SECTION 1 IDENTIFICATION

Product Identifier

<table>
<thead>
<tr>
<th>Product name</th>
<th>ICP Multielement Calibration Standard 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonyms</td>
<td>ICP-MCS-3</td>
</tr>
<tr>
<td>Proper shipping name</td>
<td>Hydrochloric acid (contains hydrochloric acid)</td>
</tr>
<tr>
<td>Other means of identification</td>
<td>ICP-MCS-3</td>
</tr>
</tbody>
</table>

Recommended use of the chemical and restrictions on use

Relevant identified uses

Use according to manufacturer’s directions.

Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party

<table>
<thead>
<tr>
<th>Registered company name</th>
<th>High-Purity Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
<td>PO Box 41727 SC 29423 United States</td>
</tr>
<tr>
<td>Telephone</td>
<td>843-767-7900</td>
</tr>
<tr>
<td>Fax</td>
<td>843-767-7906</td>
</tr>
<tr>
<td>Website</td>
<td>highpuritystandards.com</td>
</tr>
<tr>
<td>Email</td>
<td>Not Available</td>
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</table>

Emergency phone number

<table>
<thead>
<tr>
<th>Association / Organisation</th>
<th>INFOTRAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency telephone numbers</td>
<td>1-800-535-5053</td>
</tr>
<tr>
<td>Other emergency telephone numbers</td>
<td>1-352-323-3500</td>
</tr>
</tbody>
</table>

SECTION 2 HAZARD(S) IDENTIFICATION

Classification of the substance or mixture

| Classification | Metal Corrosion Category 1, Skin Corrosion/Irritation Category 1A, Serious Eye Damage Category 1 |

Label elements

<table>
<thead>
<tr>
<th>Hazard pictogram(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>![DANGER]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SIGNAL WORD</th>
<th>DANGER</th>
</tr>
</thead>
</table>

Hazard statement(s)

| H290 | May be corrosive to metals. |
| H314 | Causes severe skin burns and eye damage. |

Hazard(s) not otherwise specified

Not Applicable

Precautionary statement(s) Prevention

Continued...
**SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS**

**Substances**
See section below for composition of Mixtures

**Mixtures**

<table>
<thead>
<tr>
<th>CAS No</th>
<th>% [weight]</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>7647-01-0</td>
<td>5</td>
<td>hydrochloric acid</td>
</tr>
<tr>
<td>7429-90-5</td>
<td>0.02</td>
<td>aluminium</td>
</tr>
<tr>
<td>7440-36-0</td>
<td>0.02</td>
<td>antimony</td>
</tr>
<tr>
<td>7440-47-3</td>
<td>0.002</td>
<td>chromium</td>
</tr>
<tr>
<td>7439-98-7</td>
<td>0.01</td>
<td>molybdenum</td>
</tr>
<tr>
<td>7440-09-7</td>
<td>0.04</td>
<td>potassium</td>
</tr>
<tr>
<td>497-19-8</td>
<td>0.02 (as Na)</td>
<td>sodium carbonate</td>
</tr>
<tr>
<td>7732-18-5</td>
<td>balance</td>
<td>water</td>
</tr>
</tbody>
</table>

**SECTION 4 FIRST-AID MEASURES**

**Description of first aid measures**

**Eye Contact**
If this product comes in contact with the eyes:
- Immediately hold eyelids apart and flush the eye continuously with running water.
- 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.

**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.
- Inhalation of vapours or aerosols (mists, fumes) may cause lung oedema.
- Corrosive substances may cause lung damage (e.g. lung oedema, fluid in the lungs).
- 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.
- Before any such manifestation, the administration of a spray containing a dexamethasone derivative or beclomethasone derivative may be considered. **This must definitely be left to a doctor or person authorised by him/her.**

**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.

**Most important symptoms and effects, both acute and delayed**
See Section 11

**Indication of any immediate medical attention and special treatment needed**
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.
- Skin injuries require retraction of the eyelids to ensure thorough irrigation of the conjunctival 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.
- Cyclopentolate, (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.

**SECTION 5 FIRE-FIGHTING 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.

**Special protective equipment and precautions for fire-fighters**

**Fire Fighting**
- 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.
- May emit corrosive, poisonous fumes. May emit acid smoke.

