

1. IDENTIFICATION

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|----------------------------|--|
| Product Name | Vitamin B1 Hydrochloride |
| Other Names | Thiamine hydrochloride |
| Uses | Active pharmaceutical ingredient, nutritional ingredient, feed additive. |
| Chemical Family | No Data Available |
| Chemical Formula | C ₁₂ H ₁₇ ClN ₄ OS.HCl |
| Chemical Name | Vitamin B1 Hydrochloride |
| Product Description | No Data Available |

Contact Details of the Supplier of this Safety Data Sheet

| Organisation | Location | Telephone |
|-------------------------|--|-----------------|
| Redox Pty Ltd | 2 Swettenham Road Minto NSW 2566 Australia | +61-2-97333000 |
| Redox Pty Ltd | 11 Mayo Road Wiri Auckland 2104 New Zealand | +64-9-2506222 |
| Redox Inc. | 3960 Paramount Boulevard Suite 107 Lakewood CA 90712 USA | +1-424-675-3200 |
| Redox Chemicals Sdn Bhd | Level 2, No. 8, Jalan Sapir 33/7 Seksyen 33, Shah Alam Premier Industrial Park 40400 Shah Alam Sengalor, Malaysia | +60-3-5614-2111 |

Emergency Contact Details

For emergencies only; DO NOT contact these companies for general product advice.

| Organisation | Location | Telephone |
|----------------------------|--------------|--|
| Poisons Information Centre | Westmead NSW | 1800-251525 131126 |
| Chemcall | Australia | 1800-127406 +64-4-9179888 |
| Chemcall | Malaysia | +64-4-9179888 |
| Chemcall | New Zealand | 0800-243622 +64-4-9179888 |
| National Poisons Centre | New Zealand | 0800-764766 |
| CHEMTREC | USA & Canada | 1-800-424-9300 CN723420 +1-703-527-3887 |

2. HAZARD IDENTIFICATION

Poisons Schedule (Aust) Not Scheduled

Globally Harmonised System

Hazard Classification NOT hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)

Signal Word None

National Transport Commission (Australia)

Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification NOT Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Environmental Protection Authority (New Zealand)

Hazardous Substances and New Organisms Amendment Act 2015

HSNO Classifications Health Hazards **6.1E** Substances that are acutely toxic –May be harmful, Aspiration hazard

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

| Chemical Entity | Formula | CAS Number | Proportion |
|------------------------|---|------------|------------|
| Thiamine hydrochloride | C ₁₂ H ₁₇ ClN ₄ OS.HCl | 67-03-8 | >98 % |

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

| | |
|--|---|
| Swallowed | If swallowed: Rinse mouth. Call a Poison Centre or doctor/physician if you feel unwell. If a large amount is ingested: Immediately call a Poison Centre or doctor/physician. |
| Eye | Eye contact: Immediately flush eyes with running water for several minutes. If eye irritation persists, get medical advice/attention. |
| Skin | Skin contact: Immediately rinse skin with running water/shower. If skin irritation occurs, get medical advice/attention. |
| Inhaled | If inhaled: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a Poison Centre or doctor/physician if experiencing respiratory symptoms. |
| Advice to Doctor | Treat symptomatically. |
| Medical Conditions Aggravated by Exposure | No information available. |

5. FIRE FIGHTING MEASURES

| | |
|---|---|
| General Measures | If safe to do so, move undamaged containers from fire area. |
| Flammability Conditions | No information available. |
| Extinguishing Media | Water, Foam, Dry chemical or CO ₂ . Use fire-extinguishing media appropriate for surrounding materials. |
| Fire and Explosion Hazard | Fine dust dispersed in air may ignite. |
| Hazardous Products of Combustion | Thermal decomposition can lead to release of irritating gases and vapours; Hydrogen chloride gas, Nitrogen oxides (NO _x), Carbon monoxide (CO), Carbon dioxide (CO ₂), Sulfur oxides. |
| Special Fire Fighting Instructions | No information available. |

| | |
|--------------------------------------|--|
| Personal Protective Equipment | As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. |
| Flash Point | No Data Available |
| Lower Explosion Limit | No Data Available |
| Upper Explosion Limit | No Data Available |
| Auto Ignition Temperature | No Data Available |
| Hazchem Code | No Data Available |

