



# COBALT CHLORIDE ANHYDROUS

## ALPHA CHEMICALS PTY LTD

Chemwatch Hazard Alert Code: 3

Chemwatch: 13675  
Version No: 7.1.1.1  
Safety Data Sheet according to WHS and ADG requirements

Issue Date: 21/12/2017  
Print Date: 17/09/2020  
S.GHS.AUS.EN

### SECTION 1 Identification of the substance / mixture and of the company / undertaking

#### Product Identifier

|                               |   |
|-------------------------------|---|
| Product name                  | COBALT CHLORIDE ANHYDROUS   |
| Chemical Name                 | cobalt(II) chloride   |
| Synonyms                      | Co-Cl <sub>2</sub> ; Cl <sub>2</sub> -Co; cobalt chloride; cobaltous chloride; cobalt dichloride; cobalt (II) chloride; CAS RN: 7791-13-1 cobalt(II) chloride hexahydrate; cobalt(2+) chloride; cobalt chloride anhydrous |
| Proper shipping name          | TOXIC SOLID, INORGANIC, N.O.S. (contains Cobalt Chloride Anhydrous)   |
| Chemical formula              | Cl <sub>2</sub> CoCl <sub>2</sub> Co.6H <sub>2</sub> O  |
| Other means of identification | Not Available   |
| CAS number                    | 7646-79-9   |

#### Relevant identified uses of the substance or mixture and uses advised against

|                          |  |
|--------------------------|--|
| Relevant identified uses | Used as absorbent for ammonia in gas masks, electroplating, hygrometers, manufacture of vitamin B12, flux for magnesium refining, solid lubricant, dye mordant, catalyst, fertiliser additive. Moisture indicator in silica gel, laboratory reagent. |
|--------------------------|--|

#### Details of the supplier of the safety data sheet

|                         |   |
|-------------------------|---|
| Registered company name | ALPHA CHEMICALS PTY LTD                         |
| Address                 | 4 ALLEN PLACE WETHERILL PARK NSW 2099 Australia |
| Telephone               | 61 (0)2 9982 4622                               |
| Fax                     | Not Available                                   |
| Website                 | ~   |
| Email                   | shane@alphachem.com.au                          |

#### Emergency telephone number

|                                   |                         |
|-----------------------------------|-------------------------|
| Association / Organisation        | ALPHA CHEMICALS PTY LTD |
| Emergency telephone numbers       | 61 (0)418 237 771       |
| Other emergency telephone numbers | Not Available           |

### SECTION 2 Hazards identification

#### Classification of the substance or mixture

**HAZARDOUS CHEMICAL. DANGEROUS GOODS. According to the WHS Regulations and the ADG Code.**

#### ChemWatch Hazard Ratings

|              | Min | Max |              |
|--------------|-----|-----|--------------|
| Flammability | 0   |     |              |
| Toxicity     | 3   |     | 0 = Minimum  |
| Body Contact | 0   |     | 1 = Low      |
| Reactivity   | 0   |     | 2 = Moderate |
| Chronic      | 3   |     | 3 = High     |
|              |     |     | 4 = Extreme  |

|                    |   |
|--------------------|---|
| Poisons Schedule   | Not Applicable  |
| Classification [1] | Respiratory Sensitizer Category 1, Skin Sensitizer Category 1, Germ cell mutagenicity Category 2, Chronic Aquatic Hazard Category 1, Reproductive Toxicity Category 1B, Acute Aquatic Hazard Category 1, Acute Toxicity (Oral) Category 4 |
| Legend:            | 1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI   |

#### Label elements

**COBALT CHLORIDE ANHYDROUS**

|                            |   |
|----------------------------|---|
| <b>Hazard pictogram(s)</b> |  |
|----------------------------|---|

|                    |               |
|--------------------|---------------|
| <b>Signal word</b> | <b>Danger</b> |
|--------------------|---------------|

**Hazard statement(s)**

|             |  |
|-------------|--|
| <b>H334</b> | May cause allergy or asthma symptoms or breathing difficulties if inhaled. |
| <b>H317</b> | May cause an allergic skin reaction.                                       |
| <b>H341</b> | Suspected of causing genetic defects.                                      |
| <b>H410</b> | Very toxic to aquatic life with long lasting effects.                      |
| <b>H360</b> | May damage fertility or the unborn child.                                  |
| <b>H302</b> | Harmful if swallowed.  |

**Precautionary statement(s) Prevention**

|             |  |
|-------------|--|
| <b>P201</b> | Obtain special instructions before use.                                    |
| <b>P261</b> | Avoid breathing dust/fumes.  |
| <b>P280</b> | Wear protective gloves/protective clothing/eye protection/face protection. |
| <b>P281</b> | Use personal protective equipment as required.                             |
| <b>P285</b> | In case of inadequate ventilation wear respiratory protection.             |
| <b>P270</b> | Do not eat, drink or smoke when using this product.                        |
| <b>P273</b> | Avoid release to the environment.  |
| <b>P272</b> | Contaminated work clothing should not be allowed out of the workplace.     |