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.

**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.
- Check regularly for spills and leaks.
- 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.
- Wipe up.
- Place in a suitable, labelled container for waste disposal.

**Major Spills**
- Personal Protective Equipment advice is contained in Section 8 of the SDS.

**SECTION 7 HANDLING AND STORAGE**

**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.
- WARNING: To avoid violent reaction, ALWAYS add material to water and NEVER water to material.
- Avoid smoking, naked lights or ignition sources.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately. Launder contaminated clothing before re-use.
- Use good occupational work practice.
- Observe manufacturer's storage and handling recommendations contained within this SDS.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.
- DO NOT allow clothing wet with material to stay in contact with skin.
ICP Multielement Calibration Standard 3

Conditions for safe storage, including any incompatibilities

Suitable container

- **DO NOT** use aluminium or galvanised containers.
- Check regularly for spills and leaks.
- Lined metal can, lined metal palli can.
- Plastic palli.
- Polyliner drum.
- Packing as recommended by manufacturer.
- Check all containers are clearly labelled and free from leaks.
- 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 deg. and 40 deg C.):
  - Removable head packaging:
  - Cans with friction closures and
  - low pressure tubes and cartridges may be used.
- Where combination packages are used, and the inner packages are of glass, porcelain or stoneware, there must be sufficient inert cushioning material in contact with inner and outer packages unless the outer packaging is a close fitting moulded plastic box and the substances are not incompatible with the plastic.

Storage incompatibility

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.
- Produces exothermic reaction with oxygen difluoride.
- May form explosive mixture with oxygen difluoride.
- Forms explosive mixtures with sodium nitrate.
- Reacts vigorously with vinyl acetate.

Aluminium oxide is an amphoteric substance, meaning it can react with both acids and bases, such as hydrofluoric acid and sodium hydroxide, acting as an acid with a base and a base with an acid, neutralising the other and producing a salt.

- Inorganic acids are generally soluble in water with the release of hydrogen ions. The resulting solutions have pHs of less than 7.0.
- Inorganic acids neutralise chemical bases (for example: amines and inorganic hydrides) to form salts - neutralisation can generate dangerously large amounts of heat in small spaces.
- The dissolution of inorganic acids in water or the dilution of their concentrated solutions with additional water may generate significant heat.
- The addition of water to inorganic acids often generates sufficient heat in the small region of mixing to cause some of the water to boil explosively. The resulting "bumping" can spatter the acid.
- Inorganic acids react with active metals, including such structural metals as aluminium and iron, to release hydrogen, a flammable gas.
- Inorganic acids can initiate the polymerisation of certain classes of organic compounds.
- Inorganic acids react with cyanide compounds to release gaseous hydrogen cyanide.
- Inorganic acids generate flammable and/or toxic gases in contact with dihalocarbamates, isocyanates, mercaptans, nitriles, nitrides, sulfides, and strong reducing agents. Additional gas-generating reactions occur with sulfites, nitriles, thiosulfates (to give H2S and SO2), dithionites (SO2), and even carbonates.
- Acids often catalyse (increase the rate of) chemical reactions.

Hydrogen chloride:
- Reacts strongly with strong oxidisers (releasing chlorine gas), acetic anhydride, caesium cyanide/cyanate/cyanoacetate/2-), ethylendene difluoride, hexafluoridocarboxylic acid, metal acetylide, sodium, silicon dioxide, tetrastibanium tetratetradetride, and many organic materials.
- Incompatible with alkaline materials, acetic anhydride, acetylenes, aliphatic amines, alkylamines, alkylene oxides, aluminium, aluminium-titanium alloys, aromatic amines, amines, amides, 2-aminoethanol, ammonia, ammonium hydroxide, borides, calcium phosphide, carbides, carbonates, cyanides, chlorosulfonic acid, ethylenediamine, ethylenimine, epichlorhydrin, formamide, isocyanates, metals, metal oxides, metal hydroxides, metal acetylides, metal carbides, oleum, organic anhydrides, potassium permanganate, perchloric acid, phosphides, 3-propiolactone, silicides, sulfides, sulfites, sulfuric acid, uranium phosphate, vinyl acetate, vinylidene fluoride.
- Attacks most metals forming flammable hydrogen gas, and some plastics, rubbers and coatings.
- Reacts with zinc, brass, galvanised iron, aluminium, copper and copper alloys.

