ICP multi-element standard solution IV

Novachem Pty Ltd

Chemwatch Hazard Alert Code: **4**

Version No: **1.1**
Safety Data Sheet according to WHS Regulations (Hazardous Chemicals) Amendment 2020 and ADG requirements

Issue Date: **14/05/2023**
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SECTION 1 Identification of the substance / mixture and of the company / undertaking

Product Identifier

Product name	ICP multi-element standard solution IV
Synonyms	Not Available
Proper shipping name	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Nitric acid solution)
Other means of identification	MES-04-1

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

Relevant identified uses	Laboratory Chemical Reference Material

Details of the manufacturer or supplier of the safety data sheet

Registered company name	**Novachem Pty Ltd**	**Novachem Pty Ltd**
Address	25 Crissane Road, Heidelberg West Victoria 3081 Australia	25 Crissane Road, Heidelberg West Victoria 3081 Australia
Telephone	+61384151255	+61384151255
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Website	www.novachem.com.au	www.novachem.com.au
Email	novachem@novachem.com.au	novachem@novachem.com.au

Emergency telephone number

Association / Organisation	**Victorian Poisons Information Centre**	**Victorian Poisons Information Centre**
Emergency telephone numbers	13 11 26	13 11 26
Other emergency telephone numbers	Not Available	Not Available

SECTION 2 Hazards identification

Classification of the substance or mixture

Poisons Schedule	Not Applicable
Classification [1]	Germ Cell Mutagenicity Category 1A, Corrosive to Metals Category 1, Serious Eye Damage/Eye Irritation Category 1, Acute Toxicity (Oral) Category 4, Carcinogenicity Category 1A, Reproductive Toxicity Category 1B, Acute Toxicity (Inhalation) Category 2, Skin Corrosion/Irritation Category 1A, Hazardous to the Aquatic Environment Long-Term Hazard Category 3
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)

H340	May cause genetic defects.
H290	May be corrosive to metals.
H302	Harmful if swallowed.
H350	May cause cancer.
H360FD	May damage fertility. May damage the unborn child.

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H330	Fatal if inhaled.
H314	Causes severe skin burns and eye damage.
H412	Harmful to aquatic life with long lasting effects.

Precautionary statement(s) Prevention

P201	Obtain special instructions before use.
P260	Do not breathe mist/vapours/spray.
P264	Wash all exposed external body areas thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.

Precautionary statement(s) Response

P301+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
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.

Precautionary statement(s) Storage

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

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

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
7761-88-8	0.158	silver nitrate
7784-27-2	1.39	aluminium nitrate
10043-35-3	0.572	boric acid
10022-31-8	0.19	barium nitrate
7440-69-9	0.1	bismuth
471-34-1	0.25	calcium carbonate
7440-43-9	0.1	cadmium
7440-48-4	0.1	cobalt
7789-09-5	0.242	ammonium dichromate
7440-50-8	0.1	copper
7782-61-8	0.723	ferric nitrate
7440-55-3	0.1	gallium
7440-74-6	0.1	indium
7757-79-1	0.259	potassium nitrate
554-13-2	0.532	lithium carbonate
13446-18-9	1.055	magnesium nitrate
6156-78-1	0.446	manganese(II) acetate tetrahydrate
7631-99-4	0.37	sodium nitrate
7440-02-0	0.1	nickel
10099-74-8	0.16	lead nitrate
10042-76-9	0.242	strontium nitrate
7440-28-0	0.1	thallium
7440-66-6	0.1	zinc
7697-37-2	6.3	nitric acid
7732-18-5	86.211	water
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*	

SECTION 4 First aid measures

Description of first aid measures

Eye Contact	If this product comes in contact with the eyes:

Continued...

	▸ Immediately hold eyelids apart and flush the eye continuously with running water. ▸ 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. ▸ Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. ▸ Transport to hospital or doctor without delay. ▸ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	If skin or hair contact occurs: ▸ Immediately flush body and clothes with large amounts of water, using safety shower if available. ▸ Quickly remove all contaminated clothing, including footwear. ▸ Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre. ▸ Transport to hospital, or doctor. For thermal burns: ▸ Decontaminate area around burn. ▸ Consider the use of cold packs and topical antibiotics. For first-degree burns (affecting top layer of skin) ▸ Hold burned skin under cool (not cold) running water or immerse in cool water until pain subsides. ▸ Use compresses if running water is not available. ▸ Cover with sterile non-adhesive bandage or clean cloth. ▸ Do NOT apply butter or ointments; this may cause infection. ▸ Give over-the counter pain relievers if pain increases or swelling, redness, fever occur. For second-degree burns (affecting top two layers of skin) ▸ Cool the burn by immerse in cold running water for 10-15 minutes. ▸ Use compresses if running water is not available. ▸ Do NOT apply ice as this may lower body temperature and cause further damage. ▸ Do NOT break blisters or apply butter or ointments; this may cause infection. ▸ Protect burn by cover loosely with sterile, nonstick bandage and secure in place with gauze or tape. To prevent shock: (unless the person has a head, neck, or leg injury, or it would cause discomfort): ▸ Lay the person flat. ▸ Elevate feet about 12 inches. ▸ Elevate burn area above heart level, if possible. ▸ Cover the person with coat or blanket. ▸ Seek medical assistance. For third-degree burns Seek immediate medical or emergency assistance. In the mean time: ▸ Protect burn area cover loosely with sterile, nonstick bandage or, for large areas, a sheet or other material that will not leave lint in wound. ▸ Separate burned toes and fingers with dry, sterile dressings. ▸ Do not soak burn in water or apply ointments or butter; this may cause infection. ▸ To prevent shock see above. ▸ For an airway burn, do not place pillow under the person's head when the person is lying down. This can close the airway. ▸ Have a person with a facial burn sit up. ▸ Check pulse and breathing to monitor for shock until emergency help arrives.
Inhalation	▸ If fumes or combustion products are inhaled remove from contaminated area. ▸ Lay patient down. Keep warm and rested. ▸ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. ▸ 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. ▸ Transport to hospital, or doctor, without delay.
Ingestion	▸ For advice, contact a Poisons Information Centre or a doctor at once. ▸ Urgent hospital treatment is likely to be needed. ▸ If swallowed do **NOT** induce vomiting. ▸ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. ▸ Observe the patient carefully. ▸ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious. ▸ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink. ▸ Transport to hospital or doctor without delay.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

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]
The material may induce methaemoglobinaemia following exposure.
- Initial attention should be directed at oxygen delivery and assisted ventilation if necessary. Hyperbaric oxygen has not demonstrated substantial benefits.
- Hypotension should respond to Trendelenburg's position and intravenous fluids; otherwise dopamine may be needed.
- Symptomatic patients with methaemoglobin levels over 30% should receive methylene blue. (Cyanosis, alone, is not an indication for treatment). The usual dose is 1-2 mg/kg of a 1% solution (10 mg/ml) IV over 50 minutes; repeat, using the same dose, if symptoms of hypoxia fail to subside within 1 hour.
- Thorough cleansing of the entire contaminated area of the body, including the scalp and nails, is of utmost importance.

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	Index	Sampling Time	Comment

Continued...

