

**SAFETY DATA SHEET**

Product: LITHIUM ION BATTERY IN EQUIPMENT (RADII PLUS, RADII CAL)

Date / Revised: 12.05.2015

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Revision: 3

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

1.1 Product identifier:

Product Names: Lithium-ion battery in equipment – Radium Plus and Radium Cal

1.2 Relevant identified use:

Relevant use: Battery in Radium Plus and Radium Cal, to be used as dental curing lights.

Further information:

Battery System: Lithium-ion (Li-ion) battery pack.
Nominal voltage: 7.4V
Rated Capacity: 1550mAh
Wh rating: 11.47 Wh

1.3 Details of the supplier of the Safety Data Sheet:

Manufacturer / SupplierSDI Limited
3-13 Brunson Street, Bayswater
Victoria, 3153, AustraliaSDI (North America) Inc.
1279 Hamilton Parkway
Itasca, IL 60143, USA**Telephone:**

+61 3 8727 7111 (Business hours)

Telephone:

+1 630 361 9200 (Business hours)

Southern Dental Industries Ltd
Block 8, St Johns Court
Swords Road
Santry, Dublin 9, IrelandSDI Brasil Indústria e Comércio Ltda
Rua Dr. Virgílio de Carvalho Pinto, 612
Pinheiros, São Paulo, 05415-020
Brasil**Telephone:**

+353 1 886 9577 (Business Hours)

Telephone:

+ 55 11 3092 7100 (Business Hours)

Emergency contact number:

+61 3 8727 7111

Email: ray.cahill@sdi.com.au (Technical Director, SDI Limited)**2. Hazard Identification**

Not classified as hazardous according to the Globally Harmonised System for classification and labelling of chemicals (GHS). No effect on skin contact, skin absorption, eye contact and inhalation under routine handling and use.

Potentially hazardous materials are sealed and contained in equipment. Equipment is packed in strong outer packaging to withstand normal handling and use. Exposure could occur if the equipment has been exposed to high temperatures (>125°C), battery or cells have been opened, crushed, disassembled or burned. Keep away from heat.

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3. Composition / Information on ingredients

Battery Cell:

Components	Content (wt %)	CAS number
Lithium Cobalt Dioxide (LiCoO ₂)	Less than 38 wt %	12190-79-3
Lithium Hexafluorophosphate (LiPF ₆)	Less than 3 wt %	21324-40-3
Ethylene Carbonate (C ₃ H ₄ O ₃)	Less than 6 wt %	96-49-1
Chain carbonate (-)	Less than 8 wt %	
Graphite (C)	Less than 20 wt %	7782-42-5
Lead (Pb)	Less than 0.1 wt % (1000ppm)	
Mercury (Hg)	Less than 0.0005 wt % (5ppm)	

Note: other 25% includes the below materials:

- Al (positive Base Film, Cap, Can, Tab)
- Cu (Negative film base)
- Ni (Tab, Terminal)
- Fe (Terminal)
- Resin (PP, PE, PET) (Separator, Plastic, Parts, Insulator)

Circuit Module:

Hazardous ingredients	%	CAS number
Lead	< 0.1	7439-92-1
Mercury	0	7439-97-6
Chromium	0	7440-47-3
Cadmium	0	7440-43-9
Plastic case and SiO ₂	0	N/A

Plastic Parts and Paints:

Ingredients	%	CAS number
Polycarbonate	More than 81 wt%	25971-63-5
Flame retardant	Less than 12 wt%	
Elastomer	Less than 7 wt%	



4. First Aid Measures

Intact/undamaged cell (battery pack):

- Inhalation, eye contact and skin contact: Not a health hazard.
- Ingestion: If swallowed, obtain immediate medical attention.

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

- Ingestion: Drink milk/water and induce vomiting. Seek immediate medical attention.
- Skin: Wash skin thoroughly with soap and water and seek medical attention.
- Eye: Rinse eyes with water for 15 minutes and seek medical attention.
- Inhalation: Leave area immediately and seek medical attention.

Most important effects, acute and delayed:

The most important known symptoms and effects are described in section 2 and/or in section 11.

Indication of any immediate medical attention and special treatment needed: No data available.

5. Fire Fighting Measures

General Hazard:	Cell is not flammable but internal organic material will burn if the cell is incinerated.
Suitable extinguishing media:	Carbon dioxide, foam, dry chemical extinguishing media or water spray.
Unsuitable extinguishing media:	No data available.
Specific hazards arising from the mixture:	This product will burn under fire conditions. Combustion products include but are not limited to hydrogen fluoride, carbon monoxide and carbon dioxide. If possible, remove cells from fire fighting area. If heated above 125°C, cells can explode/vent.
Advice for firefighters:	Use NIOSH/MSHA approved full-face self-contained breathing apparatus (SCBA) with full protective gear.



6. Accidental Release Measures

Personal precautions:	Use personal protective equipment to avoid contact & exposure. Remove all metal objects including jewellery, belts, etc before handling battery. Remove all sources of ignition. Ensure adequate ventilation. For personal protection, see section 8.
Environmental precautions:	Prevent any spillage from entering drains or waterways.
Method for Cleaning and containment of Spills:	For small spills, use paper towel or dry cloth to absorb electrolyte spill. For larger spills, clean up spill using an inert absorbent material such as dry sand or vermiculite. Place in appropriate container for disposal in accordance with local regulations. Clean up area with soap and water, and collect material for subsequent disposal. Do not allow to enter drains or waterways.

Removal of ignition sources, provision of sufficient ventilation, control of dust: Not expected.