**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 p-complexes formed between chromium(0), vanadium(0) and other transition metals (haloarene-metal complexes) and mono- or poly-fluorobenzenes show extreme sensitivity to heat and are explosive.
- Avoid reaction with boronhydrides or cyanoborohydrides.
- Reacts with mild steel, galvanised steel / zinc producing hydrogen gas which may form an explosive mixture with air.
- Avoid strong acids, acid chlorides, acid anhydrides and chloroformates.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

**OCCUPATIONAL EXPOSURE LIMITS (OEL)**

**INGREDIENT DATA**

<table>
<thead>
<tr>
<th>Source</th>
<th>Ingredient</th>
<th>Material name</th>
<th>TWA</th>
<th>STEL</th>
<th>Peak</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>US OSHA Permissible Exposure Levels (PELs) - Table Z1</td>
<td>hydrochloric acid</td>
<td>Hydrogen chloride</td>
<td>Not Available</td>
<td>Not Available</td>
<td>7 mg/m³ / 5 ppm</td>
<td>TLV® Basis: URT irr</td>
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</table>

Continued...
EMERGENCY LIMITS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Material name</th>
<th>TEEL-1</th>
<th>TEEL-2</th>
<th>TEEL-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>hydrochloric acid</td>
<td>Hydrochloric acid (Hydrochloric acid)</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>hydrochloric acid</td>
<td>Deuterochloric acid; (Deuterium chloride)</td>
<td>1.8 ppm</td>
<td>22 ppm</td>
<td>100 ppm</td>
</tr>
<tr>
<td>antimony</td>
<td>Antimony</td>
<td>1.5 mg/m³</td>
<td>13 mg/m³</td>
<td>80 mg/m³</td>
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<tr>
<td>molybdenum</td>
<td>Molybdenum</td>
<td>30 mg/m³</td>
<td>330 mg/m³</td>
<td>2,000 mg/m³</td>
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<tr>
<td>potassium</td>
<td>Potassium</td>
<td>2.3 mg/m³</td>
<td>25 mg/m³</td>
<td>150 mg/m³</td>
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<tr>
<td>sodium carbonate</td>
<td>Sodium carbonate</td>
<td>7.6 mg/m³</td>
<td>83 mg/m³</td>
<td>500 mg/m³</td>
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</table>

Exposure controls

Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

The basic types of engineering controls are:

- Process controls which involve changing the way a job activity or process is done to reduce the risk.
- Enclosure and/or isolation of emission source which keeps a selected hazard “physically” away from the worker and ventilation that strategically “adds” and “removes” air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.
- Employers may need to use multiple types of controls to prevent employee overexposure.

Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection.

Appropriate engineering controls

Type of Contaminant: Air Speed:

- solvent, vapours, degreasing etc., evaporating from tank (in still air): 0.25-0.5 m/s (50-100 f/min.)
- aerosols, fumes from pouring operations, intermittent container filling, low speed conveyor transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation): 0.5-1 m/s (100-200 f/min.)
- direct spray, spray painting in shallow booths, drum filing, conveyor loading, crushing dusts, gas discharge (active generation into zone of rapid air motion): 1-2.5 m/s (200-500 f/min.)
- grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion): 2.5-10 m/s (500-2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range Upper end of the range
### Respiration protection

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

### 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.
- Select suitable gloves does 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 cannot be calculated in advance and has therefore to be checked prior to the application.
- The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.
- Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is always be taken into account to ensure selection of the most appropriate glove for the task.
- Glove thickness may also vary depending on the glove manufacturer, the glove type and the glove model. Therefore, manufacturers’ technical data should be used to determine the most appropriate glove for the task.
- The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.
- Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.
- Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:
  - frequency and duration of contact,
  - chemical resistance of glove material,
  - glove thickness and dexterity.
- Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent).
- When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
- When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.1 or national equivalent) is recommended.
- Some glove polymer types are less affected by movement and this should be taken into account when choosing gloves for long-term use.
- Contaminated gloves should be replaced.