1. Methaemoglobin in blood	1.5% of haemoglobin	During or end of shift	B, NS, SQ

B: Background levels occur in specimens collected from subjects **NOT** exposed
NS: Non-specific determinant; also observed after exposure to other materials
SQ: Semi-quantitative determinant - Interpretation may be ambiguous; should be used as a screening test or confirmatory test.
For acute or short term repeated exposures to strong acids:

- Airway problems may arise from laryngeal edema and inhalation exposure. Treat with 100% oxygen initially.
- Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling
- Intravenous lines should be established immediately in all cases where there is evidence of circulatory compromise.
- Strong acids produce a coagulation necrosis characterised by formation of a coagulum (eschar) as a result of the dessicating action of the acid on proteins in specific tissues.

INGESTION:

- Immediate dilution (milk or water) within 30 minutes post ingestion is recommended.
- **DO NOT** attempt to neutralise the acid since exothermic reaction may extend the corrosive injury.
- Be careful to avoid further vomit since re-exposure of the mucosa to the acid is harmful. Limit fluids to one or two glasses in an adult.
- Charcoal has no place in acid management.
- Some authors suggest the use of lavage within 1 hour of ingestion.

SKIN:

- Skin lesions require copious saline irrigation. Treat chemical burns as thermal burns with non-adherent gauze and wrapping.
- Deep second-degree burns may benefit from topical silver sulfadiazine.

EYE:

- Eye injuries require retraction of the eyelids to ensure thorough irrigation of the conjuctival cul-de-sacs. Irrigation should last at least 20-30 minutes. **DO NOT** use neutralising agents or any other additives. Several litres of saline are required.
- Cycloplegic drops, (1% cyclopentolate for short-term use or 5% homatropine for longer term use) antibiotic drops, vasoconstrictive agents or artificial tears may be indicated dependent on the severity of the injury.
- Steroid eye drops should only be administered with the approval of a consulting ophthalmologist).

[Ellenhorn and Barceloux: Medical Toxicology]

SECTION 5 Firefighting measures

Extinguishing media

- There is no restriction on the type of extinguisher which may be used.
- Use extinguishing media suitable for surrounding area.

Special hazards arising from the substrate or mixture

Fire Incompatibility	None known.

Advice for firefighters

Fire Fighting	- Alert Fire Brigade and tell them location and nature of hazard. - Wear breathing apparatus plus protective gloves in the event of a fire. - Prevent, by any means available, spillage from entering drains or water courses. - Use fire fighting procedures suitable for surrounding area.
Fire/Explosion Hazard	- Non combustible. - Not considered to be a significant fire risk. - Acids may react with metals to produce hydrogen, a highly flammable and explosive gas. - Heating may cause expansion or decomposition leading to violent rupture of containers. Decomposition may produce toxic fumes of: nitrogen oxides (NOx) metal oxides When aluminium oxide dust is dispersed in air, firefighters should wear protection against inhalation of dust particles, which can also contain hazardous substances from the fire absorbed on the alumina particles. May emit poisonous fumes.
HAZCHEM	2X

SECTION 6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	- Clean up all spills immediately. - Avoid breathing vapours and contact with skin and eyes. - Control personal contact with the substance, by using protective equipment. - Contain and absorb spill with sand, earth, inert material or vermiculite.
Major Spills	- Clear area of personnel and move upwind. - Alert Fire Brigade and tell them location and nature of hazard. - Wear full body protective clothing with breathing apparatus. - Prevent, by all means available, spillage from entering drains or water courses.

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

SECTION 7 Handling and storage

Continued...

Precautions for safe handling

Safe handling	‣ Avoid all personal contact, including inhalation. ‣ Wear protective clothing when risk of exposure occurs. ‣ Use in a well-ventilated area. ‣ Prevent concentration in hollows and sumps.
Other information	‣ Store in original containers. ‣ Keep containers securely sealed. ‣ Store in a cool, dry, well-ventilated area. ‣ Store away from incompatible materials and foodstuff containers.

Conditions for safe storage, including any incompatibilities

Suitable container	‣ **DO NOT** use aluminium or galvanised containers ‣ Lined metal can, lined metal pail/ can. ‣ Plastic pail. ‣ Polyliner drum. ‣ Packing as recommended by manufacturer. For low viscosity materials ‣ Drums and jerricans must be of the non-removable head type. ‣ Where a can is to be used as an inner package, the can must have a screwed enclosure. For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids (between 15 C deg. and 40 deg C.): ‣ Removable head packaging; ‣ Cans with friction closures and ‣ low pressure tubes and cartridges may be used. All inner and sole packagings for substances that have been assigned to Packaging Groups I or II on the basis of inhalation toxicity criteria, must be hermetically sealed.
Storage incompatibility	The substance may be or contains a "metalloid" The following elements are considered to be metalloids; boron,silicon, germanium, arsenic, antimony, tellurium and (possibly) polonium The electronegativities and ionisation energies of the metalloids are between those of the metals and nonmetals, so the metalloids exhibit characteristics of both classes. The reactivity of the metalloids depends on the element with which they are reacting. For example, boron acts as a nonmetal when reacting with sodium yet as a metal when reacting with fluorine. Unlike most metals, most metalloids are amphoteric- that is they can act as both an acid and a base. Derivative of electropositive metal. For aluminas (aluminium oxide): Incompatible with hot chlorinated rubber. In the presence of chlorine trifluoride may react violently and ignite. -May initiate explosive polymerisation of olefin oxides including ethylene oxide. -Produces exothermic reaction above 200°C with halocarbons and an exothermic reaction at ambient temperatures with halocarbons in the presence of other metals. Metal nitrites: ‣ are incompatible with chlorates, hypophosphites, iodides, mercury salts, permanganates, sulfites, primary amines and amides, secondary amines and amides, ammonium salts, activated carbon, cyanogen compounds, thiocyanates, thiosulfates, cyanides, sodium amide, boron, acetanilide, antipyrine, tannic acid and cellulose ‣ react explosively with hydrazine and liquid ammonia . ‣ react explosively following fusion with metal cyanides ‣ react (often) with salts of nitrogenous bases to produce an unstable corresponding nitrite salt. Nitric acid: ‣ is a strong acid and oxidiser ‣ reacts with water or steam to form toxic and corrosive nitrous fumes ‣ reacts violently with water when added as the concentrated acid with generation of heat (always add acid to water to dilute) ‣ reacts violently with reducing agents, bases, combustible materials, finely dispersed or powdered metals and metal alloys, acetic anhydride, acetone, acetylene, acrolein, acrylonitrile, alcohols, aliphatic amines, allyl chloride, ammonia, aniline, anionic exchange resins, 1,4-benzoquinone diimine, 1,2-bis(trimethylsilyl)hydrazine, bromine pentafluoride, cresol, crotonaldehyde, cumene, cyanides, diethyl ether, 1,2-dimethyl-2-trimethylsilylhydrazine, diphenyltin, divinyl ether, N-ethylaniline, ethyl phosphine, 2-ethynylfuran, fluorine, halides of phosphorus or sulfur, hydrazine, hydrogen peroxide, germanium, hydrogen iodide, lithium triethylsilyl amide, metal acetylides, 2-methylthiophene, pentanethiol, phosphorus and phosphorus vapours, polyurethane foam, potassium permanganate, resorcinol, rubber (containing lead), sulfides, sulfur, sulfur dioxide, stibine, thiophene, triethylgallium, polydibromosilane, vinyl ether, zinc ethoxide, zinc phosphide, organic solvents and many other substances and ,materials ‣ is incompatible with many substances including acrylates, aldehydes, alkanolamines, alkylene oxides, aromatic amines, amides, cresols, cyclic ketones, epichlorohydrin, glycols, hydrocarbons, isocyanates, ketones, oleum, organic anhydrides, paraldehyde, phenols, silanes, strong oxidisers, substituted allyls, sulfuric acid, terpenes, vinyl acetate, vinylidene chloride ‣ forms heat, impact, friction or shock explosive substances with acetic acid, acetoxyethylene glycol, ammonium nitrate, anilinium nitrate, 1,2-dichloroethane, dichloroethylene, dichloromethane, diethylaminoethanol, 3,6-dihydro-1,2,2H-oxazine, dimethyl ether, dinitrobenzenes, disodium phenyl orthophosphate, 2-hexanal, metal salicylates, 3-methylcyclohexanone, nitroaromatics, nitrobenzenes, nitromethane, beta-propyl acrolein, salicylic acid ‣ increases the explosive sensitivity of nitromethane ‣ may decompose when heated with the formation of nitrogen dioxide (which also produces discolouration - colourless 100% acid cannot be stored in the presence of light with formation of nitrogen dioxide (which cause discolouration) ‣ attacks most metals and some plastics, rubber and coatings ‣ 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. ‣ 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. ‣ Avoid strong bases.

