# CHROMIUM TRIOXIDE (CHROMIC ACID)

## ALPHA CHEMICALS PTY LTD

Chemwatch Hazard Alert Code: 4

Chemwatch: **1463**
Version No: **11.1**
Safety Data Sheet according to WHS Regulations (Hazardous Chemicals) Amendment 2020 and ADG requirements

Issue Date: **23/12/2022**
Print Date: **18/01/2024**
S.GHS.AUS.EN

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

### Product Identifier

| | |
|---|---|
| **Product name** | CHROMIUM TRIOXIDE (CHROMIC ACID) |
| **Chemical Name** | Not Available |
| **Synonyms** | Cr-O3; chromic acid anhydride; chromic anhydride; chromium (6+) trioxide; chromium(VI) oxide; monochromium oxide; chromic(VI) acid; chromic acid; chromic acid (flakes); chromic acid flake; chromic acid crystals; British Chrome; APS; AR000000157; UL00000518; TECH00001333; 76638; 65623; 77560; 132333; commercially called chromic acid; Chromium(VI) oxide Prod. Code 27762; chromium trioxide |
| **Proper shipping name** | CHROMIUM TRIOXIDE, ANHYDROUS |
| **Chemical formula** | CrO3 |
| **Other means of identification** | Not Available |
| **CAS number** | 1333-82-0 |

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

| | |
|---|---|
| **Relevant identified uses** | Chromium plating; copper stripping; aluminium anodizing; corrosion inhibitor; photography; lithography; textile printing; tanning and dyeing.<br>Manufacture of dyes, pigments, electric cells, explosives, matches. [~Intermediate ~] |

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

| | |
|---|---|
| **Registered company name** | **ALPHA CHEMICALS PTY LTD** |
| **Address** | 4 ALLEN PLACE WETHERILL PARK NSW 2164 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** | **CHEMWATCH EMERGENCY RESPONSE (24/7)** |
| **Emergency telephone numbers** | 61 (0)418 237 771 | +61 1800 951 288 |
| **Other emergency telephone numbers** | Not Available | +61 3 9573 3188 |

**Once connected and if the message is not in your preferred language then please dial 01**

## 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 | 4 | | |
| Body Contact | 4 | | |
| Reactivity | 2 | | |
| Chronic | 4 | | |

0 = Minimum
1 = Low
2 = Moderate
3 = High
4 = Extreme

| | |
|---|---|
| **Poisons Schedule** | S6 |
| **Classification [1]** | Oxidizing Solids Category 1, Acute Toxicity (Oral) Category 3, Acute Toxicity (Dermal) Category 3, Skin Corrosion/Irritation Category 1A, Sensitisation (Skin) Category 1, Serious Eye Damage/Eye Irritation Category 1, Acute Toxicity (Inhalation) Category 1, Sensitisation (Respiratory) Category 1, Germ Cell Mutagenicity Category 1A, Carcinogenicity Category 1A, Reproductive Toxicity Category 2, Specific Target Organ Toxicity - Repeated Exposure Category 1, Hazardous to the Aquatic Environment Long-Term Hazard Category 1 |
| ***Legend:*** | *1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI* |

### Label elements

| | |
|---|---|
| **Hazard pictogram(s)** |  |
| **Signal word** | **Danger** |

### Hazard statement(s)

| | |
|---|---|
| **H271** | May cause fire or explosion; strong oxidiser. |
| **H301** | Toxic if swallowed. |
| **H311** | Toxic in contact with skin. |
| **H314** | Causes severe skin burns and eye damage. |
| **H317** | May cause an allergic skin reaction. |
| **H330** | Fatal if inhaled. |
| **H334** | May cause allergy or asthma symptoms or breathing difficulties if inhaled. |
| **H340** | May cause genetic defects. |
| **H350** | May cause cancer. |
| **H361f** | Suspected of damaging fertility. |
| **H372** | Causes damage to organs through prolonged or repeated exposure. |
| **H410** | Very toxic to aquatic life with long lasting effects. |

