



Material Safety Data Sheet

1. Product & Company Identification:

| | |
|--------------------------|--|
| Product | Li-Polymer Battery |
| Manufacturer: | Conrad Electronic SE |
| Model: | 11,1 V LIPO-FLUGAKKU 2200 MAH / 40 C |
| Nominal capacity: | 2200mAh |
| Nominal voltage: | 11.1 V |
| Address: | Klaus-Conrad-Strasse 1, D-92242 Hirschau |
| Telephone: | + 49 9604408833 |
| Date of issue: | 05.04.2012 |

2. Composition /Information on Ingredients:

| MATERIAL OR INGREDIENT | CAS Index No./EC No. | Molecular formula | Percent |
|---------------------------------|----------------------|--------------------|---------|
| Cobalt lithium dioxide | 12190-79-3 | LiCoO ₂ | 20-35% |
| Aluminium | 7429-90-5 | Al | 10-15% |
| Lithium | 7439-93-2 | Li | 10-15% |
| Lithium hexafluorophosphate(1-) | 21324-40-3 | | 3-7% |
| Carbon black | 1333-86-4 | | 2-5% |
| Nickel | 7440-02-0 | Ni | 1-2% |
| Polyvinylidene fluoride | 24937-79-9 | | 3-6% |
| Graphite | 7782-42-5 | C | 10-16% |
| Copper | 7440-50-8 | Cu | 15-20% |

Remark: cobalt lithium dioxide (CAS No.: 12190-79-3) Synonym: lithium cobalt(III) oxide



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3. Hazardous Identification:

Hazard description:

Not applicable.

Information pertaining to particular dangers for man and environment:

A sealed polymer battery is not hazardous in normal use on principle.

The product has not to be labelled due to the calculation procedure of international guideline.

The materials contained in this product may only represent below hazard if the integrity of the battery is compromised; physically or electrically abused.

Harmful in contact with skin.

Causes burns.

Limited evidence of a carcinogenic effect.

May cause sensitisation by inhalation and skin contact.

Reacts violently with water, liberating extremely flammable gases.

Harmful: danger of serious damage to health by prolonged exposure through inhalation.

Classification system:

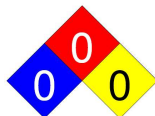
The classification was made according to the latest editions of international substances lists, and expanded upon from company and literature data.

NFPA ratings (scale 0 - 4)

Health = 0

Fire = 0

Reactivity = 0



HMIS-ratings (scale 0 - 4)

Health = 0

Fire = 0

Reactivity = 0



4. First Aid Measures:

General information: If exposure to internal materials within battery due to damaged outer casing, the following actions are recommended.

After inhalation: Supply fresh air and to be sure call for a doctor. In case of unconsciousness place patient stably in side



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position for transportation.

After skin contact: Immediately wash with water and soap and rinse thoroughly.

After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing: Drink copious amounts of water and provide fresh air. Immediately call a doctor.

5. Fire Fighting Measures:

Suitable extinguishing agents: CO₂, sand, extinguishing powder. Do not use water.

For safety reasons unsuitable extinguishing agents: Water

Protective equipment: Wear fully protective suit.

6. Accidental Release Measures:

Person-related safety precautions: Wear protective equipment. Keep unprotected persons away.

Measures for environmental protection: Do not allow product to reach sewage system or any water course. Inform respective authorities in case of seepage into water course or sewage system. Do not allow to enter sewers/ surface or ground water.

Measures for cleaning/collecting: Use neutralizing agent. Dispose contaminated material as waste according to item 13. Ensure adequate ventilation. Do not flush with water or aqueous cleansing agents

Additional information: See Section 7 for information on safe handling.

7. Handling & Store:

a) Handling:

Information for safe handling: No special measures required.

Information about protection against explosions and fires:

- Protect from heat.
- Protect against electrostatic charges.
- Prevent impact and friction.

b) Storage:

Requirements to be met by storerooms and receptacles: Store in a cool location.

Information about storage in one common storage facility: Store away from flammable substances.