SECTION 8 Exposure controls / personal protection

Control parameters

Continued...

Occupational Exposure Limits (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
Australia Exposure Standards	silver nitrate	Silver, soluble compounds (as Ag)	0.01 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	aluminium nitrate	Aluminium, soluble salts (as Al)	2 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	barium nitrate	Barium, soluble compounds (as Ba)	0.5 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	calcium carbonate	Calcium carbonate	10 mg/m3	Not Available	Not Available	(a) This value is for inhalable dust containing no asbestos and < 1% crystalline silica.
Australia Exposure Standards	cadmium	Cadmium and compounds (as Cd)	0.01 mg/m3	Not Available	Not Available	(g) Some compounds in these groups are classified as carcinogenic or as sensitisers. Check individual classification details on the safety data sheet for information on classification.
Australia Exposure Standards	cobalt	Cobalt, metal dust & fume (as Co)	0.05 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	ammonium dichromate	Chromium (VI) compounds (as Cr), water soluble	0.05 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	copper	Copper (fume)	0.2 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	copper	Copper, dusts & mists (as Cu)	1 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	ferric nitrate	Iron salts, soluble (as Fe)	1 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	indium	Indium & compounds (as In)	0.1 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	manganese(II) acetate tetrahydrate	Manganese, dust & compounds (as Mn)	1 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	nickel	Nickel, metal	1 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	nickel	Nickel, powder	1 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	lead nitrate	Lead, inorganic dusts & fumes (as Pb)	0.05 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	nitric acid	Nitric acid	2 ppm / 5.2 mg/m3	10 mg/m3 / 4 ppm	Not Available	Not Available

Emergency Limits

Ingredient	TEEL-1	TEEL-2	TEEL-3
silver nitrate	0.047 mg/m3	0.9 mg/m3	5.4 mg/m3
aluminium nitrate	47 mg/m3	68 mg/m3	410 mg/m3
aluminium nitrate	83 mg/m3	920 mg/m3	5,500 mg/m3
boric acid	6 mg/m3	23 mg/m3	830 mg/m3
barium nitrate	2.9 mg/m3	350 mg/m3	2,100 mg/m3
bismuth	15 mg/m3	170 mg/m3	990 mg/m3
calcium carbonate	45 mg/m3	210 mg/m3	1,300 mg/m3
cadmium	Not Available	Not Available	Not Available
cobalt	0.18 mg/m3	2 mg/m3	20 mg/m3
ammonium dichromate	0.37 mg/m3	6.3 mg/m3	38 mg/m3
copper	3 mg/m3	33 mg/m3	200 mg/m3
ferric nitrate	13 mg/m3	140 mg/m3	850 mg/m3
ferric nitrate	22 mg/m3	110 mg/m3	640 mg/m3
gallium	30 mg/m3	330 mg/m3	2,000 mg/m3
indium	0.3 mg/m3	3.3 mg/m3	20 mg/m3
potassium nitrate	9 mg/m3	100 mg/m3	600 mg/m3
lithium carbonate	3.1 mg/m3	34 mg/m3	210 mg/m3
magnesium nitrate	30 mg/m3	330 mg/m3	2,000 mg/m3
magnesium nitrate	16 mg/m3	180 mg/m3	1,100 mg/m3
manganese(II) acetate tetrahydrate	13 mg/m3	22 mg/m3	740 mg/m3
manganese(II) acetate tetrahydrate	9.4 mg/m3	16 mg/m3	96 mg/m3
sodium nitrate	4.1 mg/m3	45 mg/m3	270 mg/m3

Continued...

Ingredient	TEEL-1	TEEL-2	TEEL-3
nickel	4.5 mg/m3	50 mg/m3	99 mg/m3
lead nitrate	0.24 mg/m3	180 mg/m3	1,100 mg/m3
strontium nitrate	5.7 mg/m3	62 mg/m3	370 mg/m3
thallium	0.06 mg/m3	3.3 mg/m3	20 mg/m3
zinc	6 mg/m3	21 mg/m3	120 mg/m3
nitric acid	Not Available	Not Available	Not Available

Ingredient	Original IDLH	Revised IDLH
silver nitrate	10 mg/m3	Not Available
aluminium nitrate	Not Available	Not Available
boric acid	Not Available	Not Available
barium nitrate	50 mg/m3	Not Available
bismuth	Not Available	Not Available
calcium carbonate	Not Available	Not Available
cadmium	9 mg/m3	Not Available
cobalt	20 mg/m3	Not Available
ammonium dichromate	Not Available	Not Available
copper	100 mg/m3	Not Available
ferric nitrate	Not Available	Not Available
gallium	Not Available	Not Available
indium	Not Available	Not Available
potassium nitrate	Not Available	Not Available
lithium carbonate	Not Available	Not Available
magnesium nitrate	Not Available	Not Available
manganese(II) acetate tetrahydrate	500 mg/m3	Not Available
sodium nitrate	Not Available	Not Available
nickel	10 mg/m3	Not Available
lead nitrate	100 mg/m3	Not Available
strontium nitrate	Not Available	Not Available
thallium	Not Available	Not Available
zinc	Not Available	Not Available
nitric acid	25 ppm	Not Available
water	Not Available	Not Available

Occupational Exposure Banding

Ingredient	Occupational Exposure Band Rating	Occupational Exposure Band Limit
boric acid	D	> 0.01 to ≤ 0.1 mg/m³
gallium	E	≤ 0.01 mg/m³
potassium nitrate	E	≤ 0.01 mg/m³
lithium carbonate	E	≤ 0.01 mg/m³
magnesium nitrate	E	≤ 0.01 mg/m³
sodium nitrate	E	≤ 0.01 mg/m³
strontium nitrate	E	≤ 0.01 mg/m³
thallium	E	≤ 0.01 mg/m³
Notes:	*Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.*	

Exposure controls

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.
Individual protection measures, such as personal protective equipment	

Continued...