### Precautionary statement(s) Prevention

| | |
|---|---|
| **P201** | Obtain special instructions before use. |
| **P210** | Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. |
| **P260** | Do not breathe dust/fume. |
| **P264** | Wash all exposed external body areas thoroughly after handling. |
| **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 and face protection. |
| **P284** | [In case of inadequate ventilation] wear respiratory protection. |

### Precautionary statement(s) Response

| | |
|---|---|
| **P301+P310** | IF SWALLOWED: Immediately call a POISON CENTER/doctor/physician/first aider. |
| **P301+P330+P331** | IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. If more than 15 mins from Doctor, INDUCE VOMITING (if conscious). |
| **P303+P361+P353** | IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]. |
| **P304+P340** | IF INHALED: Remove person to fresh air and keep 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. |
| **P342+P311** | If experiencing respiratory symptoms: Call a POISON CENTER/doctor/physician/first aider. |
| **P370+P378** | In case of fire: Use water jets to extinguish. |

### Precautionary statement(s) Storage

| | |
|---|---|
| **P403+P233** | Store in a well-ventilated place. Keep container tightly closed. |
| **P405** | Store locked up. |
| **P420** | Store separately. |

### Precautionary statement(s) 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

| CAS No | %[weight] | Name |
|---|---|---|
| 1333-82-0 | >=99.8 | Chromium trioxide (chromic acid) |

***Legend:*** *1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 4. Classification drawn from C&L; * EU IOELVs available*

### Mixtures

See section above for composition of Substances

**Continued...**

## SECTION 4 First aid measures

### Description of first aid measures

| | |
|---|---|
| **Eye Contact** | If this product comes in contact with the eyes:<br>- Immediately hold eyelids apart and flush the eye continuously with running water.<br>- 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.<br>- Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.<br>- Transport to hospital or doctor without delay.<br>- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel. |
| **Skin Contact** | If skin or hair contact occurs:<br>- Immediately flush body and clothes with large amounts of water, using safety shower if available.<br>- Quickly remove all contaminated clothing, including footwear.<br>- Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.<br>- Transport to hospital, or doctor. |
| **Inhalation** | - If fumes or combustion products are inhaled remove from contaminated area.<br>- Lay patient down. Keep warm and rested.<br>- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.<br>- 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.<br>- Transport to hospital, or doctor, without delay.<br>- Inhalation of vapours or aerosols (mists, fumes) may cause lung oedema.<br>- Corrosive substances may cause lung damage (e.g. lung oedema, fluid in the lungs).<br>- As this reaction may be delayed up to 24 hours after exposure, affected individuals need complete rest (preferably in semi-recumbent posture) and must be kept under medical observation even if no symptoms are (yet) manifested.<br>- Before any such manifestation, the administration of a spray containing a dexamethasone derivative or beclomethasone derivative may be considered.<br>**This must definitely be left to a doctor or person authorised by him/her.**<br>(ICSC13719) |
| **Ingestion** | - For advice, contact a Poisons Information Centre or a doctor at once.<br>- Urgent hospital treatment is likely to be needed.<br>- If swallowed do **NOT** induce vomiting.<br>- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.<br>- Observe the patient carefully.<br>- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.<br>- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.<br>- Transport to hospital or doctor without delay. |

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

For acute or short term repeated exposures to dichromates and chromates:
- Absorption occurs from the alimentary tract and lungs.
- The kidney excretes about 60% of absorbed chromate within 8 hours of ingestion. Urinary excretion may take up to 14 days.
- Establish airway, breathing and circulation. Assist ventilation.
- Induce emesis with Ipecac Syrup if patient is not convulsing, in coma or obtunded and if the gag reflex is present.
- Otherwise use gastric lavage with endotracheal intubation.
- Fluid balance is critical. Peritoneal dialysis, haemodialysis or exchange transfusion may be effective although available data is limited.
- British Anti-Lewisite, ascorbic acid, folic acid and EDTA are probably not effective.
- There are no antidotes.
- Primary irritation, including chrome ulceration, may be treated with ointments comprising calcium-sodium-EDTA. This, together with the use of frequently renewed dressings, will ensure rapid healing of any ulcer which may develop.