For general applications, gloves with a thickness typically greater than 0.35 mm, are recommended.
- Thinner gloves (down to 0.1 mm or less) may be required where a high degree of manual dexterity is needed. However, these gloves are only likely to give short duration protection and would normally be just for single use applications, then disposed of.
- Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.

### Eye 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, wherever 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.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent]

### Personal protection

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Type of Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Room air currents minimal or favourable to capture</td>
</tr>
<tr>
<td>2</td>
<td>Contaminants of low toxicity or of nuisance value only</td>
</tr>
<tr>
<td>3</td>
<td>Intermittent, low production</td>
</tr>
<tr>
<td>4</td>
<td>Large hood or large air mass in motion</td>
</tr>
</tbody>
</table>

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (300-400 f/min) for extraction of solvents generated in a task 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocieties are multiplied by factors of 10 or more when extraction systems are installed or used.

### SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

#### Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

Continued...
### SECTION 10 STABILITY AND REACTIVITY

**Reactivity**
See section 7

**Chemical stability**
- Contact with alkaline material liberates heat

**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. The material has **not** been classified by EC Directives or other classification systems as “harmful by inhalation”. This is because of the lack of corroborating animal or human evidence. Bronchial and alveolar exudate are apparent in animals exposed to molybdenum by inhalation. Molybdenum fume may produce bronchial irritation and moderate fatty changes in liver and kidney. Hydrogen chloride (HCl) vapour or fumes present a hazard from a single acute exposure. Exposures of 1300 to 2000 ppm have been lethal to humans in a few minutes. Inhalation of HCl may cause choking, coughing, burning sensation and may cause ulceration of the nose, throat and larynx. Fluid on the lungs followed by generalised lung damage may follow. Breathing of HCl vapour may aggravate asthma and inflammatory or fibrotic pulmonary disease.

High concentrations cause necrosis of the tracheal and bronchial epithelium, pulmonary oedema, atelectasis and emphysema and damage to the pulmonary blood vessels and liver.

**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 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. Molybdenum, an essential trace element, can in large doses hamper growth and cause loss of appetite, listlessness and diarrhoea. Anaemia also occurs, and other symptoms include greying of hair, shrinking of the testicles, reduced fertility and milk production, shortness of breath, incoordination and irritation of the mucous membranes.

**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. 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.

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

**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. 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.
High levels of molybdenum can cause joint problems in the hands and feet with pain and lameness. Molybdenum compounds can also cause liver changes with elevated levels of enzymes and cause over-activity of the thyroid gland. There has been some concern that this material can cause cancer or mutations but there is not enough data to make an assessment.

Chronic minor exposure to hydrogen chloride (HCl) vapour or fume may cause discolouration or erosion of the teeth, bleeding of the nose and gums; and ulceration of the mucous membranes of the nose. Workers exposed to hydrochloric acid suffered from stomach inflammation and a number of cases of chronic bronchitis (airway inflammation) have also been reported. Repeated or prolonged exposure to dilute solutions of hydrogen chloride may cause skin inflammation.

<table>
<thead>
<tr>
<th>Compound</th>
<th>TOXICITY</th>
<th>IRRITATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrochloric acid</td>
<td>Inhalation (rat) LC50: 781 ppm/1hr[2]</td>
<td>Eye (rabbit): 5mg/30s - mild</td>
</tr>
<tr>
<td></td>
<td>Oral (rat) LD50: 900 mg/kg[2]</td>
<td></td>
</tr>
<tr>
<td>Aluminium</td>
<td>Oral (rat) LD50: &gt;2000 mg/kg[1]</td>
<td>Not Available</td>
</tr>
<tr>
<td>Antimony</td>
<td>Dermal (rabbit) LD50: &gt;8300 mg/kg[1]</td>
<td>Not Available</td>
</tr>
<tr>
<td>Chromium</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>Molybdenum</td>
<td>Dermal (rat) LD50: &gt;2000 mg/kg[1]</td>
<td>Not Available</td>
</tr>
<tr>
<td></td>
<td>Oral (rat) LD50: &gt;2000 mg/kg[1]</td>
<td></td>
</tr>
<tr>
<td>Potassium</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>Sodium carbonate</td>
<td>Dermal (rat) LD50: &gt;2000 mg/kg[2]</td>
<td>Eye (rabbit): 100 mg/24h moderate</td>
</tr>
<tr>
<td></td>
<td>Oral (rat) LD50: 2800 mg/kg*E</td>
<td>Eye (rabbit): 100 mg/30s mild</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eye (rabbit): 50 mg SEVERE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Skin (rabbit): 500 mg/24h mild</td>
</tr>
<tr>
<td>Water</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

**Legend:**
1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.
2. Value obtained from manufacturer’s SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of Chemical Substances.