7. Handling and storage

<u>Precautions for safe handling:</u>	Do not damage, disassemble or open the battery. Keep away from heat and fire.
<u>Conditions for safe storage, including any biocompatibilities:</u>	Store in a cool, dry, well-ventilated place. The packed battery should not be exposed to high temperatures (>60°C or 140°F), opened, crushed, dissembled or burned.
Specific end use:	Apart from the use mentioned in section 1.2, there are no other uses for the product.

8. Exposure controls and personal protection

Engineering controls:	Keep away from heat and open flame. Store in a cool dry place.
Occupational Exposure Limits:	We are not aware of any national exposure limit.
Exposure controls: Respiratory protection:	None required under normal conditions of use. SCBA required in the event of a fire.
Hand protection:	Gloves not required for handling of cells.
Eye / face protection:	None required under normal conditions of use.
Foot protection:	Steel toed shoes recommended for large container handling.

No personal protection is required for the normal handling of the battery. If ingredients within the battery are leaking follow first aid section of this document.



9. Physical and chemical properties

Properties such as pH, boiling point flash points are not applicable as the batteries are solid articles.

State:	Solid
Odour:	Not applicable
pH:	Not applicable
Vapour pressure:	Not applicable
Vapour density:	Not applicable
Boiling point:	Not applicable
Solubility in water:	Insoluble
Specific gravity:	Not applicable
Density:	Not applicable

10. Stability and Reactivity

Stability:	Stable under normal conditions.
Reactivity:	Stable under normal conditions.
Conditions to avoid:	Avoid exposure to heat and open flames, and corrosives. Do not crush, puncture, incinerate, disassemble, or immerse in water.
Materials to avoid:	Avoid exposure to heat, open flame, and corrosives.
Hazardous decomposition products:	None under normal conditions. If cells are opened or damaged, hydrogen fluoride and carbon monoxide may be released.
Hazardous reactivity (polymerization):	Will not occur.

11. Toxicological information

Acute toxicity:	This product does not elicit toxicological properties during routine handling and use. Contents of broken/leaking battery may be irritating/corrosive to skin and eyes, and if ingested.
Serious eye damage/irritation:	Contents of open battery can be eye irritant or corrosive.
Skin corrosion/irritation:	Not expected under normal use. Contents of open battery can be a skin irritant or corrosive.
Respiratory or skin sensitisation:	Not a skin or respiratory sensitiser.
Inhalation:	None expected.



11. Toxicological information

Ingestion: Not expected under normal use. Ingestion of battery contents may cause gastrointestinal tract burns, nausea and vomiting.

Germ cell mutagenicity: No data available.

Carcinogenicity: IARC: Not listed according to IARC.

(IARC: International Agency for Research on Cancer, by the World Health Organisation (WHO)).

Reproductive toxicity: No data available.

Specific target organ toxicity – single exposure: May cause irritation/corrosion to eyes, skin, gastrointestinal tract on contact with open battery contents.

Specific target organ toxicity – repeated exposure: None under normal conditions of use. May be skin sensitiser on contact with open battery contents.

Aspiration hazard: No data available.

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 TCO documents and relevant international ECO requirements:

Polybromated Biphenyls (PBB)
Polybromated Diphenylethers (PBDE)
Polychlorinated Biphenyls (PCB)
Polychlorinated Terphenyls (PCT)
Polychlorinated Paphthalene (PCN)
Chlorinated Paraffins (CFC)
Polyvinyl Chloride (PVC)
Carbon Tetrachloride

12. Ecological information

Self-assessment: Slightly hazardous for water in the case of a broken/open battery with leakage of the contents. The batteries do not contain mercury, cadmium or other heavy metals. Do not allow large quantities to reach sewage system and waterways.

Ecotoxicity: No data available.

Persistence and biodegradability: No data available.

Bioaccumulative potential: No data available.

Mobility in soil: No data available.

Results of PBT and VPvB assessment: PBT/VPvB assessment not available as chemical safety assessment not required/not conducted.

Other adverse effects: No data available.



13. Disposal considerations

Do not dispose in fire. Disposal should be made with consideration to recycling options available in your area. Dispose at permitted waste treatment and/or disposal sites in accordance with local and national regulations.

Batteries do not contain hazardous materials according to EC Directives 91/157/EEC & 93/86/EEC.

14. Transport information

IATA (56th Ed., 2015):

Proper shipping name: Lithium ion batteries contained in equipment
UN 3481
Class 9
EQ Code- E0
Packaging Instruction – P967 (Section II)
Special Provisions – A48, A99, A154, A164, A181, A185.

IMDG (2014 Ed.)

Proper shipping name: Lithium ion batteries contained in equipment
UN 3481
Class 9
EQ Code- E0
Packaging Instruction – P903, P908, P909, LP903, LP904
Special Provisions – 188, 230, 348, 360, 376, 377.

There are no hazards in accordance with the UN recommendations tests (Manual of Tests and Criteria, Part III, sub-section 38.3, 1.2m Drop):

N	Items	Result	Remark
1	Altitude	Pass	
2	Thermal Shock	Pass	
3	Vibration	Pass	
4	Shock	Pass	
5	External Shock	Pass	
6	Impact	Pass	
7	Overcharge	Pass	
8	Forced Discharge	N/A	For cell
9	1.2m Drop Test	Pass	

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15. Regulatory information

Not classified as hazardous according to the Globally Harmonised System of Classification and Labelling of chemicals (GHS). The product is made from materials with no detectable mercury.

This battery is to be used in dental curing lights Radium Cal and Radium Plus regulated by:

- TGA
 - Medical Devices Directive 93/42/EEC
 - FDA
 - National regulations.
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16. Other information

The information provided herein is given in good faith, but no warranty expressed or implied is made.

Prepared by: SDI Limited
3-13 Brunsdon Street, Bayswater
Victoria, 3153, Australia

Phone Number:
+61 3 8727 7111

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Department issuing MSDS: Research and Development

Contact: R&D Director