Further information about storage conditions: Store in cool, dry conditions in well sealed receptacles



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8. Exposure Control/Personal Protection:

Additional information about design of technical systems: No further data; see item 7.

| Components with limit values that require monitoring at the workplace: | |
|--|---|
| 7429-90-5 aluminium | |
| PEL (USA) | 15* 5** mg/m ³ Metal dust *total dust **respirable fraction |
| REL (USA) | 10* 5** mg/m ³ Metal dust *total dust **respirable fraction |
| TLV (USA) | 1* mg/m ³ *as respirable fraction |
| WEL (Great Britain) | 10* 4** mg/m ³ *inhalable dust **respirable dust |
| 7782-42-5 Graphite | |
| PEL (USA) | 15 mppcf mg/m ³ |
| REL (USA) | 2.5* mg/m ³ *respirable dust |
| TLV (USA) | 2* mg/m ³ all forms except graphite fibers;*resp. fraction |
| 7440-50-8 copper | |
| PEL (USA) | 1* 0.1** mg/m ³ as Cu *dusts and mists **fume |
| REL (USA) | 1* 0.1 R** mg/m ³ as Cu *dusts and mists **fume |
| TLV (USA) | Short-term value: 0.1** mg/m ³ Long-term value: 1* 0.2** mg/m ³ *dusts and mists; **fume; as Cu |
| WEL (Great Britain) | Short-term value: 2** mg/m ³ Long-term value: 0.2* 1** mg/m ³ *fume **dusts and mists (as Cu) |
| 1333-86-4 Carbon black | |

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| | |
|-------------------------|--|
| PEL (USA) | 3.5 mg/m ³ |
| REL (USA) | 3.5* mg/m ³ |
| TLV (USA) | *0.1 in presence of PAHs, as PAHs; 10-hr TWA |
| WEL (Great Britain) | 3.5 mg/m ³ |
| | Short-term value: 7 mg/m ³ |
| | Long-term value: 3.5 mg/m ³ |
| 7440-02-0 nickel | |
| PEL (USA) | 1 mg/m ³ |
| REL (USA) | 0.015 mg/m ³ |
| TLV (USA) | Elemental |
| | 1.5* mg/m ³ |
| WEL (Great Britain) | Elemental;*as inhalable fraction |
| | 0.5 mg/m ³ |
| | as Ni |

Additional information:

The lists that were valid during the creation were used as basis.

Personal protective equipment:

General protective and hygienic measures:

Keep away from foodstuffs, beverages and feed.

Immediately remove all soiled and contaminated clothing.

Wash hands before breaks and at the end of work.

Avoid contact with skin and eyes.

Breathing equipment:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

Protection of hands:

Protective gloves



The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

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Material of gloves:

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

Penetration time of glove material

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

Eye protection:

Tightly sealed goggles



9. Physical/Chemical Properties:

| |
|--|
| General Information |
| Form: Squar Color: Silver Odor: Without |
| Change in condition Melting point/Melting range: Not available Boiling point/Boiling range: Not available |
| Flash point: Not available |
| Flammability (solid, gaseous): Not available |
| Ignition temperature: Not available |
| Auto igniting: Not available |
| Danger of explosion: Not available |



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|---|
| Explosion limits: Lower: Not available Upper: Not available Oxidizing properties: Not available |
| Vapor pressure: Not available |
| Density: Not available Relative density: Not available Vapour density: Not available Evaporation rate: Not available |
| Solubility in / Miscibility with Water: Not available |
| pH-value: Not available |
| Viscosity: Dynamic: Not available |

10. Stability & Reactivity:

Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.

Materials to be avoided:

Dangerous reactions: Not available

Dangerous products of decomposition: No dangerous decomposition products known.

11. Toxicological information:

Acute toxicity:

LD/LC50 values that are relevant for classification: 1333-86-4 Carbon black, Oral, LD50, 10000 mg/kg (rat)

Primary irritant effect:

On the skin: Irritating effect possible.

On the eye: Irritating effect possible.

Sensitization: Sensitization possible.



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12. Ecological information:

Additional ecological information:

General notes:

No ecological impacts expected under normal use conditions.

The materials contained in this product may only represent below ecological impact if the integrity of the battery is compromised; physically or electrically abused.

Water hazard class 2 (Self-assessment): hazardous for water.

Do not allow product to reach ground water, water course or sewage system.

Must not reach bodies of water or drainage ditch undiluted or unneutralized.

Danger to drinking water if even extremely small quantities leak into the ground.