**Hydrochloric Acid**
- For acid mists, aerosols, vapours.
- Tests suggest that eukaryotic cells are susceptible to genetic damage when the pH falls to about 6.5.
- The material may be irritating to the eye, with prolonged contact causing inflammation.

**Chromium**
- On skin and inhalation exposure, chromium and its compounds (except hexavalent) can be a potent sensitisers, as particulates.
- Tenth Annual Report on Carcinogens: Substance known to be Carcinogenic.
- National Toxicology Program: U.S. Dep. Gastrointestinal tumours, lymphoma, musculoskeletal tumours and tumours at site of application recorded.

**Sodium Carbonate**
- For sodium carbonate.
- Sodium carbonate has little potential for skin irritation, but is irritating to the eyes.
- 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.

**Hydrochloric Acid & Potassium & Sodium Carbonate**
- Asthma-like symptoms may continue for months or even years after exposure to the material ends.
No significant acute toxicological data identified in literature search.

HYDROCHLORIC ACID & ALUMINIUM & CHROMIUM & MOLYBDENUM & POTASSIUM & WATER

The substance is classified by IARC as Group 3: NOT classifiable as to its carcinogenicity to humans.

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

<table>
<thead>
<tr>
<th>ENDPOINT</th>
<th>TEST DURATION (HR)</th>
<th>SPECIES</th>
<th>VALUE</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50</td>
<td>96</td>
<td>Fish</td>
<td>70.057mg/L</td>
<td>3</td>
</tr>
<tr>
<td>EC50</td>
<td>96</td>
<td>Algae or other aquatic plants</td>
<td>344.947mg/L</td>
<td>3</td>
</tr>
<tr>
<td>EC50</td>
<td>9.33</td>
<td>Fish</td>
<td>0.014000mg/L</td>
<td>4</td>
</tr>
<tr>
<td>NOEC</td>
<td>0.08</td>
<td>Fish</td>
<td>10mg/L</td>
<td>4</td>
</tr>
<tr>
<td>LC50</td>
<td>96</td>
<td>Fish</td>
<td>0.078-0.108mg/L</td>
<td>2</td>
</tr>
<tr>
<td>EC50</td>
<td>48</td>
<td>Crustacea</td>
<td>0.7304mg/L</td>
<td>2</td>
</tr>
<tr>
<td>EC50</td>
<td>96</td>
<td>Algae or other aquatic plants</td>
<td>0.0054mg/L</td>
<td>2</td>
</tr>
<tr>
<td>BCF</td>
<td>360</td>
<td>Algae or other aquatic plants</td>
<td>9mg/L</td>
<td>4</td>
</tr>
<tr>
<td>EC50</td>
<td>120</td>
<td>Fish</td>
<td>0.000051mg/L</td>
<td>5</td>
</tr>
<tr>
<td>NOEC</td>
<td>72</td>
<td>Algae or other aquatic plants</td>
<td>&gt;=0.004mg/L</td>
<td>2</td>
</tr>
<tr>
<td>LC50</td>
<td>96</td>
<td>Fish</td>
<td>0.93mg/L</td>
<td>2</td>
</tr>
<tr>
<td>EC50</td>
<td>48</td>
<td>Crustacea</td>
<td>1mg/L</td>
<td>2</td>
</tr>
<tr>
<td>EC50</td>
<td>72</td>
<td>Algae or other aquatic plants</td>
<td>&gt;2.4mg/L</td>
<td>2</td>
</tr>
<tr>
<td>EC50</td>
<td>96</td>
<td>Crustacea</td>
<td>0.5mg/L</td>
<td>2</td>
</tr>
<tr>
<td>NOEC</td>
<td>720</td>
<td>Fish</td>
<td>&gt;0.0075mg/L</td>
<td>2</td>
</tr>
<tr>
<td>LC50</td>
<td>96</td>
<td>Fish</td>
<td>13.9mg/L</td>
<td>4</td>
</tr>
<tr>
<td>EC50</td>
<td>48</td>
<td>Crustacea</td>
<td>0.0225mg/L</td>
<td>5</td>
</tr>
<tr>
<td>EC50</td>
<td>72</td>
<td>Algae or other aquatic plants</td>
<td>0.104mg/L</td>
<td>4</td>
</tr>
<tr>
<td>BCF</td>
<td>1440</td>
<td>Algae or other aquatic plants</td>
<td>0.0495mg/L</td>
<td>4</td>
</tr>
<tr>
<td>EC50</td>
<td>48</td>
<td>Crustacea</td>
<td>0.0245mg/L</td>
<td>5</td>
</tr>
<tr>
<td>NOEC</td>
<td>672</td>
<td>Fish</td>
<td>0.00019mg/L</td>
<td>4</td>
</tr>
<tr>
<td>LC50</td>
<td>96</td>
<td>Fish</td>
<td>609.1mg/L</td>
<td>2</td>
</tr>
<tr>
<td>EC50</td>
<td>72</td>
<td>Algae or other aquatic plants</td>
<td>289.2mg/L</td>
<td>2</td>
</tr>
<tr>
<td>BCF</td>
<td>336</td>
<td>Algae or other aquatic plants</td>
<td>64mg/L</td>
<td>4</td>
</tr>
<tr>
<td>EC50</td>
<td>336</td>
<td>Algae or other aquatic plants</td>
<td>64mg/L</td>
<td>4</td>
</tr>
<tr>
<td>NOEC</td>
<td>672</td>
<td>Crustacea</td>
<td>0.67mg/L</td>
<td>2</td>
</tr>
</tbody>
</table>