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. ▸ Chemical goggles.whenever there is a danger of the material coming in contact with the eyes; goggles must be properly fitted. ▸ Full face shield (20 cm, 8 in minimum) may be required for supplementary but never for primary protection of eyes; these afford face protection. ▸ Alternatively a gas mask may replace splash goggles and face shields.
Skin protection	See Hand protection below
Hands/feet protection	▸ Elbow length PVC gloves ▸ When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots. **NOTE:** ▸ 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. ▸ Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed.
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] ▸ 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] ▸ 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. ▸ 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. ▸ Prior to removing protective garments the employee should undergo decontamination and be required to shower upon removal of the garments and hood.

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:
ICP multi-element standard solution IV

Material	CPI
BUTYL	A
NEOPRENE	A
HYPALON	C
NATURAL RUBBER	C
NATURAL+NEOPRENE	C
NEOPRENE/NATURAL	C
NITRILE	C
NITRILE+PVC	C
PE/EVAL/PE	C
PVA	C
PVC	C
SARANEX-23	C
VITON	C

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

Respiratory protection

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

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required. Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	E-AUS P2	-	E-PAPR-AUS / Class 1 P2
up to 50 x ES	-	E-AUS / Class 1 P2	-
up to 100 x ES	-	E-2 P2	E-PAPR-2 P2 ^

^ - Full-face
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 compounds(below 65 degC)

SECTION 9 Physical and chemical properties

Information on basic physical and chemical properties

Appearance	Clear liquid

Physical state	Liquid	**Relative density (Water = 1)**	1.02

Continued...

Odour	Not Available	**Partition coefficient n-octanol / water**	Not Available
Odour threshold	Not Available	**Auto-ignition temperature (°C)**	Not Available
pH (as supplied)	<2.0	**Decomposition temperature (°C)**	Not Available
Melting point / freezing point (°C)	Not Available	**Viscosity (cSt)**	Not Available
Initial boiling point and boiling range (°C)	Not Available	**Molecular weight (g/mol)**	Not Available
Flash point (°C)	Not Available	**Taste**	Not Available
Evaporation rate	Not Available	**Explosive properties**	Not Available
Flammability	Not Available	**Oxidising properties**	Not Available
Upper Explosive Limit (%)	Not Available	**Surface Tension (dyn/cm or mN/m)**	Not Available
Lower Explosive Limit (%)	Not Available	**Volatile Component (%vol)**	Not Available
Vapour pressure (kPa)	2.47	**Gas group**	Not Available
Solubility in water	Miscible	**pH as a solution (1%)**	Not Available
Vapour density (Air = 1)	0.62	**VOC g/L**	Not Available

SECTION 10 Stability and reactivity

Reactivity	See section 7
Chemical stability	▸ Unstable in the presence of incompatible materials. ▸ Product is considered stable. ▸ 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	The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage. Corrosive acids can cause irritation of the respiratory tract, with coughing, choking and mucous membrane damage. There may be dizziness, headache, nausea and weakness. Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may produce severe damage to the health of the individual. Relatively small amounts absorbed through the lungs may prove fatal. Borates may act as simple airway irritants. Dryness of the mouth, nose or throat, dry cough, nose bleeds, sore throat, productive cough, shortness of breath, chest tightness and difficulty breathing were related to higher dose long term exposures. Exposure to indium compounds leads to tooth decay, joint and bone pain, disorders in the nervous and gastrointestinal systems, heart pains and general debility. Swelling of the lungs is common although scarring is rarely seen. Inhalation of nitric acid mist or fumes may produce respiratory symptoms. Depending on the concentration and duration of exposure, cough, gagging, chest pain, low body oxygen, lung irritation and damage may occur. Deaths have occurred and may be delayed for several days.
Ingestion	Ingestion of acidic corrosives may produce burns around and in the mouth, the throat and oesophagus. Immediate pain and difficulties in swallowing and speaking may also be evident. The substance and/or its metabolites may bind to haemoglobin inhibiting normal uptake of oxygen. This condition, known as "methaemoglobinemia", is a form of oxygen starvation (anoxia). Symptoms include cyanosis (a bluish discolouration skin and mucous membranes) and breathing difficulties. Symptoms may not be evident until several hours after exposure. Chromate salts are corrosive and produce cellular damage to tissue. Ingestion may produce inflammation of the digestive tract, nausea, vomiting and abdominal pain. Indium is poorly absorbed from the gut, but accumulation in the liver occurs when indium compounds are injected. Symptoms of indium poisoning include loss of appetite, nose-bleed, paralysis of limbs, rapid breathing, twitching, convulsions and tissue death of the liver and kidneys. The material has **NOT** been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence. The lethal oral dose of nitrite has been variously reported as between 0.7 and 6 grams (approximately 10-100 milligrams/kilogram body weight). This may be lower for children (especially newborns), the elderly, and people with certain enzyme deficiencies. Symptoms develop within 15-45 minutes. Inorganic nitrites produce smooth muscle relaxation, methaemoglobin in the blood, and cyanosis (a bluing of the extremities). Exposure to nitric acid causes burning pain, severe corrosion and scaring of the digestive tract with adhesions, narrowing and obstruction and even anaemia. There may be vomiting, aspiration, lung inflammation and shock. Death may be delayed 12 hours to 14 days or several months from these complications. Survivors may have strictures of the stomach lining and subsequent pernicious anaemia.

Continued...