6. ACCIDENTAL RELEASE MEASURES

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|---|--|
| General Response Procedure | Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Avoid inhalation of dust from the spilled material. |
| Clean Up Procedures | Sweep up or vacuum up spillage and collect in suitable container for disposal. |
| Containment | Stop leak if safe to do so. Avoid the generation of dusts during clean-up. |
| Decontamination | Clean surface thoroughly to remove residual contamination. |
| Environmental Precautionary Measures | For waste disposal, see section 13. |
| Evacuation Criteria | Spill or leak area should be isolated immediately. Keep unnecessary personnel away. |
| Personal Precautionary Measures | Wear appropriate personal protective equipment (see Section 8).. |

7. HANDLING AND STORAGE

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|------------------|--|
| Handling | Ensure an eye bath and safety shower are available and ready for use. Handle in accordance with good industrial hygiene and safety practice. Ensure adequate ventilation. Avoid dust formation. Wear personal protective equipment. Avoid contact with skin and eyes. Do not breathe dust. |
| Storage | Keep in a cool, dry and well-ventilated place. Keep container tightly closed. Protect from light. Keep away from alkalis, oxidising agents and reducing agents. |
| Container | Keep in original container. |

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

| | |
|--------------------------------------|---|
| General | This product does not contain any materials with occupational exposure limits. Safe Work Australia Exposure Standard for Rogue dust (inspirable dust): Time Weighted Average (TWA): 10 mg/m ³ |
| Exposure Limits | No Data Available |
| Biological Limits | No information available. |
| Engineering Measures | Use process enclosures, local exhaust ventilation, or other engineering controls to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. |
| Personal Protection Equipment | Respiratory protection: Where respirators are deemed necessary to reduce or control occupational exposures, use approved respiratory protection, and have an effective respirator program in place (AS 1715/1716). Eye/face protection: Wear appropriate protective eyeglasses or chemical safety goggles (AS 1336/1337). Hand protection: Wear appropriate protective gloves (AS 2161). Skin/body protection: Wear appropriate clothing and footwear to prevent skin exposure (AS 3765/2210). |
| Special Hazards Precautions | No information available. |
| Work Hygienic Practices | Do NOT eat, drink or smoke when using this product. Wash thoroughly after handling. |

9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| Physical State | Solid |
| Appearance | Powder |
| Odour | Characteristic, nutty |
| Colour | White |
| pH | 2.7 - 3.4 (1% aqueous sol.) |
| Vapour Pressure | <0.0000001 kPa (@ 25 °C) |
| Relative Vapour Density | 11.7 |
| Boiling Point | No Data Available |
| Melting Point | Decomposes |
| Freezing Point | No Data Available |
| Solubility | Freely soluble |
| Specific Gravity | No Data Available |
| Flash Point | No Data Available |
| Auto Ignition Temp | No Data Available |
| Evaporation Rate | No Data Available |
| Bulk Density | No Data Available |
| Corrosion Rate | No Data Available |
| Decomposition Temperature | 248 °C |
| Density | No Data Available |
| Specific Heat | No Data Available |
| Molecular Weight | 337.3 g/mol |
| Net Propellant Weight | No Data Available |
| Octanol Water Coefficient | No Data Available |
| Particle Size | No Data Available |
| Partition Coefficient | No Data Available |
| Saturated Vapour Concentration | No Data Available |
| Vapour Temperature | No Data Available |
| Viscosity | No Data Available |
| Volatile Percent | No Data Available |
| VOC Volume | No Data Available |
| Additional Characteristics | Solubility (other): Soluble in glycerol. Slightly soluble in alcohol. Insoluble in ether and benzene. |
| Potential for Dust Explosion | Fine dust dispersed in air may ignite. |
| Fast or Intensely Burning Characteristics | No information available. |
| Flame Propagation or Burning Rate of Solid Materials | No information available. |
| Non-Flammables That Could Contribute Unusual Hazards to a Fire | No information available. |
| Properties That May Initiate or Contribute to Fire Intensity | No information available. |
| Reactions That Release Gases or Vapours | Thermal decomposition can lead to release of irritating gases and vapours; Hydrogen chloride gas, Nitrogen oxides (NO _x), Carbon monoxide (CO), Carbon dioxide (CO ₂), Sulfur oxides. |
| Release of Invisible Flammable Vapours and Gases | No information available. |

10. STABILITY AND REACTIVITY

Stable under normal conditions.