The mechanism of action involves the reduction of Cr (VI) to Cr(III) and subsequent chelation; the irritant effect of Cr(III)/ protein complexes is thus avoided. [ILO Encyclopedia]

[Ellenhorn and Barceloux: Medical Toxicology]
· Acute chronic acid ingestion causes acute gastroenteritis, hepatic necrosis, bleeding and acute tubular necrosis with renal failure. The efficacy of British Anti-Lewisite haemodialysis and exchange transfusion has not been established.
· Primary irritation, including chrome ulceration, may be treated with ointments comprising calcium-sodium-EDTA. This, together with the use of frequently renewed dressings, will ensure rapid healing of any ulcer which may develop. The mechanism of action involves the reduction of Cr (VI) or Cr (III) and subsequent chelation; the irritant effect of Cr (III) / protein complexes is thus avoided.
[ILO Encyclopedia]
· Massive overexposure to chromic acid could lead to kidney failure and death. Death has been avoided in several such cases through the use of early renal dialysis. It has been reported that there is little value from chelating agents, however, ascorbic acid administered intravenously is an effective antidote in preventing renal failure. Skin ulcers may be treated by removal from exposure, daily cleaning and debridement and application of antibiotic cream and dressing.
BIOLOGICAL EXPOSURE INDEX - BEI
These represent the determinants observed in specimens collected from a healthy worker exposed at the Exposure Standard (ES or TLV):

| Determinant | Sampling time | Index | Comments |
|---|---|---|---|
| Total chromium in urine | Increase during shift | (10ug/g creatinine) | (B) |
| " | End of shift at end of workweek | (30ug/g creatinine) | (B) |

B: Background levels occur in specimens collected from subjects NOT exposed
Depending on the degree of exposure, periodic medical examination is indicated. The symptoms of lung oedema often do not manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation is therefore essential. Immediate administration of an appropriate spray, by a doctor or a person authorised by him/her should be considered.
(ICSC24419/24421

## SECTION 5 Firefighting measures

### Extinguishing media

Continued...

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

| | |
|---|---|
| **Fire Incompatibility** | Can produce intense heat and toxic fumes.<br>- Avoid storage with reducing agents.<br>- Avoid any contamination of this material as it is very reactive and any contamination is potentially hazardous |

### Advice for firefighters

| | |
|---|---|
| **Fire Fighting** | - Alert Fire Brigade and tell them location and nature of hazard.<br>- May be violently or explosively reactive.<br>- Wear full body protective clothing with breathing apparatus.<br>- Prevent, by any means available, spillage from entering drains or water courses.<br>- Fight fire from a safe distance, with adequate cover.<br>- Extinguishers should be used only by trained personnel.<br>- Use water delivered as a fine spray to control fire and cool adjacent area.<br>- **DO NOT** approach containers suspected to be hot. |
| **Fire/Explosion Hazard** | Decomposes at approx 200 deg C. liberating oxygen gas.<br>- Will not burn but increases intensity of fire.<br>- Heating may cause expansion or decomposition leading to violent rupture of containers.<br>- Heat affected containers remain hazardous.<br>- Contact with combustibles such as wood, paper, oil or finely divided metal may produce spontaneous combustion or violent decomposition.<br>- May emit irritating, poisonous or corrosive fumes.<br>Decomposition may produce toxic fumes of:<br>metal oxides |
| **HAZCHEM** | 1W |

## 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

| | |
|---|---|
| **Minor Spills** | - Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material.<br>- Check regularly for spills and leaks.<br>- Clean up all spills immediately.<br>- No smoking, naked lights, ignition sources.<br>- Avoid all contact with any organic matter including fuel, solvents, sawdust, paper or cloth and other incompatible materials, as ignition may result.<br>- Avoid breathing dust or vapours and all contact with skin and eyes.<br>- Control personal contact with the substance, by using protective equipment.<br>- Contain and absorb spill with dry sand, earth, inert material or vermiculite.<br>- **DO NOT** use sawdust as fire may result.<br>- Scoop up solid residues and seal in labelled drums for disposal. |
| **Major Spills** | - Clear area of personnel and move upwind.<br>- Alert Fire Brigade and tell them location and nature of hazard.<br>- May be violently or explosively reactive.<br>- Wear full body protective clothing with breathing apparatus.<br>- Prevent, by any means available, spillage from entering drains or water courses.<br>- No smoking, flames or ignition sources.<br>- Increase ventilation.<br>- Contain spill with sand, earth or other clean, inert materials. |