	Ingestion or skin absorption of boric acid causes nausea, abdominal pain, diarrhoea and profuse vomiting which may be blood stained, headache, weakness, reddened lesions on the skin. In severe cases, it may cause shock, with fall in blood pressure, increase in heart rate, blue skin colour, brain and nervous irritation, reduced urine volume or even absence of urine. Borate poisoning causes nausea, vomiting, diarrhoea and pain in the upper abdomen. Often persistent vomiting occurs, and there may be blood in the faeces.
Skin Contact	Skin contact with acidic corrosives may result in pain and burns; these may be deep with distinct edges and may heal slowly with the formation of scar tissue. Skin contact is not thought to have harmful health effects (as classified under EC Directives); the material may still produce health damage following entry through wounds, lesions or abrasions. Though considered non-harmful, slight irritation may result from contact because of the abrasive nature of the aluminium oxide particles. Thus it may cause itching and skin reaction and inflammation. Boric acid is not absorbed via intact skin but absorbed on broken or inflamed skin. Skin contact may result in severe irritation particularly to broken skin. Ulceration known as "chrome ulcers" may develop. Chrome ulcers and skin cancer are significantly related. 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. Skin contact with nitric acid may cause corrosion, skin thickening, yellow discolouration of the skin, blisters and scars depending on the concentration exposed.
Eye	Direct eye contact with acid corrosives may produce pain, tears, sensitivity to light and burns. Mild burns of the epithelia generally recover rapidly and completely. If applied to the eyes, this material causes severe eye damage. Irritation of the eyes may produce a heavy secretion of tears (lachrymation). Eye contact with both diluted and concentrated nitric acid may result in burns causing pain, adhesions, corneal damage, blindness or permanent eye damage. Pain may be absent after contact with concentrated nitric acid.
Chronic	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. Long-term exposure to respiratory irritants may result in airways disease, involving difficulty breathing and related whole-body problems. Inhaling 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. There is ample evidence to presume that exposure to this material can cause genetic defects that can be inherited. 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, in contact with skin and if swallowed. 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. Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure. Animal testing shows long term exposure to aluminium oxides may cause lung disease and cancer, depending on the size of the particle. The smaller the size, the greater the tendencies of causing harm. 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. Chronic indium intoxication leads to weight loss, poor growth and extensive necrotic damage to the liver and kidneys. Indium can impede protein synthesis, thereby affecting numerous essential physiological processes, including detoxification of organic cancer causing substances. Intravenous indium chloride may be toxic to the kidney and liver. Damage to the brain, heart, adrenals, spleen and blood may also result from chronic exposures. Animal testing to see whether nitrites caused cancer proved inconclusive. Prolonged or repeated overexposure to low concentrations of nitric acid vapour may cause chronic airway inflammation, corrosion of teeth and chemical lung inflammation. Chronic boric acid poisoning is characterized by mild gastrointestinal irritation, loss of appetite, disturbed digestion, nausea, possibly vomiting and a hard irregular and discoloured rash. Dryness of skin, reddening of tongue, loss of hair, inflammation of conjunctiva, and kidney injury have also been reported. Borate can accumulate in the testes and deplete germ cells and cause withering of the testicles, according to animal testing. Hair loss, skin inflammation, stomach ulcer and anaemia can all occur.

ICP multi-element standard solution IV	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
silver nitrate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Eye (rabbit): 1 mg - SEVERE
	Oral (Rat) LD50: 50 mg/kg[2]	Eye (rabbit): 10 mg - moderate
aluminium nitrate	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: >5000 mg/kg[1]	Eye (rabbit): 100mg - SEVERE
	Oral (Rat) LD50: 204 mg/kg[2]	Skin (rabbit): 500mg - mild
boric acid	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: >2000 mg/kg[1]	Eye: no adverse effect observed (not irritating)[1]
	Inhalation(Rat) LC50: >2.12 mg/l4h[1]	Skin (human): 15 mg/3d -I- mild
	Oral (Rat) LD50: >2600 mg/kg[1]	Skin: no adverse effect observed (not irritating)[1]
barium nitrate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Eye (rabbit):100 mg/24h - moderate
	Oral (Rat) LD50: >50<300 mg/kg[1]	Skin (rabbit): 500 mg/24h - mild

Continued...

bismuth	**TOXICITY**	**IRRITATION**
	Oral (Rat) LD50: 5000 mg/kg[2]	Not Available
calcium carbonate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Eye (rabbit): 0.75 mg/24h - SEVERE
	Inhalation(Rat) LC50: >3 mg/l4h[1]	Eye: no adverse effect observed (not irritating)[1]
	Oral (Rat) LD50: >2000 mg/kg[1]	Skin (rabbit): 500 mg/24h-moderate
		Skin: no adverse effect observed (not irritating)[1]
cadmium	**TOXICITY**	**IRRITATION**
	Inhalation(Rabbit) LC50; 0.028 mg/L4h[1]	Not Available
	Oral (Rat) LD50: 225 mg/kg[2]	
cobalt	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Eye: adverse effect observed (irritating)[1]
	Inhalation(Rat) LC50: <=0.05 mg/l4h[1]	Skin: no adverse effect observed (not irritating)[1]
	Oral (Rat) LD50: ~550 mg/kg[1]	
ammonium dichromate	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: 1640 mg/kg[2]	Not Available
	Inhalation(Rat) LC50: 0.156 mg/l4h[2]	
	Oral (Rat) LD50: 53.75 mg/kg[2]	
copper	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Eye: no adverse effect observed (not irritating)[1]
	Inhalation(Rat) LC50: 0.733 mg/l4h[1]	Skin: no adverse effect observed (not irritating)[1]
	Oral (Mouse) LD50; 0.7 mg/kg[2]	
ferric nitrate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Not Available
	Oral (Rat) LD50: >2000 mg/kg[1]	
gallium	**TOXICITY**	**IRRITATION**
	Oral (Rat) LD50: 500 mg/kg[1]	Skin: no adverse effect observed (not irritating)[1]
indium	**TOXICITY**	**IRRITATION**
	Oral (Rat) LD50: >2000 mg/kg[1]	Eye: no adverse effect observed (not irritating)[1]
		Skin: no adverse effect observed (not irritating)[1]
potassium nitrate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >5000 mg/kg[1]	Not Available
	Inhalation(Rat) LC50: >0.527 mg/l4h[1]	
	Oral (Rabbit) LD50; 1901 mg/kg[2]	
lithium carbonate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Eye (rabbit) : Moderate *
	Inhalation(Rat) LC50: >0.8 mg/L4h[2]	Skin (rabbit) : Mild *
	Oral (Rat) LD50: 525 mg/kg[2]	
magnesium nitrate	**TOXICITY**	**IRRITATION**
	Oral (Rat) LD50: 5440 mg/kg[2]	Eye (rabbit): 500 mg/24h - mild
		Skin (rabbit): 500 mg/24h - mild
manganese(II) acetate tetrahydrate	**TOXICITY**	**IRRITATION**
	Oral (Rat) LD50: 3730 mg/kg[2]	Not Available
sodium nitrate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >5000 mg/kg[1]	Not Available
	Oral (Rat) LD50: 1267 mg/kg[2]	

Continued...

nickel	**TOXICITY**	**IRRITATION**
	Oral (Rat) LD50: 5000 mg/kg[2]	Eye: no adverse effect observed (not irritating)[1]
		Skin: no adverse effect observed (not irritating)[1]
lead nitrate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Not Available
	Inhalation(Rat) LC50: >5.05 mg/l4h[1]	
	Oral (Rat) LD50: >2000 mg/kg[1]	
strontium nitrate	**TOXICITY**	**IRRITATION**
	Inhalation(Rat) LC50: >4.5 mg/l4h[1]	Eye: adverse effect observed (irritating)[1]
	Oral (Rat) LD50: >2000 mg/kg[1]	Skin: no adverse effect observed (not irritating)[1]
thallium	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
zinc	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: 1130 mg/kg[2]	Eye: no adverse effect observed (not irritating)[1]
	Oral (Rat) LD50: >2000 mg/kg[1]	Skin: no adverse effect observed (not irritating)[1]
nitric acid	**TOXICITY**	**IRRITATION**
	Inhalation(Rat) LC50: 0.13 mg/L4h[2]	Eye: adverse effect observed (irritating)[1]
		Skin: adverse effect observed (corrosive)[1]
water	**TOXICITY**	**IRRITATION**
	Oral (Rat) LD50: >90000 mg/kg[2]	Not Available
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*	