13. Disposal considerations:

Product:

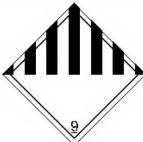
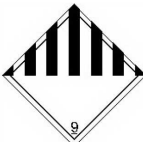
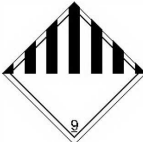
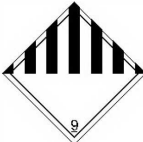
Recommendation: Hand over to hazardous waste disposers.

Uncleaned packagings:

Recommendation: Disposal must be made according to official regulations.

14. Transport Information:

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|---|---|
| DOT regulations: | |
|  | |
| Hazard class: | 9 |
| Identification number: | UN3480 |
| Packing group: | II |
| Proper shipping name (technical name): | LITHIUM ION BATTERIES |
| Label: | 9 |
| Land transport ADR/RID (cross-border): | |
|  | |
| ADR/RID class: | 9 Miscellaneous dangerous substances and articles |
| Danger code (Kemler): | - |
| UN-Number: | 3480 |
| Packaging group: | II |
| Label: | 9 |
| Description of goods: | 3480 LITHIUM ION BATTERIES |
| Maritime transport IMDG: | |
|  | |
| IMDG Class: | 9 |
| UN Number: | 3480 |
| Label: | 9 |
| Packaging group: | II |
| EMS Number: | F-G,S-N |
| Marine pollutant: | No |
| Propper shipping name: | LITHIUM ION BATTERIES |
| Air transport ICAO-TI and IATA-DGR: | |
|  | |
| ICAO/IATA Class: | 9 |
| UN/ID Number: | 3480 |
| Label: | 9 |
| Packaging group: | II |
| Propper shipping name: | LITHIUM ION BATTERIES |
| Transport/Additional information: Special provisions: 188, 230, 310, 636 | |



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15. Regulatory Information:

Sara

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|--|-----------|
| Section 355 (extremely hazardous substances) | |
| None of the ingredients is listed. | |
| Section 313 (Specific toxic chemical listings): | |
| 7429-90-5 | aluminium |
| 7440-50-8 | copper |
| 7440-02-0 | nickel |
| TSCA (Toxic Substances Control Act): | |
| All ingredients are listed. | |

Proposition 65

| | |
|--|--------------|
| Chemicals known to cause cancer: | |
| 1333-86-4 | Carbon black |
| 7440-02-0 | nickel |
| Chemicals known to cause reproductive toxicity for females: | |
| None of the ingredients is listed. | |
| Chemicals known to cause reproductive toxicity for males: | |
| None of the ingredients is listed. | |
| Chemicals known to cause developmental toxicity: | |
| None of the ingredients is listed. | |

Carcinogenicity categories

| | | |
|---|--------------|----|
| EPA (Environmental Protection Agency) | | |
| 7440-50-8 | Copper | D |
| IARC (International Agency for Research on Cancer) | | |
| 1333-86-4 | Carbon black | 2B |
| 7440-02-0 | Nickel | 2B |
| NTP (National Toxicology Program) | | |
| 7440-02-0 | nickel | R |
| TLV (Threshold Limit Value established by ACGIH) | | |
| 7429-90-5 | Aluminium | A4 |
| 1333-86-4 | Carbon black | A4 |
| 7440-02-0 | Nickel | A5 |
| NIOSH-Ca (National Institute for Occupational Safety and Health) | | |
| 1333-86-4 | Carbon black | |
| 7440-02-0 | Nickel | |
| OSHA-Ca (Occupational Safety & Health Administration) | | |
| None of the ingredients is listed. | | |



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Product related hazard informations:

Risk phrases:

The materials contained in this product may only represent below hazard if the integrity of the battery is compromised; physically or electrically abused.

Harmful in contact with skin.

Causes burns.

Limited evidence of a carcinogenic effect.

May cause sensitisation by inhalation and skin contact.

Reacts violently with water, liberating extremely flammable gases.

Harmful: danger of serious damage to health by prolonged exposure through inhalation.

16. Other Information:

DISCLAIMER OF LIABILITY

The information in this MSDS/SDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in anyway connected with the handling, storage, use or disposal of the product. This MSDS/SDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS/SDS information may not be applicable.