Legend:
- Data available but does not fill the criteria for classification
- Data available to make classification
- Data Not Available to make classification
### Ecotoxicology:
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 Molybdenum:
Environmental Fate: Molybdenum is an essential micronutrient in plants and animals. It is commonly used in the manufacture of steel alloys. Based on the high concentration of molybdenum in all analyzed waste types, the exposure of the environment to molybdenum is regarded as significant. The limited amount of data regarding its toxicity makes it impossible to evaluate the potential for adverse environmental and health effects from molybdenum exposure. Molybdenum is generally found in two oxidation states in nature, Mo(IV) and Mo(VI). In oxidizing environments, Mo(VI) dominates and it is commonly present as molybdate. Natural molybdenum contains seven isotopes. Molybdenum oxidizes at elevated temperatures. Atmospheric Fate: Molybdenum can be deposited via dry/wet deposition; however, atmospheric exposure has been identified as a minor source to terrestrial and aquatic habitats.

### Persistence and degradability

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Persistence: Water/Soil</th>
<th>Persistence: Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>hydrochloric acid</td>
<td>LOW</td>
<td>LOW</td>
</tr>
<tr>
<td>sodium carbonate</td>
<td>LOW</td>
<td>LOW</td>
</tr>
<tr>
<td>water</td>
<td>LOW</td>
<td>LOW</td>
</tr>
</tbody>
</table>

### Bioaccumulative potential

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Bioaccumulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>hydrochloric acid</td>
<td>LOW (LogKOW = 0.5392)</td>
</tr>
<tr>
<td>sodium carbonate</td>
<td>LOW (LogKOW = -0.4605)</td>
</tr>
<tr>
<td>water</td>
<td>LOW (LogKOW = -1.38)</td>
</tr>
</tbody>
</table>

### Mobility in soil

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>hydrochloric acid</td>
<td>LOW (KOC = 14.3)</td>
</tr>
<tr>
<td>sodium carbonate</td>
<td>HIGH (KOC = 1)</td>
</tr>
<tr>
<td>water</td>
<td>LOW (KOC = 14.3)</td>
</tr>
</tbody>
</table>

### SECTION 13 DISPOSAL CONSIDERATIONS

### Waste treatment methods

- 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

### Legend:
- Extracted from: 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data
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. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. 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.

- 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: 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).
- Decontaminate empty containers with 5% aqueous sodium hydroxide or soda ash, followed by water. Observe all label safeguards until containers are cleaned and destroyed.