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| Chemical Stability | |
| Conditions to Avoid | Avoid dust formation. |
| Materials to Avoid | Keep away from Alkalis, Oxidizing agents, Reducing agents. |
| Hazardous Decomposition Products | Thermal decomposition can lead to release of irritating gases and vapours; Hydrogen chloride gas, Nitrogen oxides (NOx), Carbon monoxide (CO), Carbon dioxide (CO ₂), Sulfur oxides. |
| Hazardous Polymerisation | Does not occur. |

11. TOXICOLOGICAL INFORMATION

| | |
|----------------------------|---|
| General Information | <p>Irritation: No information available. Sensitization: No information available. Mutagenic Effects: Negative (S. typhimurium Ames assay). Reproductive Effects: Due to lack of data the classification is not possible. Developmental Effects: No information available. Teratogenicity: No information available. STOT - single exposure: Due to lack of data the classification is not possible. STOT - repeated exposure: Due to lack of data the classification is not possible. Aspiration hazard: Based on available data, the classification criteria are not met. Other Adverse Effects: The toxicological properties have not been fully investigated.</p> |
| Acute | |
| Ingestion | <p>ACUTE TOXICITY: - Oral (Mouse) LD50: 8,824 mg/kg - Oral (Rat) LD50: 3,710 mg/kg</p> |
| Carcinogen Category | None |

12. ECOLOGICAL INFORMATION

| | |
|----------------------------------|--|
| Ecotoxicity | <p>Freshwater fish LC50: >100 mg/L (96 h) Water flea EC50: >100 mg/L (48 h)</p> |
| Persistence/Degradability | No information available. |
| Mobility | No information available. |
| Environmental Fate | No information available. |
| Bioaccumulation Potential | No information available. |
| Environmental Impact | No Data Available |

13. DISPOSAL CONSIDERATIONS

| | |
|--|--|
| General Information | Dispose of waste product/container in accordance with all applicable local, regional and national regulations. |
| Special Precautions for Land Fill | No information available. |

14. TRANSPORT INFORMATION

Land Transport (Australia)

ADG Code

Proper Shipping Name Vitamin B1 Hydrochloride

| | |
|---------------------------|-------------------|
| Class | No Data Available |
| Subsidiary Risk(s) | No Data Available |
| | No Data Available |
| UN Number | No Data Available |
| Hazchem | No Data Available |
| Pack Group | No Data Available |
| Special Provision | No Data Available |

Land Transport (Malaysia)

ADR

| | |
|-----------------------------|--------------------------|
| Proper Shipping Name | Vitamin B1 Hydrochloride |
| Class | No Data Available |
| Subsidiary Risk(s) | No Data Available |
| | No Data Available |
| UN Number | No Data Available |
| Hazchem | No Data Available |
| Pack Group | No Data Available |
| Special Provision | No Data Available |

Land Transport (New Zealand)

NZS5433

| | |
|-----------------------------|--------------------------|
| Proper Shipping Name | Vitamin B1 Hydrochloride |
| Class | No Data Available |
| Subsidiary Risk(s) | No Data Available |
| | No Data Available |
| UN Number | No Data Available |
| Hazchem | No Data Available |
| Pack Group | No Data Available |
| Special Provision | No Data Available |

Land Transport (United States of America)

US DOT

| | |
|-----------------------------|--------------------------|
| Proper Shipping Name | Vitamin B1 Hydrochloride |
| Class | No Data Available |
| Subsidiary Risk(s) | No Data Available |
| | No Data Available |
| UN Number | No Data Available |
| Hazchem | No Data Available |
| Pack Group | No Data Available |
| Special Provision | No Data Available |

Sea Transport

IMDG Code

| | |
|-----------------------------|--------------------------|
| Proper Shipping Name | Vitamin B1 Hydrochloride |
| Class | No Data Available |
| Subsidiary Risk(s) | No Data Available |
| UN Number | No Data Available |
| Hazchem | No Data Available |
| Pack Group | No Data Available |
| Special Provision | No Data Available |

| | |
|-------------------------|-------------------|
| EMS | No Data Available |
| Marine Pollutant | No |

Air Transport

IATA DGR

| | |
|-----------------------------|--------------------------|
| Proper Shipping Name | Vitamin B1 Hydrochloride |
| Class | No Data Available |
| Subsidiary Risk(s) | No Data Available |
| UN Number | No Data Available |
| Hazchem | No Data Available |
| Pack Group | No Data Available |
| Special Provision | No Data Available |

