AMMONIUM DICHROMATE

SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

Product Identifier

<table>
<thead>
<tr>
<th>Product name</th>
<th>AMMONIUM DICHROMATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Name</td>
<td>ammonium dichromate</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Cr2-H8-N2-O7; (NH4)2Cr2O7; dichromic acid, diammonium salt; ammonium bichromate; ammonium dichromate (VI)</td>
</tr>
<tr>
<td>Proper shipping name</td>
<td>AMMONIUM DICHROMATE</td>
</tr>
<tr>
<td>Chemical formula</td>
<td>Cr2H2O7.2H3N</td>
</tr>
<tr>
<td>Other means of identification</td>
<td>Not Available</td>
</tr>
<tr>
<td>CAS number</td>
<td>7789-09-5</td>
</tr>
</tbody>
</table>

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

Relevant identified uses
Mordant for dyeing, pigments, production of alizarin, chrome alum, oil purification, pickling, manufacture of catalysts, leather tanning, synthetic perfumes, photography, process engraving and lithography. Also used in production of chromic oxide and pyrotechnics.

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 numbers

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

<table>
<thead>
<tr>
<th>Flammability</th>
<th>0 = Minimum</th>
<th>1 = Low</th>
<th>2 = Moderate</th>
<th>3 = High</th>
<th>4 = Extreme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Body Contact</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reactivity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chronic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Poisons Schedule
S6

Classification [1]
Carcinogenicity Category 1A, Acute Toxicity (Inhalation) Category 2, Reproductive Toxicity Category 1B, Specific target organ toxicity - repeated exposure Category 1, Oxidizing Solid Category 2, Serious Eye Damage Category 1, Chronic Aquatic Hazard Category 1, Acute Toxicity (Oral) Category 3, Respiratory Sensitizer Category 1, Acute Toxicity (Dermal) Category 4, Skin Corrosion/ Irritation Category 1B, Skin Sensitizer Category 1, Acute Aquatic Hazard Category 1, Germ cell mutagenicity Category 1B

Legend:

Label elements

Continued...
Hazard pictogram(s)

SIGNAL WORD DANGER

Hazard statement(s)

- H350: May cause cancer.
- H330: Fatal if inhaled.
- H360: May damage fertility or the unborn child.
- H372: Causes damage to organs through prolonged or repeated exposure.
- H272: May intensify fire; oxidiser.
- H410: Very toxic to aquatic life with long lasting effects.
- H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
- H312: Harmful in contact with skin.
- H314: Causes severe skin burns and eye damage.
- H317: May cause an allergic skin reaction.
- H340: May cause genetic defects.

Precautionary statement(s)

Prevention

- P201: Obtain special instructions before use.
- P210: Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
- P221: Take any precaution to avoid mixing with combustibles/organic material.
- P260: Do not breathe dust/fume.
- P270: Do not eat, drink or smoke when using this product.
- P271: Use only outdoors or in a well-ventilated area.
- P280: Wear protective gloves/protective clothing/eye protection/face protection.
- P281: Use personal protective equipment as required.

Response

- P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
- P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
- P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P308+P313: IF exposed or concerned: Get medical advice/attention.
- P320: Specific treatment is urgent (see advice on this label).
- P322: Specific measures (see advice on this label).

Storage

- P403+P233: Store in a well-ventilated place. Keep container tightly closed.
- P405: Store locked up.

Disposal

- P501: 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

<table>
<thead>
<tr>
<th>CAS No</th>
<th>%[weight]</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>7789-09-5</td>
<td>&gt;=99</td>
<td>ammonium dichromate</td>
</tr>
</tbody>
</table>

Mixtures

See section above for composition of Substances

SECTION 4 FIRST AID MEASURES

Description of first aid measures

Eye Contact

If this product comes in contact with the eyes:

- Immediately hold eyelids apart and flush the eye continuously with running water.
Extinguishing media

FOR SMALL FIRE:
- USE FLOODING QUANTITIES OF WATER.
- DO NOT USE DRY CHEMICAL, CO2, FOAM OR HALOGENATED-TYPE EXTINGUISHERS.