SILVER NITRATE	Reproductive effector in rats Human lymphocyte mutagen Equivocal tumorigen by RTECS criteria
BARIUM NITRATE	The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
CALCIUM CARBONATE	No evidence of carcinogenic properties. No evidence of mutagenic or teratogenic effects.
AMMONIUM DICHROMATE	**WARNING:** This substance has been classified by the IARC as Group 1: **CARCINOGENIC TO HUMANS**.
COPPER	WARNING: Inhalation of high concentrations of copper fume may cause "metal fume fever", an acute industrial disease of short duration. Symptoms are tiredness, influenza like respiratory tract irritation with fever. for copper and its compounds (typically copper chloride): **Acute toxicity:** There are no reliable acute oral toxicity results available. In an acute dermal toxicity study (OECD TG 402), one group of 5 male rats and 5 groups of 5 female rats received doses of 1000, 1500 and 2000 mg/kg bw via dermal application for 24 hours. The LD50 values of copper monochloride were 2,000 mg/kg bw or greater for male (no deaths observed) and 1,224 mg/kg bw for female. Four females died at both 1500 and 2000 mg/kg bw, and one at 1,000 mg/kg bw.
GALLIUM	Substance has been investigated as a mutagen by DNA inhibition in human lymphocytes.
LITHIUM CARBONATE	Lacrimation, altered sleep times, hallucinations, distorted perception, toxic psychosis, excitement, ataxia, respiratory depression, allergic dermatitis (after sytemic administration), foetoxicity and foetolethality and specific development abnormalities recorded. Non-sensitising guinea pig * * FMC SDS Goitrogenic: Goitrogens are substances that suppress the function of the thyroid gland by interfering with iodine uptake, which can, as a result, cause an enlargement of the thyroid (a goitre). Goitrogens include: - Vitexin, a flavonoid, which inhibits thyroid peroxidase, contributing to goitre - Thiocyanate and perchlorate, which decrease iodide uptake by competitive inhibition and consequently increase release of TSH from the pituitary gland - Lithium, which inhibits thyroid hormone release - Certain foods, such as soy and millet (containing vitexins) and vegetables in the genus Brassica (which includes broccoli, Brussels sprouts, cabbage, cauliflower and horseradish). - Caffeine (found in coffee, tea, cola and chocolate), which acts on thyroid function as a suppressant. The material may trigger oculogyric crisis. The term "oculogyric" refers to the bilateral elevation of the visual gaze. Initial symptoms include restlessness, agitation, malaise, or a fixed stare. Then comes the more characteristically described extreme and sustained upward deviation of the eyes. In addition, the eyes may converge, deviate upward and laterally, or deviate downward.
MAGNESIUM NITRATE	Magnesium nitrate heaxahydrate is a methaemoglobin-forming agent which if inhaled or ingested in high enough concentrations may cause fatigue, headache, dizziness. (Source: I.L.O. Encyclopaedia) The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
SODIUM NITRATE	Laboratory (in vitro) and animal studies show, exposure to the material may result in a possible risk of irreversible effects, with the possibility of producing mutation.
NICKEL	Oral (rat) TDLo: 500 mg/kg/5D-I Inhalation (rat) TCLo: 0.1 mg/m3/24H/17W-C Tenth Annual Report on Carcinogens: Substance anticipated to be Carcinogen [*National Toxicology Program: U.S. Dep. of Health & Human Services 2002*]

Continued...

THALLIUM	Structural changes in nerves and sheath, changes in extraocular muscles, hair loss recorded
NITRIC ACID	Oral (?) LD50: 50-500 mg/kg * [Various Manufacturers] The material may produce respiratory tract irritation, and result in damage to the lung including reduced lung function. The material may cause severe skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin. Repeated exposures may produce severe ulceration.
ICP multi-element standard solution IV & SILVER NITRATE & CALCIUM CARBONATE & AMMONIUM DICHROMATE & FERRIC NITRATE & GALLIUM & LITHIUM CARBONATE & MANGANESE(II) ACETATE TETRAHYDRATE & SODIUM NITRATE & LEAD NITRATE & STRONTIUM NITRATE & NITRIC ACID	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.
ICP multi-element standard solution IV & COBALT & AMMONIUM DICHROMATE	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.
ICP multi-element standard solution IV & COBALT & AMMONIUM DICHROMATE & COPPER & NICKEL	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.
ICP multi-element standard solution IV & NITRIC ACID	For acid mists, aerosols, vapours Test results suggest that eukaryotic cells are susceptible to genetic damage when the pH falls to about 6.5. Cells from the respiratory tract have not been examined in this respect. Mucous secretion may protect the cells of the airway from direct exposure to inhaled acidic mists (which also protects the stomach lining from the hydrochloric acid secreted there).
SILVER NITRATE & ALUMINIUM NITRATE & CALCIUM CARBONATE & NITRIC ACID	The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
ALUMINIUM NITRATE & BORIC ACID & BARIUM NITRATE & CALCIUM CARBONATE & MAGNESIUM NITRATE & ZINC	The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.
COBALT & NICKEL	**WARNING:** This substance has been classified by the IARC as Group 2B: Possibly Carcinogenic to Humans.
AMMONIUM DICHROMATE & GALLIUM & INDIUM & ZINC & WATER	No significant acute toxicological data identified in literature search.

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

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

SECTION 12 Ecological information

Toxicity

ICP multi-element standard solution IV

Endpoint	Test Duration (hr)	Species	Value	Source
Not Available	Not Available	Not Available	Not Available	Not Available

silver nitrate

Endpoint	Test Duration (hr)	Species	Value	Source
BCF	792h	Fish	<54-310	7
NOEC(ECx)	192h	Crustacea	0.000001mg/l	4
EC50	96h	Algae or other aquatic plants	0.0099mg/l	2
EC50	72h	Algae or other aquatic plants	0.0034mg/l	2
LC50	96h	Fish	~0.0003mg/l	4
EC50	48h	Crustacea	0.00026mg/l	2

aluminium nitrate

Endpoint	Test Duration (hr)	Species	Value	Source
LC50	96h	Fish	>0.105mg/l	2
EC50	72h	Algae or other aquatic plants	0.075mg/l	2

Continued...