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

## SECTION 7 Handling and storage

### Precautions for safe handling

| | |
|---|---|
| **Safe handling** | For oxidisers, including peroxides.<br>· Avoid personal contact and inhalation of dust, mist or vapours.<br>· Provide adequate ventilation.<br>· Always wear protective equipment and wash off any spillage from clothing.<br>· Keep material away from light, heat, flammables or combustibles.<br>· Keep cool, dry and away from incompatible materials.<br>· Avoid physical damage to containers.<br>· **DO NOT** repack or return unused portions to original containers. |
| **Other information** | - Store in original containers.<br>- Keep containers securely sealed as supplied.<br>- Store in a cool, well ventilated area.<br>- Keep dry.<br>- Store under cover and away from sunlight.<br>- Store away from flammable or combustible materials, debris and waste. Contact may cause fire or violent reaction. |

**Continued...**

| | |
|---|---|
| | - Store away from incompatible materials and foodstuff containers.<br>In addition, Goods of Class 5.1, packing group II should be:<br>- stored in piles so that<br>- the height of the pile does not exceed 1 metre<br>- the maximum quantity in a pile or building does not exceed 1000 tonnes unless the area is provided with automatic fire extinguishers<br>- 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.<br>- 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.<br>- the minimum distance to walls is not less than 1 metre. |

### Conditions for safe storage, including any incompatibilities

| | |
|---|---|
| **Suitable container** | - Glass container is suitable for laboratory quantities<br>- **DO NOT** use aluminium, galvanised or tin-plated containers<br>- **DO NOT** repack. Use containers supplied by manufacturer only.<br>For low viscosity materials<br>- Drums and jerricans must be of the non-removable head type.<br>- Where a can is to be used as an inner package, the can must have a screwed enclosure.<br>For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids:<br>- Removable head packaging and<br>- cans with friction closures may be used.<br>-<br>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 *.<br>-<br>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 *.<br>-<br>* unless the outer packaging is a close fitting moulded plastic box and the substances are not incompatible with the plastic. |
| **Storage incompatibility** | - WARNING: 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.<br>- 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.<br>- Avoid reaction with borohydrides or cyanoborohydrides<br>- 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.<br>- Inorganic peroxy compounds are potent oxidisers that pose fire or explosive hazards when in contact with ordinary combustible materials.<br>- Inorganic peroxides react with organic compounds to generate organic peroxide and hydroperoxide products that react violently with reducing agents.<br>- Inorganic oxidising agents 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).<br>- 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.<br>- Inorganic oxidising agents can react violently with active metals, cyanides, esters, and thiocyanates.<br>- 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.<br>- Metals and their oxides or salts may react violently with chlorine trifluoride and bromine trifluoride.<br>- 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.<br>- The state of subdivision may affect the results.<br>44redret |

## SECTION 8 Exposure controls / personal protection

### Control parameters

#### Occupational Exposure Limits (OEL)

#### INGREDIENT DATA

| Source | Ingredient | Material name | TWA | STEL | Peak | Notes |
|---|---|---|---|---|---|---|
| Australia Exposure Standards | Chromium trioxide (chromic acid) | Chromium (VI) compounds (as Cr), water soluble | 0.05 mg/m3 | Not Available | Not Available | Not Available |

#### Emergency Limits

| Ingredient | TEEL-1 | TEEL-2 | TEEL-3 |
|---|---|---|---|
| Chromium trioxide (chromic acid) | 0.29 mg/m3 | 5 mg/m3 | 30 mg/m3 |

| Ingredient | Original IDLH | Revised IDLH |
|---|---|---|
| Chromium trioxide (chromic acid) | 15 mg/m3 | Not Available |

### 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.<br>The basic types of engineering controls are:<br>Process controls which involve changing the way a job activity or process is done to reduce the risk.<br>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.<br>Employers may need to use multiple types of controls to prevent employee overexposure.<br>- Employees exposed to confirmed human carcinogens should be authorized to do so by the employer, and work in a regulated area. |

Continued...

