions "188" and "230".

ADR, RID:

All EV batteries are regulated as Hazardous Material by the ADR (road) and RID (rail) when transporting more than 24 batteries or 12 batteries in a single package. These must be transported according to the requirement in Special Provisions "188" and "230".

Please refer to the IATA- Lithium Battery Guidance Document for detailed information on the testing, packaging requirements. The transportation information is not intended to

convey all specific regulatory data relating to this material. For complete transportation information, contact GMI customer service representative at 0141 812 3211.

15. Regulatory information:

ACGIH and OSHA: see exposure limits of the internal ingredients of the battery in section 8.1
IATA.ICAO(air transportation): UN3481
IMDG(sea transportation): UN3481
Transportation within the US-DOT,49 Code of Federal Regulations

END OF DOCUMENT