FOR LARGE FIRE
- Flood fire area with water from a protected position

Special hazards arising from the substrate or mixture

<table>
<thead>
<tr>
<th>Fire Incompatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoid storage with reducing agents.</td>
</tr>
<tr>
<td>Avoid any contamination of this material as it is very reactive and any contamination is potentially hazardous</td>
</tr>
</tbody>
</table>

Advice for firefighters

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water courses.
- Fight fire from a safe distance, with adequate cover.
- Extinguishers should be used only by trained personnel.
- Use water delivered as a fine spray to control fire and cool adjacent area.
- Avoid spraying water onto liquid pools.
- DO NOT approach containers suspected to be hot.
- Use water delivered as a fine spray to control fire and cool adjacent area.
- Do not approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

Fire/Explosion Hazard

- Will not burn but increases intensity of fire.
- Heating may cause expansion or decomposition leading to violent rupture of containers.
- Heat affected containers remain hazardous.
- Contact with combustibles such as wood, paper, oil or finely divided metal may produce spontaneous combustion or violent decomposition.
- May emit irritating, poisonous or corrosive fumes.
- Decomposition may produce toxic fumes of: nitrogen oxides (NOx)
- metal oxides

**WARNING:** May EXPLODE on heating!!!

Thermal decomposition of ammonium dichromate is initiated by local heating to 190 deg c. Flame and sparks may spread rapidly through mass if confined. May become explosive. Under close confinement the deflagrating salt shows an extraordinary high rate of pressure increase.
SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 8

Methods and material for containment and cleaning up

- Clean up all spills immediately.
- No smoking, naked lights, ignition sources.
- Avoid all contact with any organic matter including fuel, solvents, sawdust, paper or cloth and other incompatible materials, as ignition may result.
- Avoid breathing dust or vapours and all contact with skin and eyes.
- Control personal contact with the substance, by using protective equipment.
- Contain and absorb spill with dry sand, earth, inert material or vermiculite.
- **DO NOT use sawdust as fire may result.**
- Scoop up solid residues and seal in labelled drums for disposal.

### Minor Spills
- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- Provide adequate ventilation.
- Always wear protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water courses.
- No smoking, flames or ignition sources. Increase ventilation.
- Contain spill with sand, earth or other clean, inert materials.
- **NEVER USE** organic absorbents such as sawdust, paper or cloth.

### Major Spills
- Store in original containers.
- Keep containers securely sealed as supplied.
- Store in a cool, well ventilated area.
- Keep dry.
- Store under cover and away from sunlight.
- Store away from flammable or combustible materials, debris and waste. Contact may cause fire or violent reaction.
- Store away from incompatible materials and foodstuff containers.
- In addition, Goods of Class 5.1, packing group II should be:
  - stored in piles so that
  - the height of the pile does not exceed 1 metre
  - the maximum quantity in a pile or building does not exceed 1000 tonnes unless the area is provided with automatic fire extinguishers
  - the maximum height of a pile does not exceed 3 metres where the room is provided with automatic fire extinguishers or 2 meters if not.
  - the minimum distance between piles is not less than 2 metres where the room is provided with automatic fire extinguishers or 3 meters if not.
  - the minimum distance to walls is not less than 1 metre.