| | |
|---|---|
| **Individual protection measures, such as personal protective equipment** | |
| **Eye and face protection** | ‣ Safety glasses with unperforated side shields may be used where continuous eye protection is desirable, as in laboratories; spectacles are not sufficient where complete eye protection is needed such as when handling bulk-quantities, where there is a danger of splashing, or if the material may be under pressure.<br>‣ Chemical goggles. Whenever there is a danger of the material coming in contact with the eyes; goggles must be properly fitted. [AS/NZS 1337.1, EN166 or national equivalent]<br>‣ Full face shield (20 cm, 8 in minimum) may be required for supplementary but never for primary protection of eyes; these afford face protection.<br>‣ Alternatively a gas mask may replace splash goggles and face shields.<br>‣ 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. |
| **Skin protection** | See Hand protection below |
| **Hands/feet protection** | ‣ Elbow length PVC gloves<br>**NOTE:**<br>‣ 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.<br>‣ Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed.<br>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.<br>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.<br>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.<br>Suitability and durability of glove type is dependent on usage.<br>‣ **DO NOT** wear cotton or cotton-backed gloves.<br>‣ **DO NOT** wear leather gloves.<br>‣ 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 |
| **Other protection** | ‣ Employees working with confirmed human carcinogens should be provided with, and be required to wear, clean, full body protective clothing (smocks, coveralls, or long-sleeved shirt and pants), shoe covers and gloves prior to entering the regulated area. [AS/NZS ISO 6529:2006 or national equivalent]<br>‣ Employees engaged in handling operations involving carcinogens should be provided with, and required to wear and use half-face filter-type respirators with filters for dusts, mists and fumes, or air purifying canisters or cartridges. A respirator affording higher levels of protection may be substituted. [AS/NZS 1715 or national equivalent]<br>‣ Emergency deluge showers and eyewash fountains, supplied with potable water, should be located near, within sight of, and on the same level with locations where direct exposure is likely.<br>‣ Prior to each exit from an area containing confirmed human carcinogens, employees should be required to remove and leave protective clothing and equipment at the point of exit and at the last exit of the day, to place used clothing and equipment in impervious containers at the point of exit for purposes of decontamination or disposal. The contents of such impervious containers must be identified with suitable labels. For maintenance and decontamination activities, authorized employees entering the area should be provided with and required to wear clean, impervious garments, including gloves, boots and continuous-air supplied hood.<br>‣ Prior to removing protective garments the employee should undergo decontamination and be required to shower upon removal of the garments and hood.<br>‣ Overalls.<br>‣ PVC Apron.<br>‣ PVC protective suit may be required if exposure severe.<br>‣ Eyewash unit.<br>‣ Ensure there is ready access to a safety shower.<br>‣ Some plastic personal protective equipment (PPE) (e.g. gloves, aprons, overshoes) are not recommended as they may produce static electricity.<br>‣ For large scale or continuous use wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets).<br>‣ Non sparking safety or conductive footwear should be considered. Conductive footwear describes a boot or shoe with a sole made from a conductive compound chemically bound to the bottom components, for permanent control to electrically ground the foot an shall dissipate static electricity from the body to reduce the possibility of ignition of volatile compounds. Electrical resistance must range between 0 to 500,000 ohms. Conductive shoes should be stored in lockers close to the room in which they are worn. Personnel who have been issued conductive footwear should not wear them from their place of work to their homes and return. |

### Recommended material(s)

**GLOVE SELECTION INDEX**

Glove selection is based on a modified presentation of the:
***"Forsberg Clothing Performance Index".***
The effect(s) of the following substance(s) are taken into account in the ***computer-generated*** selection:
CHROMIUM TRIOXIDE (CHROMIC ACID)

| **Material** | **CPI** |
|---|---|
| BUTYL | A |
| NATURAL RUBBER | A |
| NITRILE+PVC | A |
| PVC | A |
| NITRILE | B |

* CPI - Chemwatch Performance Index
A: Best Selection
B: Satisfactory; may degrade after 4 hours continuous immersion