	EC50	48h	Crustacea	0.33mg/l	2
	EC10(ECx)	72h	Algae or other aquatic plants	0.015mg/l	2

boric acid

Endpoint	Test Duration (hr)	Species	Value	Source
LC50	96h	Fish	70-80mg/l	4
BCF	672h	Fish	<3.2	7
EC50	72h	Algae or other aquatic plants	40.2mg/l	2
EC50	48h	Crustacea	230mg/L	5
NOEC(ECx)	576h	Fish	0.001mg/L	5
EC50	96h	Algae or other aquatic plants	15.4mg/l	2

barium nitrate

Endpoint	Test Duration (hr)	Species	Value	Source
LC50	96h	Fish	>3.5mg/l	2
EC50	72h	Algae or other aquatic plants	>1.15mg/l	2
EC50	48h	Crustacea	>=16<=18mg/l	2
NOEC(ECx)	72h	Algae or other aquatic plants	>=1.15mg/l	2

bismuth

Endpoint	Test Duration (hr)	Species	Value	Source
ErC50	72h	Algae or other aquatic plants	>1.26mg/l	2
NOEC(ECx)	72h	Algae or other aquatic plants	1mg/l	2
EC50	72h	Algae or other aquatic plants	>1.26mg/l	2
LC50	96h	Fish	>100mg/l	2
EC50	48h	Crustacea	>1.26mg/l	2

calcium carbonate

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	1h	Fish	4-320mg/l	4
LC50	96h	Fish	>165200mg/L	4
EC50	72h	Algae or other aquatic plants	>14mg/l	2

cadmium

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	672h	Fish	0.00002mg/l	4
EC50	96h	Algae or other aquatic plants	0.049-0.162mg/l	4
EC50	72h	Algae or other aquatic plants	0.018mg/l	2
LC50	96h	Fish	4.2-6.9mg/l	Not Available
EC50	48h	Crustacea	0.0054-0.0374mg/l	4

cobalt

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	72h	Algae or other aquatic plants	0.01-0.015mg/l	1
EC50	96h	Algae or other aquatic plants	23.8mg/l	2
EC50	72h	Algae or other aquatic plants	0.0288mg/l	2
LC50	96h	Fish	0.8mg/l	2
EC50	48h	Crustacea	0.241mg/l	2

ammonium dichromate

Endpoint	Test Duration (hr)	Species	Value	Source
LC50	96h	Fish	292.4mg/L	4

copper

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	48h	Fish	0.00009mg/l	4
EC50	96h	Algae or other aquatic plants	0.03-0.058mg/l	4
EC50	72h	Algae or other aquatic plants	0.011-0.017mg/L	4
LC50	96h	Fish	0.0028mg/l	2
EC50	48h	Crustacea	0.0006-0.0017mg/l	4

ferric nitrate

Endpoint	Test Duration (hr)	Species	Value	Source
LC50	96h	Fish	1010mg/l	2
EC50	72h	Algae or other aquatic plants	18mg/l	2
NOEC(ECx)	3504h	Fish	1.6mg/l	2

gallium

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	72h	Algae or other aquatic plants	<0.3mg/l	2
EC50	72h	Algae or other aquatic plants	0.63mg/l	2

Continued...

	EC50	48h	Crustacea	14.96mg/l	2

indium

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	72h	Algae or other aquatic plants	>0.00032mg/l	2
EC50	72h	Algae or other aquatic plants	>0.00032mg/l	2
LC50	96h	Fish	19.519mg/l	2
EC50	48h	Crustacea	1.31mg/l	2

potassium nitrate

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	144h	Fish	0.1mg/l	4
LC50	96h	Fish	>100mg/l	2
EC50	48h	Crustacea	490mg/l	2

lithium carbonate

Endpoint	Test Duration (hr)	Species	Value	Source
EC50(ECx)	48h	Crustacea	33.2mg/l	Not Available
EC50	72h	Algae or other aquatic plants	>400mg/l	2
LC50	96h	Fish	30.3mg/l	Not Available
EC50	48h	Crustacea	33.2mg/l	Not Available

magnesium nitrate

Endpoint	Test Duration (hr)	Species	Value	Source
EC50(ECx)	24h	Crustacea	6075mg/L	5

manganese(II) acetate tetrahydrate

Endpoint	Test Duration (hr)	Species	Value	Source
EC10(ECx)	240h	Algae or other aquatic plants	~5.1mg/l	2
LC50	96h	Fish	2850mg/l	2
EC50	96h	Algae or other aquatic plants	31mg/l	2
EC50	48h	Crustacea	65mg/l	2

sodium nitrate

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	1056h	Algae or other aquatic plants	0.2mg/l	4
LC50	96h	Fish	7.1mg/l	4
EC50	48h	Crustacea	3581mg/l	2

nickel

Endpoint	Test Duration (hr)	Species	Value	Source
EC50(ECx)	72h	Algae or other aquatic plants	0.18mg/l	1
EC50	96h	Algae or other aquatic plants	0.174-0.311mg/l	4
EC50	72h	Algae or other aquatic plants	0.18mg/l	1
LC50	96h	Fish	0.06mg/l	4
EC50	48h	Crustacea	>100mg/l	1

lead nitrate

Endpoint	Test Duration (hr)	Species	Value	Source
LC50	96h	Fish	0.0079mg/l	2
BCF	888h	Fish	72-250	7
EC50	72h	Algae or other aquatic plants	0.0205mg/l	2
EC50	48h	Crustacea	0.029mg/l	2
NOEC(ECx)	96h	Fish	<0.001mg/L	4
EC50	96h	Algae or other aquatic plants	1.755mg/L	4

strontium nitrate

Endpoint	Test Duration (hr)	Species	Value	Source
LC50	96h	Fish	>40.3mg/l	2
EC50	72h	Algae or other aquatic plants	>43.3mg/l	2
EC50	48h	Crustacea	94mg/l	2
NOEC(ECx)	480h	Algae or other aquatic plants	15mg/l	2

thallium

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	720h	Fish	0.04mg/L	5
LC50	96h	Fish	1.8mg/l	4

zinc

Endpoint	Test Duration (hr)	Species	Value	Source
EC10(ECx)	168h	Algae or other aquatic plants	0.0025mg/l	2

Continued...

	EC50	96h	Algae or other aquatic plants	0.042mg/l	2
	EC50	72h	Algae or other aquatic plants	0.005mg/l	4
	LC50	96h	Fish	0.01068-0.01413mg/l	4
	EC50	48h	Crustacea	0.06-0.08mg/l	4

nitric acid	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	EC50(ECx)	96h	Crustacea	39mg/l	2
	LC50	96h	Fish	102.24mg/L	4
	EC50	48h	Crustacea	490mg/l	2

water	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	Not Available	Not Available	Not Available	Not Available	Not Available

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*

Harmful 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.
Ecotoxicity:
The tolerance of water organisms towards pH margin and variation is diverse. Recommended pH values for test species listed in OECD guidelines are between 6.0 and almost 9.
Acute testing with fish showed 96h-LC50 at about pH 3.5
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.
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.
Indium is used in LCD-displays, batteries and electronics. The most important route of dispersal to the environment is through solid waste and residuals from waste incineration. No data is currently available on the environmental toxicity of indium, and, consequently, the possible environmental impacts of indium cannot be assessed. However, due to the low consumption of indium and the low concentrations found in waste, the actual risk of adverse effects on environment and health is considered to be low.
for Boron and Borates:
Environmental Fate - Boron is generally found in nature bound to oxygen and is never found as the free element. As an element, boron itself cannot be degraded in the environment, however; it may undergo various reactions that change the form of boron (e.g., precipitation, polymerization, and acid-base reactions) depending on conditions such as its concentration in water and pH. As boron is a natural component of the environment, individuals will have some exposure from foods and drinking water.
Atmospheric Fate: Atmospheric boron may be in the form of particulate matter or aerosols as borides, boron oxides, borates, borates, organoboron compounds, trihalide boron compounds, or borazines.
For Nitrate/Nitrite
Environmental Fate: Nitrates form from nitrate or ammonium ions by micro-organisms in soil, water, sewage and the digestive tract. The concern with nitrate in the environment is related to its conversion to nitrite. Primary sources of organic nitrates include human sewage and livestock manure, especially from feedlots.
Atmospheric Fate: Nitrate/nitrites do not evaporate into the air; however, any nitrites released into the air slowly oxidize to nitrates.
DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
silver nitrate	LOW	LOW
aluminium nitrate	LOW	LOW
boric acid	LOW	LOW
potassium nitrate	LOW	LOW
lithium carbonate	LOW	LOW
sodium nitrate	LOW	LOW
water	LOW	LOW

Bioaccumulative potential

Ingredient	Bioaccumulation
silver nitrate	MEDIUM (BCF = 600)
aluminium nitrate	LOW (LogKOW = 0.209)
boric acid	LOW (BCF = 0)
potassium nitrate	LOW (LogKOW = 0.209)
lithium carbonate	LOW (LogKOW = -0.4605)
sodium nitrate	LOW (LogKOW = 0.209)
lead nitrate	LOW (BCF = 250)

Mobility in soil

Ingredient	Mobility
silver nitrate	LOW (KOC = 14.3)
aluminium nitrate	LOW (KOC = 14.3)

Continued...

Ingredient	Mobility
boric acid	LOW (KOC = 35.04)
potassium nitrate	LOW (KOC = 14.3)
lithium carbonate	HIGH (KOC = 1)
sodium nitrate	LOW (KOC = 14.3)

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. ▸ 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: Neutralisation with soda-ash or soda-lime 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).

SECTION 14 Transport information

Labels Required

	
Marine Pollutant	NO
HAZCHEM	2X

Land transport (ADG)

UN number or ID number	3264
UN proper shipping name	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Nitric acid solution)
Transport hazard class(es)	Class: 8 Subsidiary risk: Not Applicable
Packing group	III
Environmental hazard	Not Applicable
Special precautions for user	Special provisions: 223 274 Limited quantity: 5 L

Air transport (ICAO-IATA / DGR)

UN number	3264
UN proper shipping name	Corrosive liquid, acidic, inorganic, n.o.s. * (Nitric acid solution)
Transport hazard class(es)	ICAO/IATA Class: 8 ICAO / IATA Subrisk: Not Applicable ERG Code: 8L
Packing group	III
Environmental hazard	Not Applicable
Special precautions for user	Special provisions: A3 A803 Cargo Only Packing Instructions: 856 Cargo Only Maximum Qty / Pack: 60 L Passenger and Cargo Packing Instructions: 852 Passenger and Cargo Maximum Qty / Pack: 5 L Passenger and Cargo Limited Quantity Packing Instructions: Y841 Passenger and Cargo Limited Maximum Qty / Pack: 1 L

Sea transport (IMDG-Code / GGVSee)

UN number	3264

Continued...

UN proper shipping name	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Nitric acid solution)
Transport hazard class(es)	IMDG Class: 8 IMDG Subrisk: Not Applicable
Packing group	III
Environmental hazard	Not Applicable
Special precautions for user	EMS Number: F-A, S-B Special provisions: 223 274 Limited Quantities: 5 L

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

Not Applicable

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

Product name	Group
silver nitrate	Not Available
aluminium nitrate	Not Available
boric acid	Not Available
barium nitrate	Not Available
bismuth	Not Available
calcium carbonate	Not Available
cadmium	Not Available
cobalt	Not Available
ammonium dichromate	Not Available
copper	Not Available
ferric nitrate	Not Available
gallium	Not Available
indium	Not Available
potassium nitrate	Not Available
lithium carbonate	Not Available
magnesium nitrate	Not Available
manganese(II) acetate tetrahydrate	Not Available
sodium nitrate	Not Available
nickel	Not Available
lead nitrate	Not Available
strontium nitrate	Not Available
thallium	Not Available
zinc	Not Available
nitric acid	Not Available
water	Not Available

Transport in bulk in accordance with the IGC Code

Product name	Ship Type
silver nitrate	Not Available
aluminium nitrate	Not Available
boric acid	Not Available
barium nitrate	Not Available
bismuth	Not Available
calcium carbonate	Not Available
cadmium	Not Available
cobalt	Not Available
ammonium dichromate	Not Available
copper	Not Available
ferric nitrate	Not Available
gallium	Not Available
indium	Not Available
potassium nitrate	Not Available
lithium carbonate	Not Available
magnesium nitrate	Not Available

Continued...

Product name	Ship Type
manganese(II) acetate tetrahydrate	Not Available
sodium nitrate	Not Available
nickel	Not Available
lead nitrate	Not Available
strontium nitrate	Not Available
thallium	Not Available
zinc	Not Available
nitric acid	Not Available
water	Not Available

SECTION 15 Regulatory information

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

silver nitrate is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Australian Inventory of Industrial Chemicals (AIIC)
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 2A: Probably carcinogenic to humans

aluminium nitrate is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
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 2A: Probably carcinogenic to humans

boric acid is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5
Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List

barium nitrate is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Australian Inventory of Industrial Chemicals (AIIC)
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 2A: Probably carcinogenic to humans

bismuth is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

calcium carbonate is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

cadmium 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
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
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

cobalt is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4
Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List
FEI Equine Prohibited Substances List - Controlled Medication
FEI Equine Prohibited Substances List (EPSL)
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 2A: Probably carcinogenic to humans
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

ammonium dichromate 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

copper is found on the following regulatory lists

Continued...

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Australian Inventory of Industrial Chemicals (AIIC)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

ferric nitrate is found on the following regulatory lists

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 2
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Australian Inventory of Industrial Chemicals (AIIC)
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 2A: Probably carcinogenic to humans

gallium is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

indium is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

potassium nitrate is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
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 2A: Probably carcinogenic to humans

lithium carbonate is found on the following regulatory lists

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

magnesium nitrate is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
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 2A: Probably carcinogenic to humans

manganese(II) acetate tetrahydrate is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)

sodium nitrate is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
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 2A: Probably carcinogenic to humans

nickel is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

lead nitrate is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
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 2A: Probably carcinogenic to humans

strontium nitrate is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
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 2A: Probably carcinogenic to humans

thallium 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 7
Australian Inventory of Industrial Chemicals (AIIC)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

zinc is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

nitric acid is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5
Australian Inventory of Industrial Chemicals (AIIC)

Continued...

water is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

National Inventory Status

National Inventory	Status
Australia - AIIC / Australia Non-Industrial Use	Yes
Canada - DSL	Yes
Canada - NDSL	No (silver nitrate; aluminium nitrate; boric acid; barium nitrate; bismuth; cadmium; cobalt; ammonium dichromate; copper; ferric nitrate; gallium; indium; potassium nitrate; lithium carbonate; magnesium nitrate; manganese(II) acetate tetrahydrate; sodium nitrate; nickel; lead nitrate; strontium nitrate; thallium; zinc; nitric acid; water)
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	Yes
Japan - ENCS	No (bismuth; cadmium; cobalt; copper; gallium; indium; manganese(II) acetate tetrahydrate; nickel; thallium; zinc)
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* *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	14/05/2023
Initial Date	14/05/2023

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
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

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end of SDS