National Transport Commission (Australia)

Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

| | |
|---------------------------------------|---|
| Dangerous Goods Classification | NOT Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code) |
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15. REGULATORY INFORMATION

| | |
|--------------------------------|-------------------|
| General Information | No Data Available |
| Poisons Schedule (Aust) | Not Scheduled |

Environmental Protection Authority (New Zealand)

Hazardous Substances and New Organisms Amendment Act 2015

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|----------------------|-----------|
| Approval Code | HSR003666 |
|----------------------|-----------|

National/Regional Inventories

| | |
|--------------------------------|----------------|
| Australia (AICS) | Listed |
| Canada (DSL) | Listed |
| Canada (NDSL) | Not Listed |
| China (IECSC) | Listed |
| Europe (EINECS) | 200-641-8 |
| Europe (REACH) | Pre-registered |
| Japan (ENCS/METI) | Listed |
| Korea (KECI) | KE-01482 |
| Malaysia (EHS Register) | Not Listed |
| New Zealand (NZIoC) | Listed |
| Philippines (PICCS) | Listed |

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|--|----------------|
| Switzerland (Giftliste 1) | Not Determined |
| Switzerland (Inventory of Notified Substances) | Not Determined |
| Taiwan (NCSR) | Listed |
| USA (TSCA) | Listed |

16. OTHER INFORMATION

| | |
|------------------------------|---|
| Related Product Codes | VITBAT1000, VITBAT1001, VITBAT1002, VITBAT1003, VITBAT1004, VITBAT1005, VITBAT1006, VITBAT1007, VITBAT1008, VITBAT1009, VITBAT1010, VITBAT1011, VITBAT1012, VITBAT1013, VITBAT1014, VITBAT1015, VITBAT1016, VITBAT1017, VITBAT1018, VITBAT1019, VITBAT1020, VITBAT1021, VITBAT1022, VITBAT1023, VITBAT1024, VITBAT1025, VITBAT2000, VITBAT2020, VITBAT2100, VITBAT2200, VITBAT2500, VITBAT3000, VITBAT3030, VITBAT4000, VITBAT4001, VITBAT4100, VITBAT4200, VITBAT4201, VITBAT4202, VITBAT4300, VITBAT4301, VITBAT4302, VITBAT4303, VITBAT4400, VITBAT4401, VITBAT4402, VITBAT4500 |
| Revision | 3 |
| Revision Date | 01 Mar 2017 |
| Key/Legend | <p>< Less Than > Greater Than AICS Australian Inventory of Chemical Substances atm Atmosphere CAS Chemical Abstracts Service (Registry Number) cm² Square Centimetres CO₂ Carbon Dioxide COD Chemical Oxygen Demand deg C (°C) Degrees Celcius EPA (New Zealand) Environmental Protection Authority of New Zealand deg F (°F) Degrees Farenheit g Grams g/cm³ Grams per Cubic Centimetre g/l Grams per Litre HSNO Hazardous Substance and New Organism IDLH Immediately Dangerous to Life and Health immiscible Liquids are insoluble in each other. inHg Inch of Mercury inH₂O Inch of Water K Kelvin kg Kilogram kg/m³ Kilograms per Cubic Metre lb Pound LC50 LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours. LD50 LD stands for Lethal Dose. LD50 is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals. ltr or L Litre m³ Cubic Metre mbar Millibar mg Milligram mg/24H Milligrams per 24 Hours mg/kg Milligrams per Kilogram mg/m³ Milligrams per Cubic Metre Misc or Miscible Liquids form one homogeneous liquid phase regardless of the amount of either component present. mm Millimetre mmH₂O Millimetres of Water mPa.s Millipascals per Second N/A Not Applicable NIOSH National Institute for Occupational Safety and Health NOHSC National Occupational Health and Safety Commission OECD Organisation for Economic Co-operation and Development Oz Ounce PEL Permissible Exposure Limit Pa Pascal ppb Parts per Billion ppm Parts per Million ppm/2h Parts per Million per 2 Hours</p> |

ppm/6h Parts per Million per 6 Hours
psi Pounds per Square Inch
R Rankine
RCP Reciprocal Calculation Procedure
STEL Short Term Exposure Limit
TLV Threshold Limit Value
tne Tonne
TWA Time Weighted Average
ug/24H Micrograms per 24 Hours
UN United Nations
wt Weight