### Respiratory protection

Type -P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

| **Required Minimum Protection Factor** | **Half-Face Respirator** | **Full-Face Respirator** | **Powered Air Respirator** |
|---|---|---|---|
| up to 10 x ES | P1<br>Air-line* | -<br>- | PAPR-P1<br>- |
| up to 50 x ES | Air-line** | P2 | PAPR-P2 |
| up to 100 x ES | - | P3 | - |
| | | Air-line* | - |
| 100+ x ES | - | Air-line** | PAPR-P3 |

* - Negative pressure demand ** - Continuous flow
A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic

**Continued...**

C: Poor to Dangerous Choice for other than short term immersion
**NOTE**: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -
* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

### Ansell Glove Selection

| **Glove** — *In order of recommendation* |
|---|
| AlphaTec 02-100 |
| AlphaTec® 15-554 |
| AlphaTec® Solvex® 37-185 |
| AlphaTec® 38-612 |
| AlphaTec® 58-008 |
| AlphaTec® 58-530B |
| AlphaTec® 58-530W |
| AlphaTec® 58-735 |
| AlphaTec® 79-700 |
| AlphaTec® Solvex® 37-675 |

*The suggested gloves for use should be confirmed with the glove supplier.*

compounds(below 65 degC)

· 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.
· Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU)
· 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

| | |
|---|---|
| **Appearance** | Dark red odourless crystals or flakes; highly corrosive. Absorbs water from air. Very soluble in water forming a very corrosive solution. Soluble in sulphuric acid. A strong oxidising agent. Decomposes at approx 200 deg C. liberating oxygen gas. |

| | | | |
|---|---|---|---|
| **Physical state** | Divided Solid | **Relative density (Water = 1)** | 2.7 (1.0 Bulk D) |
| **Odour** | Not Available | **Partition coefficient n-octanol / water** | Not Available |
| **Odour threshold** | Not Available | **Auto-ignition temperature (°C)** | Not Applicable |
| **pH (as supplied)** | Not Applicable | **Decomposition temperature (°C)** | 200~ |
| **Melting point / freezing point (°C)** | 197 | **Viscosity (cSt)** | Not Applicable |
| **Initial boiling point and boiling range (°C)** | Not Applicable | **Molecular weight (g/mol)** | 100.0 |
| **Flash point (°C)** | Not Applicable | **Taste** | Not Available |
| **Evaporation rate** | Non Volatile | **Explosive properties** | Not Available |
| **Flammability** | Not Applicable | **Oxidising properties** | Not Available |
| **Upper Explosive Limit (%)** | Not Available | **Surface Tension (dyn/cm or mN/m)** | Not Applicable |
| **Lower Explosive Limit (%)** | Not Available | **Volatile Component (%vol)** | Nil @ 38 C. |
| **Vapour pressure (kPa)** | Not Applicable | **Gas group** | Not Available |
| **Solubility in water** | Miscible | **pH as a solution (1%)** | < 1 @ 10% |
| **Vapour density (Air = 1)** | Not Applicable | **VOC g/L** | Not Available |

## SECTION 10 Stability and reactivity

| | |
|---|---|
| **Reactivity** | See section 7 |
| **Chemical stability** | ▸ Unstable in the presence of incompatible materials.<br>▸ Product is considered stable under normal handling conditions.<br>▸ Prolonged exposure to heat.<br>▸ Hazardous polymerisation will not occur. |
| **Possibility of hazardous reactions** | See section 7 |
| **Conditions to avoid** | See section 7 |
| **Incompatible materials** | See section 7 |
| **Hazardous decomposition products** | See section 5 |

## 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.<br>The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage. |