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

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling

<table>
<thead>
<tr>
<th>Safe handling</th>
<th>Other information</th>
</tr>
</thead>
<tbody>
<tr>
<td>For oxidisers, including peroxides.</td>
<td>For low viscosity materials</td>
</tr>
<tr>
<td>Avoid personal contact and inhalation of dust, mist or vapours.</td>
<td>Drums and jerricans must be of the non-removable head type.</td>
</tr>
<tr>
<td>Provide adequate ventilation.</td>
<td>Where a can is to be used as an inner package, the can must have a screwed enclosure.</td>
</tr>
<tr>
<td>Always wear protective equipment and wash off any spillage from clothing.</td>
<td>For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids:</td>
</tr>
<tr>
<td>Keep material away from light, heat, flammables or combustibles.</td>
<td>- Removable head packaging and</td>
</tr>
<tr>
<td>Keep cool, dry and away from incompatible materials.</td>
<td>- cans with friction closures may be used.</td>
</tr>
</tbody>
</table>
| Avoid physical damage to containers. | 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 *.
| **DO NOT** repack or return unused portions to original containers. | 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 *.

Conditions for safe storage, including any incompatibilities

<table>
<thead>
<tr>
<th>Suitable container</th>
<th>Storage incompatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DO NOT</strong> repack. Use containers supplied by manufacturer only.</td>
<td><strong>WARNING:</strong> Avoid or control reaction with peroxides. All transition metal peroxides should be considered as potentially explosive. For example transition metal complexes of alkyl hydroperoxides may decompose explosively.</td>
</tr>
<tr>
<td>For low viscosity materials</td>
<td>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.</td>
</tr>
<tr>
<td>Drums and jerricans must be of the non-removable head type.</td>
<td>Avoid reaction with borohydrides or cyanoborohydrides</td>
</tr>
<tr>
<td>Where a can is to be used as an inner package, the can must have a screwed enclosure.</td>
<td>Inorganic reducing agents react with oxidizing agents to generate heat and products that may be flammable, combustible, or otherwise reactive. Their reactions with oxidizing agents may be violent.</td>
</tr>
<tr>
<td>For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids:</td>
<td>Incidents involving interaction of active oxidants and reducing agents, either by design or accident, are usually very energetic and examples of so-called redox reactions.</td>
</tr>
<tr>
<td>- Removable head packaging and</td>
<td>- Avoid any contamination of this material as it is very reactive and any contamination is potentially hazardous</td>
</tr>
<tr>
<td>- cans with friction closures may be used.</td>
<td></td>
</tr>
</tbody>
</table>

Continued...
### Inorganic Peroxy Compounds

- Inorganic peroxy compounds are potent oxidisers that pose fire or explosive hazards when in contact with ordinary combustible materials.
- Inorganic peroxy compounds react with organic compounds to generate organic peroxy and hydroperoxide products that react violently with reducing agents.
- Inorganic peroxy compounds can react with reducing agents to generate heat and products that may be gaseous (causing pressurization of closed containers). The products may themselves be capable of further reactions (such as combustion in the air).
- Organic compounds in general have some reducing power and can in principle react with compounds in this class. Actual reactivity varies greatly with the identity of the organic compound.
- Inorganic peroxy compounds react violently with active metals, cyanides, esters, and thiocyanates.
- Peroxides, in contact with inorganic cobalt and copper compounds, iron and iron compounds, acetone, metal oxide salts and acids and bases can react with rapid, uncontrolled decomposition, leading to fires and explosions.
- Metals and their oxides or salts may react violently with chlorine trifluoride and bromine trifluoride.
- 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.
- The state of subdivision may affect the results.
- Avoid storage with reducing agents.
- Avoid reaction with potassium chloride and sodium nitrate.

### SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

#### Control parameters

**OCCUPATIONAL EXPOSURE LIMITS (OEL)**

#### INGREDIENT DATA

<table>
<thead>
<tr>
<th>Source</th>
<th>Ingredient</th>
<th>Material name</th>
<th>TWA</th>
<th>STEL</th>
<th>Peak</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia Exposure Standards</td>
<td>ammonium dichromate</td>
<td>Chromium (VI) compounds (as Cr), water soluble</td>
<td>0.05 mg/m³</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

### EMERGENCY LIMITS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Material name</th>
<th>TEEL-1</th>
<th>TEEL-2</th>
<th>TEEL-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>ammonium dichromate</td>
<td>Ammonium dichromate</td>
<td>0.37 mg/m³</td>
<td>6.3 mg/m³</td>
<td>38 mg/m³</td>
</tr>
</tbody>
</table>

**Exposure controls**

**Appropriate engineering controls**

- 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: Process controls which involve changing the way a job activity or process is done to reduce the risk, 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. Employers may need to use multiple types of controls to prevent employee overexposure.