**Precautionary statement(s) Response**

|                  |  |
|------------------|--|
| <b>P304+P340</b> | IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. |
| <b>P308+P313</b> | IF exposed or concerned: Get medical advice/attention.   |
| <b>P321</b>      | Specific treatment (see advice on this label).   |
| <b>P342+P311</b> | If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.                  |
| <b>P363</b>      | Wash contaminated clothing before reuse.   |
| <b>P302+P352</b> | IF ON SKIN: Wash with plenty of water.   |
| <b>P333+P313</b> | If skin irritation or rash occurs: Get medical advice/attention.                                 |
| <b>P391</b>      | Collect spillage.  |

**Precautionary statement(s) Storage**

|             |                  |
|-------------|------------------|
| <b>P405</b> | Store locked up. |
|-------------|------------------|

**Precautionary statement(s) Disposal**

|             |  |
|-------------|--|
| <b>P501</b> | Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation. |
|-------------|--|

**SECTION 3 Composition / information on ingredients**

**Substances**

| CAS No    | %[weight] | Name                             |
|-----------|-----------|----------------------------------|
| 7646-79-9 | 100       | <u>Cobalt Chloride Anhydrous</u> |

**Mixtures**

See section above for composition of Substances

**SECTION 4 First aid measures**

**Description of first aid measures**

|                     |  |
|---------------------|--|
| <b>Eye Contact</b>  | <p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"> <li>▶ Immediately hold eyelids apart and flush the eye continuously with running water.</li> <li>▶ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.</li> <li>▶ Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.</li> <li>▶ Transport to hospital or doctor without delay.</li> <li>▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</li> </ul> |
| <b>Skin Contact</b> | <p>If skin contact occurs:</p> <ul style="list-style-type: none"> <li>▶ Immediately remove all contaminated clothing, including footwear.</li> <li>▶ Flush skin and hair with running water (and soap if available).</li> <li>▶ Seek medical attention in event of irritation.</li> </ul>  |

## COBALT CHLORIDE ANHYDROUS

|                   |   |
|-------------------|---|
| <b>Inhalation</b> | <ul style="list-style-type: none"> <li>▶ If fumes or combustion products are inhaled remove from contaminated area.</li> <li>▶ Lay patient down. Keep warm and rested.</li> <li>▶ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.</li> <li>▶ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.</li> <li>▶ Transport to hospital, or doctor, without delay.</li> </ul>  |
| <b>Ingestion</b>  | <ul style="list-style-type: none"> <li>▶ <b>IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.</b></li> <li>▶ For advice, contact a Poisons Information Centre or a doctor.</li> <li>▶ Urgent hospital treatment is likely to be needed.</li> <li>▶ In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.</li> <li>▶ If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the SDS should be provided. Further action will be the responsibility of the medical specialist.</li> <li>▶ If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the SDS.</li> </ul> <p><b>Where medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:</b></p> <ul style="list-style-type: none"> <li>▶ <b>INDUCE</b> vomiting with fingers down the back of the throat, <b>ONLY IF CONSCIOUS</b>. Lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.</li> </ul> <p><b>NOTE:</b> Wear a protective glove when inducing vomiting by mechanical means.</p> |

### Indication of any immediate medical attention and special treatment needed

- ▶ Chronic exposures to cobalt and its compounds results in the so-called "hard metal pneumoconiosis" amongst industrial workers. The lesions consist of nodular conglomerate shadows in the lungs, together with peribronchial infiltration. The disease may be reversible. The acute form of the disease resembles a hypersensitivity reaction with malaise, cough and wheezing; the chronic form progresses to cor pulmonale.
- ▶ Chronic therapeutic administration may cause goiter and reduced thyroid activity.
- ▶ An allergic dermatitis, usually confined to elbow flexures, the ankles and sides of the neck, has been described.
- ▶ Cobalt cardiomyopathy may be diagnosed early by changes in the final part of the ventricular ECG (repolarisation). In the presence of such disturbances, the changes in carbohydrate metabolism (revealed by the glucose test) are of important diagnostic value.
- ▶ Treatment generally consists of a combination of Retabolil (1 injection per week over 4 weeks) and beta-blockers (average dose 60-80 mg Obsidan/24 hr). Potassium salts and diuretics have also proved useful.

#### BIOLOGICAL EXPOSURE INDEX (BEI)

| Determinant     | Sampling time                   | Index   | Comments |
|-----------------|---------------------------------|---------|----------|
| Cobalt in urine | End of shift at end of workweek | 15 ug/L | B        |
| Cobalt in blood | End of shift at end of workweek | 1 ug/L  | B, SQ    |

B: Background levels occur in specimens collected from subjects NOT exposed

SQ: Semi-quantitative determinant - Interpretation may be ambiguous; should be used as a screening test or confirmatory test.

## SECTION 5 Firefighting measures

### Extinguishing media

- ▶ Water spray or fog.
- ▶ Foam.
- ▶ Dry chemical powder.
- ▶ BCF (where regulations permit).
- ▶ Carbon dioxide.

### Special hazards arising from the substrate or mixture

|                             |             |
|-----------------------------|-------------|
| <b>Fire Incompatibility</b> | None known. |
|-----------------------------|-------------|

### Advice for firefighters

|                              |   |
|------------------------------|---|
| <b>Fire Fighting</b>         | <ul style="list-style-type: none"> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> <li>▶ Wear full body protective clothing with breathing apparatus.</li> <li>▶ Prevent, by any means available, spillage from entering drains or water course.</li> <li>▶ Use fire fighting procedures suitable for surrounding area.</li> <li>▶ <b>Do not approach containers suspected to be hot.</b></li> <li>▶ Cool fire exposed containers with water spray from a protected location.</li> <li>▶ If safe to do so, remove containers from path of fire.</li> <li>▶ Equipment should be thoroughly decontaminated after use.</li> </ul> |
| <b>Fire/Explosion Hazard</b> | <ul style="list-style-type: none"> <li>▶ Non combustible.</li> <li>▶ Not considered a significant fire risk, however containers may burn.</li> </ul> <p>Decomposition may produce toxic fumes of:<br/>hydrogen chloride<br/>metal oxides<br/>May emit poisonous fumes.</p>  |
| <b>HAZCHEM</b>               | 2X  |

## SECTION 6 Accidental release measures

### Personal precautions, protective equipment and emergency procedures

See section 8

### Environmental precautions

See section 12

### Methods and material for containment and cleaning up

Continued...

## COBALT CHLORIDE ANHYDROUS

|                     |   |
|---------------------|---|
| <b>Minor Spills</b> | <ul style="list-style-type: none"> <li>▶ Clean up all spills immediately.</li> <li>▶ Avoid contact with skin and eyes.</li> <li>▶ Wear protective clothing, gloves, safety glasses and dust respirator.</li> <li>▶ Use dry clean up procedures and avoid generating dust.</li> <li>▶ Sweep up or</li> <li>▶ Vacuum up (consider explosion-proof machines designed to be grounded during storage and use).</li> <li>▶ Place in clean drum then flush area with water.</li> </ul>   |
| <b>Major Spills</b> | <ul style="list-style-type: none"> <li>▶ Clear area of personnel and move upwind.</li> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> <li>▶ Wear full body protective clothing with breathing apparatus.</li> <li>▶ Prevent, by any means available, spillage from entering drains or water course.</li> <li>▶ Stop leak if safe to do so.</li> <li>▶ Contain spill with sand, earth or vermiculite.</li> <li>▶ Collect recoverable product into labelled containers for recycling.</li> <li>▶ Neutralise/decontaminate residue (see Section 13 for specific agent).</li> </ul> |

Personal Protective Equipment advice is contained in Section 8 of the SDS.

## SECTION 7 Handling and storage

### Precautions for safe handling

|                          |  |
|--------------------------|--|
| <b>Safe handling</b>     | <ul style="list-style-type: none"> <li>▶ Avoid all personal contact, including inhalation.</li> <li>▶ Wear protective clothing when risk of exposure occurs.</li> <li>▶ Use in a well-ventilated area.</li> <li>▶ Prevent concentration in hollows and sumps.</li> <li>▶ <b>DO NOT enter confined spaces until atmosphere has been checked.</b></li> <li>▶ <b>DO NOT allow material to contact humans, exposed food or food utensils.</b></li> <li>▶ Avoid contact with incompatible materials.</li> <li>▶ <b>When handling, DO NOT eat, drink or smoke.</b></li> </ul>  |
| <b>Other information</b> | <p>Consider storage under inert gas.</p> <ul style="list-style-type: none"> <li>▶ Material is hygroscopic, i.e. absorbs moisture from the air. Keep containers well sealed in storage.</li> <li>▶ Store in original containers.</li> <li>▶ Keep containers securely sealed.</li> <li>▶ Store in a cool, dry, well-ventilated area.</li> <li>▶ Store away from incompatible materials and foodstuff containers.</li> <li>▶ Protect containers against physical damage and check regularly for leaks.</li> <li>▶ Observe manufacturer's storage and handling recommendations contained within this SDS.</li> </ul> |

### Conditions for safe storage, including any incompatibilities

|                                |   |
|--------------------------------|---|
| <b>Suitable container</b>      | <ul style="list-style-type: none"> <li>▶ Lined metal can, lined metal pail/ can.</li> <li>▶ Plastic pail.</li> <li>▶ Polyliner drum.</li> <li>▶ Packing as recommended by manufacturer.</li> <li>▶ Check all containers are clearly labelled and free from leaks.</li> </ul> <p>For low viscosity materials</p> <ul style="list-style-type: none"> <li>▶ Drums and jerricans must be of the non-removable head type.</li> <li>▶ Where a can is to be used as an inner package, the can must have a screwed enclosure.</li> </ul> <p>For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids (between 15 C deg. and 40 deg C.):</p> <ul style="list-style-type: none"> <li>▶ Removable head packaging;</li> <li>▶ Cans with friction closures and</li> <li>▶ low pressure tubes and cartridges</li> </ul> <p>may be used.</p> <p>-</p> <p>Where combination packages are used, and the inner packages are of glass, there must be sufficient inert cushioning material in contact with inner and outer packages *.</p> <p>-</p> <p>In addition, where inner packagings are glass and contain liquids of packing group I and II there must be sufficient inert absorbent to absorb any spillage *.</p> <p>-</p> <p>* unless the outer packaging is a close fitting moulded plastic box and the substances are not incompatible with the plastic.</p> <p>All inner and sole packagings for substances that have been assigned to Packaging Groups I or II on the basis of inhalation toxicity criteria, must be hermetically sealed.</p> |
| <b>Storage incompatibility</b> | <p>Derivative of electropositive metal.</p> <ul style="list-style-type: none"> <li>▶ <b>WARNING:</b> Avoid or control reaction with peroxides. All <i>transition metal</i> peroxides should be considered as potentially explosive. For example transition metal complexes of alkyl hydroperoxides may decompose explosively.</li> <li>▶ The pi-complexes formed between chromium(0), vanadium(0) and other transition metals (haloarene-metal complexes) and mono- or poly-fluorobenzene show extreme sensitivity to heat and are explosive.</li> <li>▶ Avoid reaction with borohydrides or cyanoborohydrides</li> <li>▶ Metals and their oxides or salts may react violently with chlorine trifluoride and bromine trifluoride.</li> <li>▶ These trifluorides are hypergolic oxidisers. They ignite on contact (without external source of heat or ignition) with recognised fuels - contact with these materials, following an ambient or slightly elevated temperature, is often violent and may produce ignition.</li> <li>▶ The state of subdivision may affect the results.</li> </ul> <p>Cobalt chloride</p> <ul style="list-style-type: none"> <li>▶ reacts with strong oxidisers, acetylene</li> <li>▶ in contact with acid or acid fumes produces toxic chlorides</li> <li>▶ is incompatible with metals: can cause pitting attack and stress corrosion in austenitic stainless steels</li> </ul>  |

## SECTION 8 Exposure controls / personal protection

### Control parameters

#### Occupational Exposure Limits (OEL)

#### INGREDIENT DATA

Not Available

#### Emergency Limits

| Ingredient                | Material name                   | TEEL-1     | TEEL-2   | TEEL-3    |
|---------------------------|---------------------------------|------------|----------|-----------|
| Cobalt Chloride Anhydrous | Cobalt chloride                 | 0.13 mg/m3 | 18 mg/m3 | 83 mg/m3  |
| Cobalt Chloride Anhydrous | Cobalt(II) chloride hexahydrate | 0.24 mg/m3 | 25 mg/m3 | 150 mg/m3 |

| Ingredient                | Original IDLH | Revised IDLH  |
|---------------------------|---------------|---------------|
| Cobalt Chloride Anhydrous | Not Available | Not Available |

#### Occupational Exposure Banding

| Ingredient                | Occupational Exposure Band Rating | Occupational Exposure Band Limit |
|---------------------------|-----------------------------------|----------------------------------|
| Cobalt Chloride Anhydrous | E                                 | ≤ 0.01 mg/m <sup>3</sup>         |

**Notes:** Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.

### Exposure controls

|   |  |
|---|--|
| <b>Appropriate engineering controls</b> | <p>Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are:</p> <p>Process controls which involve changing the way a job activity or process is done to reduce the risk.</p> <p>Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.</p> <p>Employers may need to use multiple types of controls to prevent employee overexposure.</p> <p>Local exhaust ventilation usually required.</p>  |
| <b>Personal protection</b>              |   |
| <b>Eye and face protection</b>          | <ul style="list-style-type: none"> <li>▶ Safety glasses with side shields.</li> <li>▶ Chemical goggles.</li> <li>▶ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly.</li> </ul>   |
| <b>Skin protection</b>                  | See Hand protection below  |
| <b>Hands/feet protection</b>            | <ul style="list-style-type: none"> <li>▶ Wear chemical protective gloves, e.g. PVC.</li> <li>▶ Wear safety footwear or safety gumboots, e.g. Rubber</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>▶ The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.</li> <li>▶ Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed.</li> </ul> <p>The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical 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.</p> <p>The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.</p> <p>Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.</p> <p>Suitability and durability of glove type is dependent on usage.</p> |
| <b>Body protection</b>                  | See Other protection below   |
| <b>Other protection</b>                 | <ul style="list-style-type: none"> <li>▶ Overalls.</li> <li>▶ Eyewash unit.</li> <li>▶ Barrier cream.</li> <li>▶ Skin cleansing cream.</li> </ul>  |

### Respiratory protection

- ▶ Respirators may be necessary when engineering and administrative controls do not adequately prevent exposures.
- ▶ The decision to use respiratory protection should be based on professional judgment that takes into account toxicity information, exposure measurement data, and frequency and likelihood of the worker's exposure - ensure users are not subject to high thermal loads which may result in heat stress or distress due to personal protective equipment (powered, positive flow, full face apparatus may be an option).
- ▶ Published occupational exposure limits, where they exist, will assist in determining the adequacy of the selected respiratory protection. These may be government mandated or vendor recommended.
- ▶ Certified respirators will be useful for protecting workers from inhalation of particulates when properly selected and fit tested as part of a complete respiratory protection program.
- ▶ Use approved positive flow mask if significant quantities of dust becomes airborne.
- ▶ Try to avoid creating dust conditions.

## SECTION 9 Physical and chemical properties

### Information on basic physical and chemical properties

|   |  |  |                  |
|---|--|--|------------------|
| <b>Appearance</b>                                   | Material is hygroscopic, absorbs moisture from surrounding air. Odourless, pale blue crystals (leaflets). No odour. Thin layers or powders may be colourless. Changes colour as it absorbs moisture, turns pink on exposure to moist air. Soluble in water (450 g/L cold, 1050 g/L hot); also soluble in alcohol, acetone and methanol, slightly soluble in ether. Solution in water is a clear, red-purple liquid |  |                  |
| <b>Physical state</b>                               | Divided Solid  | <b>Relative density (Water = 1)</b>            | 3.356 - 3.367    |
| <b>Odour</b>  | Not Available  | <b>Partition coefficient n-octanol / water</b> | Not Available    |
| <b>Odour threshold</b>                              | Not Available  | <b>Auto-ignition temperature (°C)</b>          | Not Applicable   |
| <b>pH (as supplied)</b>                             | Not Applicable   | <b>Decomposition temperature</b>               | Not Applicable   |
| <b>Melting point / freezing point (°C)</b>          | 735  | <b>Viscosity (cSt)</b>                         | Not Applicable   |
| <b>Initial boiling point and boiling range (°C)</b> | 1049   | <b>Molecular weight (g/mol)</b>                | 129.85           |
| <b>Flash point (°C)</b>                             | Not Applicable   | <b>Taste</b>                                   | Not Available    |
| <b>Evaporation rate</b>                             | Not Applicable   | <b>Explosive properties</b>                    | Not Available    |
| <b>Flammability</b>                                 | Not Applicable   | <b>Oxidising properties</b>                    | Not Available    |
| <b>Upper Explosive Limit (%)</b>                    | Not Applicable   | <b>Surface Tension (dyn/cm or mN/m)</b>        | Not Applicable   |
| <b>Lower Explosive Limit (%)</b>                    | Not Applicable   | <b>Volatile Component (%vol)</b>               | Negligible       |
| <b>Vapour pressure (kPa)</b>                        | Negligible   | <b>Gas group</b>                               | Not Available    |
| <b>Solubility in water</b>                          | Miscible   | <b>pH as a solution (1%)</b>                   | 4.2 @ 2.6% =0.2M |
| <b>Vapour density (Air = 1)</b>                     | Not Applicable   | <b>VOC g/L</b>                                 | Not Applicable   |

## SECTION 10 Stability and reactivity

|   |  |
|---|--|
| <b>Reactivity</b>                         | See section 7  |
| <b>Chemical stability</b>                 | <ul style="list-style-type: none"> <li>▶ Unstable in the presence of incompatible materials.</li> <li>▶ Product is considered stable.</li> <li>▶ Hazardous polymerisation will not occur.</li> </ul> |
| <b>Possibility of hazardous reactions</b> | See section 7  |
| <b>Conditions to avoid</b>                | See section 7  |
| <b>Incompatible materials</b>             | See section 7  |
| <b>Hazardous decomposition products</b>   | See section 5  |

## SECTION 11 Toxicological information

### Information on toxicological effects

|                     |  |
|---------------------|--|
| <b>Inhaled</b>      | <p>The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models). Nevertheless inhalation of dusts, or fumes, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.</p> <p>Inhalation of dusts, generated by the material during the course of normal handling, may produce serious damage to the health of the individual. Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.</p> <p>If prior damage to the circulatory or nervous systems has occurred or if kidney damage has been sustained, proper screenings should be conducted on individuals who may be exposed to further risk if handling and use of the material result in excessive exposures.</p> <p>Cobalt poisoning can cause inflammation of the terminal airways (bronchioles), and cause lethargy and death within hours.</p> |
| <b>Ingestion</b>    | <p>In toxic doses soluble cobalt salts produce stomach pain and vomiting, flushing of the face and ears, rash, ringing in the ears, nervous deafness and reduced blood flow to the extremities.</p> <p>Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.</p>   |
| <b>Skin Contact</b> | <p>Skin contact is not thought to produce harmful health effects (as classified under EC Directives using animal models). Systemic harm, however, has been identified following exposure of animals by at least one other route and the material may still produce health damage following entry through wounds, lesions or abrasions.</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.</p>   |
| <b>Eye</b>          | <p>Although the material is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may cause transient discomfort characterised by tearing or conjunctival redness (as with windburn). Slight abrasive damage may also result.</p>  |
| <b>Chronic</b>      | <p>Studies show that inhaling this substance for over a long period (e.g. in an occupational setting) may increase the risk of cancer.</p> <p>Strong evidence exists that this substance may cause irreversible mutations (though not lethal) even following a single exposure.</p> <p>Inhaling this product is more likely to cause a sensitisation reaction in some persons compared to the general population.</p> <p>Skin contact with the material is more likely to cause a sensitisation reaction in some persons compared to the general population.</p> <p>Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.</p>   |

## COBALT CHLORIDE ANHYDROUS

|                           |   |  |
|---------------------------|---|--|
|                           | Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis, caused by particles less than 0.5 micron penetrating and remaining in the lung.<br>Inhalation of cobalt powder can induce asthma, chest tightness and chronic inflammation of the bronchi. Chronic exposure to cobalt causes increase in blood haemoglobin, increased production of cells in the blood marrow and thyroid gland, discharge from around the heart and damage to the alpha cells of the pancreas.<br>Critical effects following overexposure are asthma, lung and cardiovascular system. [ACGIH] |  |
| Cobalt Chloride Anhydrous | <b>TOXICITY</b>   | <b>IRRITATION</b>  |
|                           | 1500 mg/kg <sup>[2]</sup>   | Eye: adverse effect observed (irritating) <sup>[1]</sup>         |
|                           | Oral (rat) LD50: 80 mg/kg <sup>[2]</sup>  | Skin: no adverse effect observed (not irritating) <sup>[1]</sup> |
| <b>Legend:</b>            | 1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. * Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances   |  |

|                           |  |
|---------------------------|--|
| COBALT CHLORIDE ANHYDROUS | The following information refers to contact allergens as a group and may not be specific to this product.<br>Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitisation potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely distributed can be a more important allergen than one with stronger sensitising potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested.<br>Allergic reactions involving the respiratory tract are usually due to interactions between IgE antibodies and allergens and occur rapidly. Allergic potential of the allergen and period of exposure often determine the severity of symptoms. Some people may be genetically more prone than others, and exposure to other irritants may aggravate symptoms. Allergy causing activity is due to interactions with proteins.<br>Attention should be paid to atopic diathesis, characterised by increased susceptibility to nasal inflammation, asthma and eczema.<br>Exogenous allergic alveolitis is induced essentially by allergen specific immune-complexes of the IgG type; cell-mediated reactions (T lymphocytes) may be involved. Such allergy is of the delayed type with onset up to four hours following exposure. |
|                           | <b>WARNING:</b> This substance has been classified by the IARC as Group 2B: Possibly Carcinogenic to Humans.<br>Investigated as a tumorigen, mutagen and reproductive effector. Classified by EEC Directive as Category 2 Carcinogen. Cobalt chloride is an established chemical inducer of hypoxia-like responses such as erythropoiesis.   |

|                                   |   |                          |   |
|-----------------------------------|---|--------------------------|---|
| Acute Toxicity                    | ✓ | Carcinogenicity          | ✗ |
| Skin Irritation/Corrosion         | ✗ | Reproductivity           | ✓ |
| Serious Eye Damage/Irritation     | ✗ | STOT - Single Exposure   | ✗ |
| Respiratory or Skin sensitisation | ✓ | STOT - Repeated Exposure | ✗ |
| Mutagenicity                      | ✓ | Aspiration Hazard        | ✗ |

**Legend:** ✗ – Data either not available or does not fill the criteria for classification  
✓ – Data available to make classification

## SECTION 12 Ecological information

## Toxicity

| Cobalt Chloride Anhydrous | Endpoint | Test Duration (hr) | Species                       | Value            | Source          |
|---------------------------|----------|--------------------|-------------------------------|------------------|-----------------|
|                           |          | LC50               | 96                            | Fish             | 0.001-0.406mg/L |
|                           | EC50     | 48                 | Crustacea                     | 0.002-0.618mg/L  | 2               |
|                           | EC50     | 96                 | Algae or other aquatic plants | 0.071-0.314mg/L  | 2               |
|                           | NOEC     | 96                 | Crustacea                     | 0.001-0.2819mg/L | 2               |

**Legend:** Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.

Wastes resulting from use of the product must be disposed of on site or at approved waste sites.

For Metal:

Atmospheric Fate - Metal-containing inorganic substances generally have negligible vapour pressure and are not expected to partition to air.

Environmental Fate: Environmental processes, such as oxidation, the presence of acids or bases and microbiological processes, may transform insoluble metals to more soluble ionic forms. Environmental processes may enhance bioavailability and may also be important in changing solubilities.

Aquatic/Terrestrial Fate: When released to dry soil, most metals will exhibit limited mobility and remain in the upper layer; some will leach locally into ground water and/ or surface water ecosystems when soaked by rain or melt ice. A metal ion is considered infinitely persistent because it cannot degrade further. Once released to surface waters and moist soils their fate depends on solubility and dissociation in water. A significant proportion of dissolved/ sorbed metals will end up in sediments through the settling of suspended particles. The remaining metal ions can then be taken up by aquatic organisms. Ionic species may bind to dissolved ligands or sorb to solid particles in water.

For Chloride: Although inorganic chloride ions are not normally considered toxic they can exist in effluents at acutely toxic levels. Incidental exposure to inorganic chloride may occur in occupational settings where chemicals management policies are improperly applied. The toxicity of chloride salts depends on the counter-ion (cation) present; that of chloride itself is unknown. Chloride toxicity has not been observed in humans except in the special case of impaired sodium chloride metabolism, e.g. in congestive heart failure. Healthy individuals can tolerate the intake of large quantities of chloride provided that there is an intake of fresh water following ingestion. Although excessive intake of drinking-water containing sodium chloride at concentrations above 2.5 g/L has been reported to produce hypertension, this effect is believed to be related to the sodium ion concentration. Chloride concentrations in excess of about 250 mg/L can give rise to detectable taste in water. Consumers can, however, become accustomed to concentrations in excess of 250 mg/L.

For Cobalt Compounds:

Environmental Fate: The sources of cobalt in the atmosphere are both natural and man-made. The primary man-made sources of cobalt are the burning of fossil fuels, phosphate fertilizers, mining/smelting/processing of cobalt containing ores, etc.

Atmospheric Fate: Cobalt does not vaporize thus; it enters the air in particulate form. The transport of cobalt, in air, depends on its particle size and density, as well as weather conditions; it can be returned to land or surface water by rain or, it may settle to the ground by dry deposition.

Terrestrial Fate: Soil ♦ Cobalt is a naturally occurring substance in the Earth's crust. Cobalt may be retained by mineral oxides such as iron and manganese oxide, crystalline

**COBALT CHLORIDE ANHYDROUS**

materials, and natural organic substances, in soil. Sorption of cobalt to soil occurs rapidly, (within 1-2 hours). Clay minerals sorb relatively small amounts of cobalt.  
**DO NOT discharge into sewer or waterways.**

**Persistence and degradability**

| Ingredient                | Persistence: Water/Soil | Persistence: Air |
|---------------------------|-------------------------|------------------|
| Cobalt Chloride Anhydrous | HIGH                    | HIGH             |

**Bioaccumulative potential**

| Ingredient                | Bioaccumulation       |
|---------------------------|-----------------------|
| Cobalt Chloride Anhydrous | LOW (LogKOW = 0.8494) |

**Mobility in soil**

| Ingredient                | Mobility          |
|---------------------------|-------------------|
| Cobalt Chloride Anhydrous | LOW (KOC = 23.74) |

**SECTION 13 Disposal considerations**

**Waste treatment methods**

|                                     |  |
|-------------------------------------|--|
| <b>Product / Packaging disposal</b> | <ul style="list-style-type: none"> <li>▶ Containers may still present a chemical hazard/ danger when empty.</li> <li>▶ Return to supplier for reuse/ recycling if possible.</li> </ul> <p>Otherwise:</p> <ul style="list-style-type: none"> <li>▶ If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.</li> <li>▶ Where possible retain label warnings and SDS and observe all notices pertaining to the product.</li> </ul> <p>Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.</p> <p>A Hierarchy of Controls seems to be common - the user should investigate:</p> <ul style="list-style-type: none"> <li>▶ Reduction</li> <li>▶ Reuse</li> <li>▶ Recycling</li> <li>▶ Disposal (if all else fails)</li> </ul> <p>This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate. In most instances the supplier of the material should be consulted.</p> <ul style="list-style-type: none"> <li>▶ <b>DO NOT allow wash water from cleaning or process equipment to enter drains.</b></li> <li>▶ It may be necessary to collect all wash water for treatment before disposal.</li> <li>▶ In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.</li> <li>▶ Where in doubt contact the responsible authority.</li> <li>▶ Recycle wherever possible or consult manufacturer for recycling options.</li> <li>▶ Consult State Land Waste Management Authority for disposal.</li> <li>▶ Bury residue in an authorised landfill.</li> <li>▶ Recycle containers if possible, or dispose of in an authorised landfill.</li> </ul> |
|-------------------------------------|--|

**SECTION 14 Transport information**

**Labels Required**

|                         |   |
|-------------------------|---|
|                         |  |
| <b>Marine Pollutant</b> |  |
| <b>HAZCHEM</b>          | 2X  |

**Land transport (ADG)**

|                                     |   |                |
|-------------------------------------|---|----------------|
| <b>UN number</b>                    | 3288  |                |
| <b>UN proper shipping name</b>      | TOXIC SOLID, INORGANIC, N.O.S. (contains Cobalt Chloride Anhydrous) |                |
| <b>Transport hazard class(es)</b>   | Class   | 6.1            |
|                                     | Subrisk   | Not Applicable |
| <b>Packing group</b>                | II  |                |
| <b>Environmental hazard</b>         | Environmentally hazardous   |                |
| <b>Special precautions for user</b> | Special provisions  | 274            |
|                                     | Limited quantity  | 500 g          |

**Air transport (ICAO-IATA / DGR)**

**COBALT CHLORIDE ANHYDROUS**

|                                     |   |                |
|-------------------------------------|---|----------------|
| <b>UN number</b>                    | 3288  |                |
| <b>UN proper shipping name</b>      | Toxic solid, inorganic, n.o.s. * (contains Cobalt Chloride Anhydrous) |                |
| <b>Transport hazard class(es)</b>   | ICAO/IATA Class   | 6.1            |
|                                     | ICAO / IATA Subrisk   | Not Applicable |
|                                     | ERG Code  | 6L             |
| <b>Packing group</b>                | II  |                |
| <b>Environmental hazard</b>         | Environmentally hazardous   |                |
| <b>Special precautions for user</b> | Special provisions  | A3 A5          |
|                                     | Cargo Only Packing Instructions                                       | 676            |
|                                     | Cargo Only Maximum Qty / Pack   | 100 kg         |
|                                     | Passenger and Cargo Packing Instructions                              | 669            |
|                                     | Passenger and Cargo Maximum Qty / Pack                                | 25 kg          |
|                                     | Passenger and Cargo Limited Quantity Packing Instructions             | Y644           |
|                                     | Passenger and Cargo Limited Maximum Qty / Pack                        | 1 kg           |

**Sea transport (IMDG-Code / GGVSee)**

|                                     |   |                |
|-------------------------------------|---|----------------|
| <b>UN number</b>                    | 3288  |                |
| <b>UN proper shipping name</b>      | TOXIC SOLID, INORGANIC, N.O.S. (contains Cobalt Chloride Anhydrous) |                |
| <b>Transport hazard class(es)</b>   | IMDG Class  | 6.1            |
|                                     | IMDG Subrisk  | Not Applicable |
| <b>Packing group</b>                | II  |                |
| <b>Environmental hazard</b>         | Marine Pollutant  |                |
| <b>Special precautions for user</b> | EMS Number  | F-A , S-A      |
|                                     | Special provisions  | 274            |
|                                     | Limited Quantities  | 500 g          |

**Transport in bulk according to Annex II of MARPOL and the IBC code**

Not Applicable

**SECTION 15 Regulatory information**

**Safety, health and environmental regulations / legislation specific for the substance or mixture**

**Cobalt Chloride Anhydrous is found on the following regulatory lists**

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals  
Australian Inventory of Industrial Chemicals (AIIC)  
Chemical Footprint Project - Chemicals of High Concern List

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs  
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B : Possibly carcinogenic to humans

**National Inventory Status**

| National Inventory            | Status   |
|-------------------------------|--|
| Australia - AIIC              | Yes  |
| Australia Non-Industrial Use  | No (Cobalt Chloride Anhydrous)   |
| Canada - DSL                  | Yes  |
| Canada - NDSL                 | No (Cobalt Chloride Anhydrous)   |
| China - IECSC                 | Yes  |
| Europe - EINEC / ELINCS / NLP | Yes  |
| Japan - ENCS                  | Yes  |
| Korea - KECI                  | Yes  |
| New Zealand - NZIoC           | Yes  |
| Philippines - PICCS           | Yes  |
| USA - TSCA                    | Yes  |
| Taiwan - TCSI                 | Yes  |
| Mexico - INSQ                 | Yes  |
| Vietnam - NCI                 | Yes  |
| Russia - ARIPS                | Yes  |
| <b>Legend:</b>                | Yes = All CAS declared ingredients are on the inventory<br>No = One or more of the CAS listed ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets) |

**SECTION 16 Other information**

|                      |               |
|----------------------|---------------|
| <b>Revision Date</b> | 21/12/2017    |
| <b>Initial Date</b>  | Not Available |

**SDS Version Summary**

| Version | Issue Date | Sections Updated   |
|---------|------------|--|
| 7.1.1.1 | 21/12/2017 | Acute Health (swallowed), Chronic Health, Classification, Physical Properties, Storage (storage incompatibility), Storage (storage requirement), Toxicity and Irritation (Other) |

**Other information**

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

**Definitions and abbreviations**

PC—TWA: Permissible Concentration-Time Weighted Average  
PC—STEL: Permissible Concentration-Short Term Exposure Limit  
IARC: International Agency for Research on Cancer  
ACGIH: American Conference of Governmental Industrial Hygienists  
STEL: Short Term Exposure Limit  
TEEL: Temporary Emergency Exposure Limit  
IDLH: Immediately Dangerous to Life or Health Concentrations  
OSF: Odour Safety Factor  
NOAEL :No Observed Adverse Effect Level  
LOAEL: Lowest Observed Adverse Effect Level  
TLV: Threshold Limit Value  
LOD: Limit Of Detection  
OTV: Odour Threshold Value  
BCF: BioConcentration Factors  
BEI: Biological Exposure Index

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