### SECTION 14 TRANSPORT INFORMATION

#### Labels Required

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marine Pollutant</td>
<td>NO</td>
</tr>
</tbody>
</table>

#### Land transport (DOT)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>1789</td>
</tr>
<tr>
<td>UN proper shipping name</td>
<td>Hydrochloric acid (contains hydrochloric acid)</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>Class 8, Subrisk Not Applicable</td>
</tr>
<tr>
<td>Packing group</td>
<td>II</td>
</tr>
<tr>
<td>Environmental hazard</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Special precautions for user</td>
<td>Hazard Label 8, Special provisions 386, A3, A6, B3, B15, B133, B82, N41, T8, TP2</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>1789</td>
</tr>
<tr>
<td>UN proper shipping name</td>
<td>Hydrochloric acid (contains hydrochloric acid)</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>ICAO/IATA Class 8, ICAO / IATA Subrisk Not Applicable</td>
</tr>
<tr>
<td>ERG Code</td>
<td>8L</td>
</tr>
<tr>
<td>Packing group</td>
<td>II</td>
</tr>
<tr>
<td>Environmental hazard</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Special precautions for user</td>
<td>Special provisions A3A803, Cargo Only Packing Instructions 855, Cargo Only Maximum Qty / Pack 30 L, Passenger and Cargo Packing Instructions 851, Passenger and Cargo Maximum Qty / Pack 1 L, Passenger and Cargo Limited Quantity Packing Instructions Y840, Passenger and Cargo Limited Maximum Qty / Pack 0.5 L</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>1789</td>
</tr>
<tr>
<td>UN proper shipping name</td>
<td>HYDROCHLORIC ACID (contains hydrochloric acid)</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>IMDG Class 8, IMDG Subrisk Not Applicable</td>
</tr>
<tr>
<td>Packing group</td>
<td>II</td>
</tr>
</tbody>
</table>
Environmental hazard | Not Applicable
---|---
Special precautions for use<br>EMS Number | F-A, S-B<br>Special provisions | Not Applicable<br>Limited Quantities | 1 L

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

<table>
<thead>
<tr>
<th>Source</th>
<th>Product name</th>
<th>Pollution Category</th>
<th>Ship Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMO MARPOL (Annex II) - List of Noxious Liquid Substances Carried in Bulk</td>
<td>Hydrochloric acid</td>
<td>Z</td>
<td>3</td>
</tr>
</tbody>
</table>

SECTION 15 REGULATORY INFORMATION

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

**HYDROCHLORIC ACID(6574-01-0) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

- International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
- US - Alaska Limits for Air Contaminants
- US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs)
- US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)
- US - California Permissible Exposure Limits for Chemical Contaminants
- US - Hawaii Air Contaminant Limits
- US - Idaho - Limits for Air Contaminants
- US - Massachusetts - Right To Know Listed Chemicals
- US - Michigan Exposure Limits for Air Contaminants
- US - Minnesota Permissible Exposure Limits (PELSs)
- US - Oregon Permissible Exposure Limits (Z-1)
- US - Pennsylvania - Hazardous Substance List
- US - Rhode Island Hazardous Substance List
- US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
- US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants

**ALUMINIUM(7429-90-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

- US - Alaska Limits for Air Contaminants
- US - California Permissible Exposure Limits for Chemical Contaminants
- US - Hawaii Air Contaminant Limits
- US - Massachusetts - Right To Know Listed Chemicals
- US - Michigan Exposure Limits for Air Contaminants
- US - Minnesota Permissible Exposure Limits (PELSs)
- US - Oregon Permissible Exposure Limits (Z-1)
- US - Pennsylvania - Hazardous Substance List
- US - Rhode Island Hazardous Substance List
- US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
- US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants

**ANTIMONY(7440-36-0) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

- US - Alaska Limits for Air Contaminants
- US - California Permissible Exposure Limits for Chemical Contaminants
- US - Hawaii Air Contaminant Limits
- US - Idaho - Limits for Air Contaminants
- US - Massachusetts - Right To Know Listed Chemicals
- US - Michigan Exposure Limits for Air Contaminants
- US - Minnesota Permissible Exposure Limits (PELSs)
- US - Oregon Permissible Exposure Limits (Z-1)
- US - Pennsylvania - Hazardous Substance List
- US - Rhode Island Hazardous Substance List
- US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
- US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants

**CHROMIUM(7440-47-3) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

- US - Alaska Limits for Air Contaminants
- US - California Permissible Exposure Limits for Chemical Contaminants
- US - Hawaii Air Contaminant Limits
- US - Idaho - Limits for Air Contaminants
- US - Massachusetts - Right To Know Listed Chemicals
- US - Michigan Exposure Limits for Air Contaminants
- US - Minnesota Permissible Exposure Limits (PELSs)
- US - Oregon Permissible Exposure Limits (Z-1)
- US - Pennsylvania - Hazardous Substance List
- US - Rhode Island Hazardous Substance List
- US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
- US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants

Continued...
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

US - Alaska Limits for Air Contaminants
US - California Permissible Exposure Limits for Chemical Contaminants
US - Hawaii Air Contaminant Limits
US - Idaho - Limits for Air Contaminants
US - Massachusetts - Right To Know Listed Chemicals
US - Michigan Exposure Limits for Air Contaminants
US - Oregon Permissible Exposure Limits (Z-1)
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants

MOLYBDENUM (7439-98-7) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - Alaska Limits for Air Contaminants
US - Hawaii Air Contaminant Limits
US - Idaho - Limits for Air Contaminants
US - Massachusetts - Right To Know Listed Chemicals
US - Minnesota Permissible Exposure Limits (PELs)
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants

POTASSIUM (7440-09-7) IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Air Transport Association (IATA) Dangerous Goods Regulations - Prohibited List
US - Massachusetts - Right To Know Listed Chemicals
US - Pennsylvania - Hazardous Substance List

SODIUM CARBONATE (497-19-8) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - Pennsylvania - Hazardous Substance List

WATER (7732-18-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - Pennsylvania - Hazardous Substance List

Federal Regulations
Superfund Amendments and Reauthorization Act of 1986 (SARA)

SECTION 311/312 HAZARD CATEGORIES

Immediate (acute) health hazard: Yes
Delayed (chronic) health hazard: No
Fire hazard: No
Pressure hazard: No
Reactivity hazard: No

US. EPA CERCLA HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES (40 CFR 302.4)

<table>
<thead>
<tr>
<th>Name</th>
<th>Reportable Quantity in Pounds (lb)</th>
<th>Reportable Quantity in kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrochloric acid</td>
<td>5000</td>
<td>2270</td>
</tr>
<tr>
<td>Antimony</td>
<td>5000</td>
<td>2270</td>
</tr>
<tr>
<td>Chromium</td>
<td>5000</td>
<td>2270</td>
</tr>
</tbody>
</table>

State Regulations
US. CALIFORNIA PROPOSITION 65
None Reported

National Inventory Status

<table>
<thead>
<tr>
<th>Country</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia - AICS</td>
<td>Y</td>
</tr>
<tr>
<td>Canada - DSL</td>
<td>Y</td>
</tr>
<tr>
<td>Canada - NDSSL</td>
<td>N</td>
</tr>
<tr>
<td>China - IEOCS</td>
<td>Y</td>
</tr>
<tr>
<td>Europe - ENICE / ELINCS / NLP</td>
<td>Y</td>
</tr>
<tr>
<td>Japan - ENCS</td>
<td>N</td>
</tr>
<tr>
<td>Korea - KECI</td>
<td>Y</td>
</tr>
<tr>
<td>New Zealand - NZIoC</td>
<td>Y</td>
</tr>
<tr>
<td>Philippines - PICCS</td>
<td>Y</td>
</tr>
<tr>
<td>USA - TSCA</td>
<td>Y</td>
</tr>
</tbody>
</table>

Legend:
Y = All ingredients are on the inventory
N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing (see specific ingredients in brackets)

Continued...
SECTION 16 OTHER INFORMATION

Other information

Ingredients with multiple cas numbers

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS No</th>
</tr>
</thead>
<tbody>
<tr>
<td>aluminium</td>
<td>7429-90-5, 91728-14-2</td>
</tr>
<tr>
<td>sodium carbonate</td>
<td>497-19-8, 7542-12-3, 1314087-39-2, 1332-57-6</td>
</tr>
</tbody>
</table>

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

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

Definitions and abbreviations

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

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