- Employees exposed to confirmed human carcinogens should be authorized to do so by the employer, and work in a regulated area.

**Personal protection**

- Chemical goggles.
- Full face shield may be required for supplementary but never for primary protection of eyes.
- 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 adhesion 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.

**Eye and face protection**

- Chemical goggles.
- Full face shield may be required for supplementary but never for primary protection of eyes.
- 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 adhesion 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.

**Skin protection**

- See Hand protection below

**Hands/feet protection**

- Wear chemical protective gloves, e.g. PVC.
- Wear safety footwear or safety gumboots, e.g. Rubber
- Wear safety footwear or safety gumboots, e.g. Rubber
- Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed.
- 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.
- 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.
- 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. Suitability and durability of glove type is dependent on usage.
- **DO NOT** wear cotton or cotton-backed gloves.
- **DO NOT** wear leather gloves.
- Promptly hose all spills off leather shoes or boots or ensure that such footwear is protected with PVC over-shoes.

**Body protection**

- See Other protection below

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*Chemwatch: 1439*  
*Version No: 4.1.1.1*  
*Page 5 of 11*  
*Issue Date: 04/12/2017*  
*Print Date: 14/11/2019*
SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

| Appearance | Odourless, bright orange-red crystals or powder. Soluble in water (36.4g/100g water @ 20 C) and alcohol. The material is a strong oxidiser, but a saturated aqueous solution is not Class 5.1 dangerous goods. |
| Physical state | Divided Solid | Relative density (Water = 1) | 2.15 |
| Odour | Not Available | Partition coefficient n-octanol / water | Not Available |
| Odour threshold | Not Available | Auto-ignition temperature (°C) | 225 |
| pH (as supplied) | Not Applicable | Decomposition temperature | 190 |
| Melting point / freezing point (°C) | 180 (decomposes) | Viscosity (cSt) | Not Applicable |
| Initial boiling point and boiling range (°C) | Not Applicable | Molecular weight (g/mol) | 252.10 |
| Flash point (°C) | Not Applicable | Taste | Not Available |
| Evaporation rate | Not Applicable | Explosive properties | Not Available |
| Flammability | Not Applicable | Oxidising properties | Not Available |
| Upper Explosive Limit (%) | Not Applicable | Surface Tension (dyn/cm or mN/m) | Not Applicable |
| Lower Explosive Limit (%) | Not Applicable | Volatile Component (%vol) | Not Applicable |
SECTION 10 STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Reactivity</th>
<th>See section 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical stability</td>
<td></td>
</tr>
<tr>
<td>Unstable in the presence of incompatible materials.</td>
<td></td>
</tr>
<tr>
<td>Product is considered stable under normal handling conditions.</td>
<td></td>
</tr>
<tr>
<td>Prolonged exposure to heat.</td>
<td></td>
</tr>
<tr>
<td>Hazardous polymerisation will not occur.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Possibility of hazardous reactions</th>
<th>See section 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions to avoid</td>
<td>See section 7</td>
</tr>
<tr>
<td>Incompatible materials</td>
<td>See section 7</td>
</tr>
<tr>
<td>Hazardous decomposition products</td>
<td>See section 5</td>
</tr>
</tbody>
</table>

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

**Inhaled**

Inhalation of dusts, generated by the material, during the course of normal handling, may produce toxic effects. 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.

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.

Chrome fume is irritating to the respiratory tract and lungs. Exposure to chromium at certain oxidation levels (e.g. Cr-VI) may cause irritation to mucous membranes with symptoms such as sneezing, rhinorrhoea, lesions of the nasal septum, irritation and redness of the throat and generalised bronchospasm.

Inhalation of chromium fumes may cause metal fume fever characterised by flu-like symptoms, fever, chill, nausea, weakness and body aches. Toxic effects result from over-exposure. Asthmatic conditions may result as a consequence of the sensitising action of chrome VI compounds.

Inhalation of dusts may produce sore throat, coughing, shortness of breath and laboured breathing.

**Ingestion**

Toxic effects may result from the accidental ingestion of the material; animal experiments indicate that ingestion of less than 40 gram may be fatal or may produce serious damage to the health of the individual.

The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion.

Chromate salts are corrosive and produce cellular damage to tissue. Ingestion may produce inflammation of the digestive tract, nausea, vomiting and abdominal pain.

Large doses of ammonia or injected ammonium salts may produce diarrhoea and may be sufficiently absorbed to produce increased production of urine and systemic poisoning. Symptoms include weakening of facial muscle, tremor, anxiety, reduced muscle and limb control.

**Skin Contact**

Skin contact with the material may be harmful; systemic effects may result following absorption.

The material can produce chemical burns following direct contact with the skin.

Chrome fume, as the chrome VI oxide, is corrosive to the skin and may aggravate pre-existing skin conditions such as dermatitis and eczema. As a potential skin sensissiser, the fume may cause dermatoses to appear suddenly and without warning. Absorption of chrome VI compounds through the skin can cause systemic poisoning effecting the kidneys and liver.

Open cuts, abraded or irritated skin should not be exposed to this material.

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.

Contact with broken skin may cause ulcers (chrome sores) and absorption may cause systemic effects.

**Eye**

The material can produce chemical burns to the eye following direct contact. Vapours or mists may be extremely irritating.

If applied to the eyes, this material causes severe eye damage.

**Chronic**

Repeated or prolonged exposure to corrosives may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue.

Inhalating this product is more likely to cause a sensitisation reaction in some persons compared to the general population.

Skin contact with the material is more likely to cause a sensitisation reaction in some persons compared to the general population. There is sufficient evidence to suggest that this material directly causes cancer in humans.

Based on experiments and other information, there is ample evidence to presume that exposure to this material can cause genetic defects that can be inherited.

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

This material can cause serious damage if one is exposed to it for long periods. It can be assumed that it contains a substance which can produce severe defects.

Ample evidence exists from experimentation that reduced human fertility is directly caused by exposure to the material.

Ample evidence exists, from results in experimentation, that developmental disorders are directly caused by human exposure to the material. Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.

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.

Chromium (III) is an essential trace mineral. Chronic exposure to chromium (III) irritates the airways, malnourishes the liver and kidneys, causes fluid in the lungs, and adverse effects on white blood cells, and also increases the risk of developing lung cancer.

Kidney and liver damage have been reported. May produce pulmonary sensitisation or allergic asthma.

**ammonium dichromate**

<table>
<thead>
<tr>
<th>Toxicity</th>
<th>Irritation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dermal (rabbit) LD50: 1640 mg/kg[2]</td>
<td>Not Available</td>
</tr>
<tr>
<td>Oral (rat) LD50: 53.75 mg/kg[2]</td>
<td></td>
</tr>
</tbody>
</table>

Legend:

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
The following information refers to contact allergens as a group and may not be specific to this product. 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. 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. Attention should be paid to atopic diathesis, characterised by increased susceptibility to nasal inflammation, asthma and eczema. 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. Asthma-like symptoms may continue for months or even years after exposure to the material. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. On the other hand, industrial bronchitis is a disorder that occurs as a result of exposure due to high concentrations of irritating substance (often particles) and is completely reversible after exposure ceases. The disorder is characterized by difficulty breathing, cough and mucus production. No significant acute toxicological data identified in literature search.

WARNING: This substance has been classified by the IARC as Group 1: CARCINOGENIC TO HUMANS.

### SECTION 12 ECOLOGICAL INFORMATION

#### Toxicity

<table>
<thead>
<tr>
<th>ammonium dichromate</th>
<th>ENDPOINT</th>
<th>TEST DURATION (HR)</th>
<th>SPECIES</th>
<th>VALUE</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

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

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 Chromium: Chromium is poorly absorbed by cells found in microorganisms, plants and animals. Hexavalent chromium anions are readily transported into cells and toxicity is closely linked to the higher oxidation state.

Ecotoxicity - Toxicity in Aquatic Organisms: Chromium is harmful to aquatic organisms in very low concentrations. Organisms consumed by fish species are very sensitive to low levels of chromium. Chromium is toxic to fish although less so in warm water. Marked decreases in toxicity are found with increasing pH or water hardness; changes in salinity have little if any effect. Chromium appears to make fish more susceptible to infection. High concentrations can damage and/or accumulate in various fish tissues and in invertebrates such as snails and worms.

For Chromium:
- Aquatic Fate: Most chromium released into water will be deposited in the sediment. A small percentage of chromium can be found in soluble and insoluble forms with soluble chromium making up a very small percentage of the total chromium. Most of the soluble chromium is present as chromium (VI) and soluble chromium (III) complexes. In the aquatic phase, chromium (III) occurs mostly as suspended solids adsorbed onto clayish materials, organics, or iron oxide present in water. Soluble forms and suspended chromium can undergo intramfa transport. Chromium (VI) in water will eventually be reduced to chromium (III) by organic matter in the water. This process may be slower depending on the type and amount of organic material present and on the redox condition of the water. The reaction was generally faster under anaerobic than aerobic conditions.

For Ammonia:
- Atmospheric Fate: Ammonia reacts rapidly with available acids (mainly sulfuric, nitric, and sometimes hydrochloric acid) to form the corresponding salts. Ammonia is persistent in the air.
- Aquatic Fate: Biodegrades rapidly to nitrate, producing a high oxygen demand. Non-persistent in water (half-life 2 days).

Ecotoxicity: Moderately toxic to fish under normal temperature and pH conditions and harmful to aquatic life at low concentrations. Does not concentrate in food chain.

DO NOT discharge into sewer or waterways.

### Persistence and degradability

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Persistence: Water/Soil</th>
<th>Persistence: Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Data available for all ingredients</td>
<td>No Data available for all ingredients</td>
<td></td>
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</tbody>
</table>
Bioaccumulative potential

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Bioaccumulation</th>
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</thead>
<tbody>
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<td></td>
<td>No Data available for all ingredients</td>
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</tbody>
</table>

Mobility in soil

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Data available for all ingredients</td>
</tr>
</tbody>
</table>

SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

- Containers may still present a chemical hazard/danger when empty.
- Return to supplier for reuse/recycling if possible. Otherwise:
  - 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.
- Where possible retain label warnings and SDS and observe all notices pertaining to the product.

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.

A Hierarchy of Controls seems to be common - the user should investigate:
- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

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.

- DO NOT allow wash water from cleaning or process equipment to enter drains.
- It may be necessary to collect all wash water for treatment before disposal.
- In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
- Where in doubt contact the responsible authority.
- Recycle wherever possible or consult manufacturer for recycling options.
- Consult State Land Waste Management Authority for disposal.
- Bury residue in an authorised landfill.
- Recycle containers if possible, or dispose of in an authorised landfill.

For small quantities of oxidising agent:
- Cautiously acidify a 3% solution to pH 2 with sulfuric acid.
- Gradually add a 50% excess of sodium bisulfite solution with stirring.
- Add a further 10% sodium bisulfite.
- If no further reaction occurs (as indicated by a rise in temperature) cautiously add more acid.

SECTION 14 TRANSPORT INFORMATION

Labels Required

- Marine Pollutant
- HAZCHEM 1Y

Land transport (ADG)

<table>
<thead>
<tr>
<th>UN number</th>
<th>AMMONIUM DICHROMATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>1439</td>
</tr>
<tr>
<td>UN proper shipping name</td>
<td>AMMONIUM DICHROMATE</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>Class 5.1</td>
</tr>
<tr>
<td></td>
<td>Subrisk Not Applicable</td>
</tr>
<tr>
<td>Packing group II</td>
<td></td>
</tr>
<tr>
<td>Environmental hazard</td>
<td>Environmentally hazardous</td>
</tr>
</tbody>
</table>

Special precautions for user

- Special provisions: Not Applicable
- Limited quantity: 1 kg

Air transport (ICAO-IATA / DGR)

<table>
<thead>
<tr>
<th>UN number</th>
<th>1439</th>
</tr>
</thead>
</table>
### AMMONIUM DICHROMATE

**UN proper shipping name**: Ammonium dichromate

**Transport hazard class(es)**
- ICAO/IATA Class: 5.1
- ICAO / IATA Subrisk: Not Applicable
- ERG Code: 5L

**Packing group**: II

**Environmental hazard**: Environmentally hazardous

**Special precautions for user**
- Special provisions: Not Applicable
- Cargo Only Packing Instructions: 562
- Cargo Only Maximum Qty / Pack: 25 kg
- Passenger and Cargo Packing Instructions: 558
- Passenger and Cargo Maximum Qty / Pack: 5 kg
- Passenger and Cargo Limited Quantity Packing Instructions: YS44
- Passenger and Cargo Limited Maximum Qty / Pack: 2.5 kg

**Sea transport (IMDG-Code / GGVSee)**
- **UN number**: 1439
- **Transport hazard class(es)**
  - IMDG Class: 5.1
  - IMDG Subrisk: Not Applicable
- **Packing group**: II
- **Environmental hazard**: Marine Pollutant
- **Special precautions for user**
  - EMS Number: F-H , S-Q
  - Special provisions: Not Applicable
  - Limited Quantities: 1 kg

**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**

**AMMONIUM DICHROMATE IS FOUND ON THE FOLLOWING REGULATORY LISTS**
- Australia Dangerous Goods Code (ADG Code) - Dangerous Goods List
- Australia Dangerous Goods Code (ADG Code) - List of Emergency Action Codes
- Australia Exposure Standards
- Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
- Australia Inventory of Chemical Substances (AICS)
- Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
- International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
- International Air Transport Association (IATA) Dangerous Goods Regulations
- International Maritime Dangerous Goods Requirements (IMDG Code)
- United Nations Recommendations on the Transport of Dangerous Goods Model Regulations

**National Inventory Status**

<table>
<thead>
<tr>
<th>National Inventory</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia - AICS</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada - DSL</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada - NDSL</td>
<td>No (ammonium dichromate)</td>
</tr>
<tr>
<td>China - IECSC</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe - EINEC / ELINCS / NLP</td>
<td>Yes</td>
</tr>
<tr>
<td>Japan - ENCS</td>
<td>Yes</td>
</tr>
<tr>
<td>Korea - KECI</td>
<td>Yes</td>
</tr>
<tr>
<td>New Zealand - NZIoC</td>
<td>Yes</td>
</tr>
<tr>
<td>Philippines - PICCS</td>
<td>Yes</td>
</tr>
<tr>
<td>USA - TSCA</td>
<td>Yes</td>
</tr>
<tr>
<td>Taiwan - TCSI</td>
<td>Yes</td>
</tr>
<tr>
<td>Mexico - INSQ</td>
<td>Yes</td>
</tr>
<tr>
<td>Vietnam - NCI</td>
<td>Yes</td>
</tr>
<tr>
<td>Russia - ARIPS</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*Legend:*
- Yes = All CAS declared ingredients are on the inventory
- 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)

Continued...
### 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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