**Continued...**

| | |
|---|---|
| | 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.<br>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.<br>Chrome fume is irritating to the respiratory tract and lungs. Exposure to chromium at certain oxidation levels (eg. 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.<br>Inhalation of chromium fumes may cause metal fume fever' characterised by flu-like symptoms, fever, chill, nausea, weakness and body aches.<br>Toxic effects result from over-exposure. Asthmatic conditions may result as a consequence of the sensitising action of chrome VI compounds. |
| **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.<br>The material can produce severe chemical burns within the oral cavity and gastrointestinal tract following ingestion.<br>Symptoms of exposure may be delayed.<br>Chromate salts are corrosive and produce cellular damage to tissue. Ingestion may produce inflammation of the digestive tract, nausea, vomiting and abdominal pain. |
| **Skin Contact** | Skin contact with the material may produce toxic effects; systemic effects may result following absorption.<br>The material can produce severe chemical burns following direct contact with the skin.<br>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 sensitiser, 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.<br>Open cuts, abraded or irritated skin should not be exposed to this material<br>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. |
| **Eye** | The material can produce severe chemical burns to the eye following direct contact. Vapours or mists may be extremely irritating.<br>If applied to the eyes, this material causes severe eye damage. |
| **Chronic** | Long-term exposure to respiratory irritants may result in airways disease, involving difficulty breathing and related whole-body problems.<br>Inhaling this product is more likely to cause a sensitisation reaction in some persons compared to the general population.<br>Skin contact with the material is more likely to cause a sensitisation reaction in some persons compared to the general population.<br>There is sufficient evidence to suggest that this material directly causes cancer in humans.<br>Toxic: danger of serious damage to health by prolonged exposure through inhalation.<br>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.<br>Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.<br>Chronic inhalation exposure may result in nasal ulceration and/or perforation of nasal septum.<br>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.<br>Sensitisation may give severe responses to very low levels of exposure, i.e. hypersensitivity.<br>Repeated or prolonged exposure to acids may result in the erosion of teeth, swelling and/or ulceration of mouth lining. Irritation of airways to lung, with cough, and inflammation of lung tissue often occurs. |

**Chromium trioxide (chromic acid)**

| TOXICITY | IRRITATION |
|---|---|
| Dermal (rabbit) LD50: 57 mg/kg[1] | Skin (human): corrosive |
| Inhalation(Rat) LC50: 0.083 mg/L4h[1] | |
| Oral (Rat) LD50: 52 mg/kg[1] | |

| | |
|---|---|
| ***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* |

| | |
|---|---|
| **CHROMIUM TRIOXIDE (CHROMIC ACID)** | 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>Asthma-like symptoms may continue for months or even years after exposure to the material ends. 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.<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.<br><br>**WARNING:** This substance has been classified by the IARC as Group 1: **CARCINOGENIC TO HUMANS**. |

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

**Continued...**

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

## SECTION 12 Ecological information

### Toxicity

| | Endpoint | Test Duration (hr) | Species | Value | Source |
|---|---|---|---|---|---|
| **Chromium trioxide (chromic acid)** | BCF | 1008h | Fish | 4.6-15 | 7 |
| | EC50 | 72h | Algae or other aquatic plants | 0.38mg/l | 2 |
| | EC50 | 96h | Algae or other aquatic plants | 0.71mg/L | 4 |
| | LC50 | 96h | Fish | 13mg/l | 2 |
| | NOEC(ECx) | 72h | Crustacea | 0.005mg/l | 4 |
| ***Legend:*** | *Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 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* | | | | |

Log Pow: Not relevant
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 chromate 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 intramedia 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.
**DO NOT** discharge into sewer or waterways.

### Persistence and degradability

| Ingredient | Persistence: Water/Soil | Persistence: Air |
|---|---|---|
| | No Data available for all ingredients | No Data available for all ingredients |

### Bioaccumulative potential

| Ingredient | Bioaccumulation |
|---|---|
| Chromium trioxide (chromic acid) | LOW (BCF = 21) |

### Mobility in soil

| Ingredient | Mobility |
|---|---|
| | No Data available for all ingredients |

## SECTION 13 Disposal considerations

### Waste treatment methods

**Product / Packaging disposal**

- 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)

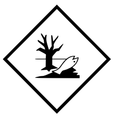
This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate. In most instances the supplier of the material should be consulted.

**Continued...**

- **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.
- Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.
- Treat and neutralise at an approved treatment plant. Treatment should involve: Mixing or slurrying in water; Neutralisation followed by: burial in a land-fill specifically licensed to accept chemical and / or pharmaceutical wastes or Incineration in a licensed apparatus (after admixture with suitable combustible material)
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

## SECTION 14 Transport information

### Labels Required

| | |
|---|---|
| |  |
| **Marine Pollutant** |  |
| **HAZCHEM** | 1W |

### Land transport (ADG)

| | | |
|---|---|---|
| 14.1. **UN number or ID number** | 1463 | |
| 14.2. **UN proper shipping name** | CHROMIUM TRIOXIDE, ANHYDROUS | |
| 14.3. **Transport hazard class(es)** | Class | 5.1 |
| | Subsidiary Hazard | 6.1, 8 |
| 14.4. **Packing group** | II | |
| 14.5. **Environmental hazard** | Environmentally hazardous | |
| 14.6. **Special precautions for user** | Special provisions | Not Applicable |
| | Limited quantity | 1 kg |

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

| | | |
|---|---|---|
| 14.1. **UN number** | 1463 | |
| 14.2. **UN proper shipping name** | Chromium trioxide, anhydrous | |
| 14.3. **Transport hazard class(es)** | ICAO/IATA Class | 5.1 |
| | ICAO / IATA Subsidiary Hazard | 6.1, 8 |
| | ERG Code | 5CP |
| 14.4. **Packing group** | II | |
| 14.5. **Environmental hazard** | Environmentally hazardous | |
| 14.6. **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 | Y544 |
| | Passenger and Cargo Limited Maximum Qty / Pack | 2.5 kg |

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

| | | |
|---|---|---|
| 14.1. **UN number** | 1463 | |
| 14.2. **UN proper shipping name** | CHROMIUM TRIOXIDE, ANHYDROUS | |
| 14.3. **Transport hazard class(es)** | IMDG Class | 5.1 |
| | IMDG Subsidiary Hazard | 6.1, 8 |

**Continued...**

| | |
|---|---|
| 14.4. **Packing group** | II |
| 14.5 **Environmental hazard** | Marine Pollutant |
| 14.6. **Special precautions for user** | EMS Number: F-A , S-Q<br>Special provisions: Not Applicable<br>Limited Quantities: 1 kg |

### 14.7.1. Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

### 14.7.2. Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

| Product name | Group |
|---|---|
| Chromium trioxide (chromic acid) | Not Available |

### 14.7.3. Transport in bulk in accordance with the IGC Code

| Product name | Ship Type |
|---|---|
| Chromium trioxide (chromic acid) | Not Available |

## SECTION 15 Regulatory information

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

**Chromium trioxide (chromic acid) is found on the following regulatory lists**

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Model Work Health and Safety Regulations - Hazardous chemicals (other than lead) requiring health monitoring
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
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 1: Carcinogenic to humans

### Additional Regulatory Information

Not Applicable

### National Inventory Status

| National Inventory | Status |
|---|---|
| Australia - AIIC / Australia Non-Industrial Use | Yes |
| Canada - DSL | Yes |
| Canada - NDSL | No (Chromium trioxide (chromic acid)) |
| 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 - FBEPH | Yes |
| ***Legend:*** | *Yes = All CAS declared ingredients are on the inventory*<br>*No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.* |

## SECTION 16 Other information

| | |
|---|---|
| **Revision Date** | 23/12/2022 |
| **Initial Date** | 04/02/2002 |

### SDS Version Summary

| Version | Date of Update | Sections Updated |
|---|---|---|
| 10.1 | 13/03/2019 | Expiration. Review and Update |
| 11.1 | 23/12/2022 | Classification review due to GHS Revision change. |

**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
- ES: Exposure Standard
- 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
- DNEL: Derived No-Effect Level
- PNEC: Predicted no-effect concentration

- AIIC: Australian Inventory of Industrial Chemicals
- DSL: Domestic Substances List
- NDSL: Non-Domestic Substances List
- IECSC: Inventory of Existing Chemical Substance in China
- EINECS: European INventory of Existing Commercial chemical Substances
- ELINCS: European List of Notified Chemical Substances
- NLP: No-Longer Polymers
- ENCS: Existing and New Chemical Substances Inventory
- KECI: Korea Existing Chemicals Inventory
- NZIoC: New Zealand Inventory of Chemicals
- PICCS: Philippine Inventory of Chemicals and Chemical Substances
- TSCA: Toxic Substances Control Act
- TCSI: Taiwan Chemical Substance Inventory
- INSQ: Inventario Nacional de Sustancias Químicas
- NCI: National Chemical Inventory
- FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances