## SECTION 1 IDENTIFICATION

### Product Identifier

<table>
<thead>
<tr>
<th>Product name</th>
<th>Interference Check Standard 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonyms</td>
<td>INFCS-4</td>
</tr>
<tr>
<td>Proper shipping name</td>
<td>Corrosive liquid, acidic, inorganic, n.o.s. (contains nitric acid)</td>
</tr>
<tr>
<td>Other means of</td>
<td>INFCS-4</td>
</tr>
<tr>
<td>identification</td>
<td></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

**Registered company name**

High-Purity Standards

**Address**

PO Box 41727 SC 29423 United States

**Telephone**

843-767-7900

**Fax**

843-767-7906

**Website**

highpuritystandards.com

**Email**

Not Available

### Emergency phone number

**Association / Organisation**

INFOTRAC

**Emergency telephone numbers**

1-800-535-5053

**Other emergency telephone numbers**

1-352-323-3500

## SECTION 2 HAZARD(S) IDENTIFICATION

### Classification of the substance or mixture

**Classification**

Serious Eye Damage Category 1, Metal Corrosion Category 1, Skin Corrosion/Initiation Category 1A

### Label elements

**Hazard pictogram(s)**

![Hazard Pictogram]

**SIGNAL WORD**

DANGER

### 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>7732-18-5</td>
<td>balance</td>
<td>water</td>
</tr>
<tr>
<td>7697-37-2</td>
<td>5</td>
<td>nitric acid</td>
</tr>
<tr>
<td>7429-90-5</td>
<td>0.5</td>
<td>aluminium</td>
</tr>
<tr>
<td>7440-70-2</td>
<td>0.5</td>
<td>calcium</td>
</tr>
<tr>
<td>7439-89-6</td>
<td>0.5</td>
<td>iron</td>
</tr>
<tr>
<td>13446-18-9</td>
<td>0.5 (as Mg)</td>
<td>magnesium nitrate</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.

(ISC13719)

**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 oedema and inhalation exposure. Treat with 100% oxygen initially.
- Respiratory distress may require cricoidotomy 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 desiccating action of the acid on proteins in specific tissues.

**INGESTION:**
- Immediate dilution (milk or water) within 30 minutes post ingestion is recommended.

**Continued...**
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 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.
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 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.
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.

Other information
- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
### Conditions for safe storage, including any incompatibilities

**Suitable container**
- DO NOT use aluminium or galvanised containers
- Check regularly for splits and leaks
- Lined metal can, lined metal pail/ can.
- Plastic pail.
- 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 C 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**
- 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.
- 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 violently with vinyl acetate.

For aluminas (aluminium oxide):
- Incompatible with hot chlorinated rubber.
- Incompatible with halogenated hydrocarbons (eg. CFCs, HCFCs)
- Incompatible with strong bases (e.g. sodium hydroxide, potassium hydroxide, sodium metasilicate and sodium carbonate).
- 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 violently with vinyl acetate.

### SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

**OCCUPATIONAL EXPOSURE LIMITS (OEL)**

<table>
<thead>
<tr>
<th>Source/Exposure Limits</th>
<th>Ingredient</th>
<th>Material name</th>
<th>TWA (mg/m³ / ppm)</th>
<th>STEL (mg/m³ / ppm)</th>
<th>Peak</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>US OSHA Permissible Exposure Levels (PELs) - Table Z1</td>
<td>nitric acid</td>
<td>Nitric acid</td>
<td>5 (total), 5</td>
<td>10 (total), 10</td>
<td>Not Available</td>
<td>TLV® Basis: URT &amp; eye irr; dental erosion</td>
</tr>
<tr>
<td>US NIOSH Recommended Exposure Limits (RELs)</td>
<td>nitric acid</td>
<td>Aqua fortis, Engravers acid, Hydrogen nitrate, Red fuming nitric acid (RFNA), White fuming nitric acid (WFNA)</td>
<td>5 (total), 5</td>
<td>10 (total), 10</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>US ACGIH Threshold Limit Values (TLV)</td>
<td>nitric acid</td>
<td>Nitric acid</td>
<td>2 ppm</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>US OSHA Permissible Exposure Levels (PELs) - Table Z1</td>
<td>aluminium</td>
<td>Aluminum, metal</td>
<td>15 mg/m³</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Total dust; (as Al)</td>
</tr>
<tr>
<td>US OSHA Permissible Exposure Levels (PELs) - Table Z1</td>
<td>aluminium</td>
<td>Aluminum, metal- Respirable fraction</td>
<td>5 mg/m³</td>
<td>Not Available</td>
<td>Not Available</td>
<td>(as Al)</td>
</tr>
<tr>
<td>US NIOSH Recommended Exposure Limits (RELs)</td>
<td>aluminium</td>
<td>Aluminum, Aluminum metal, Aluminum powder, Elemental aluminum</td>
<td>10 (total), 5 (resp) mg/m³</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

**EMERGENCY LIMITS**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Material name</th>
<th>TEEL-1</th>
<th>TEEL-2</th>
<th>TEEL-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>nitric acid</td>
<td>Nitric acid</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>iron</td>
<td>Iron</td>
<td>32 mg/m³</td>
<td>35 mg/m³</td>
<td>150 mg/m³</td>
</tr>
<tr>
<td>magnesium nitrate</td>
<td>Magnesium(II) nitrate (1:2), hexahydrate</td>
<td>16 mg/m³</td>
<td>180 mg/m³</td>
<td>1,100 mg/m³</td>
</tr>
</tbody>
</table>
magnesium nitrate | Magnesium nitrate; (Magnesium(II) nitrate (1:2)) | 30 mg/m³ | 330 mg/m³ | 2,000 mg/m³
---|---|---|---|---
Ingredient | Original IDLH | Revised IDLH | Not Available | Not Available | Not Available
water | Not Available | Not Available | Not Available | Not Available | Not Available
nitric acid | 100 ppm | 25 ppm | Not Available | Not Available | Not Available
calcium | Not Available | Not Available | Not Available | Not Available | Not Available
iron | Not Available | Not Available | Not Available | Not Available | Not Available
magnesium nitrate | Not Available | Not Available | Not Available | Not Available | Not Available

**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. An approved self contained breathing apparatus (SCBA) may be required in some situations. Provide adequate ventilation in warehouse or closed storage area. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

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

Within each range the appropriate value depends on:

<table>
<thead>
<tr>
<th>Lower end of the range</th>
<th>Upper end of the range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Room air currents minimal or favourable to capture</td>
<td>1: Disturbing room air currents</td>
</tr>
<tr>
<td>2: Contaminants of low toxicity or of nuisance value only</td>
<td>2: Contaminants of high toxicity</td>
</tr>
<tr>
<td>3: Intermittent, low production.</td>
<td>3: High production, heavy use</td>
</tr>
<tr>
<td>4: Large hood or large air mass in motion</td>
<td>4: Small hood-local control only</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 the distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min) for extraction of aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation).

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

**Eye and face protection**

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

**Body protection**

See Other protection below

**Other protection**

- Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.
- Ensure there is ready access to a safety shower.
**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>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Odour</td>
<td>Not Available</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>Not Available</td>
</tr>
<tr>
<td>pH (as supplied)</td>
<td>&lt;2</td>
</tr>
<tr>
<td>Melting point / freezing point</td>
<td>Not Available</td>
</tr>
<tr>
<td>Initial boiling point and boiling range (°C)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Flash point (°C)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not Available</td>
</tr>
<tr>
<td>Flammability</td>
<td>Not Available</td>
</tr>
<tr>
<td>Upper Explosive Limit (%)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Lower Explosive Limit (%)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Vapour pressure (kPa)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Solubility in water (g/L)</td>
<td>Miscible</td>
</tr>
<tr>
<td>Vapour density (Air = 1)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Appearance</td>
<td>colorless</td>
</tr>
<tr>
<td>Relative density (Water = 1)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Partition coefficient n-octanol / water</td>
<td>Not Available</td>
</tr>
<tr>
<td>Auto-ignition temperature (°C)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not Available</td>
</tr>
<tr>
<td>Molecular weight (g/mol)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Taste</td>
<td>Not Available</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Not Available</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>Not Available</td>
</tr>
<tr>
<td>Surface Tension (dyn/cm or mN/m)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Viscosity (cSt)</td>
<td>Not Available</td>
</tr>
<tr>
<td>VOC g/L</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

**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.

**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.

**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 bloodstream, 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.
Interference Check Standard 4

<table>
<thead>
<tr>
<th>Substance</th>
<th>TOXICITY</th>
<th>IRRITATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>water</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>nitric acid</td>
<td>Tox (rat) LC50: 625 ppm/1h&lt;sup&gt;[2]&lt;/sup&gt;</td>
<td>Not Available</td>
</tr>
<tr>
<td>aluminium</td>
<td>Oral (rat) LD50: &gt;2000 mg/kg&lt;sup&gt;[1]&lt;/sup&gt;</td>
<td>Not Available</td>
</tr>
<tr>
<td>calcium</td>
<td>Dermal (rabbit) LD50: &gt;2500 mg/kg&lt;sup&gt;[1]&lt;/sup&gt;</td>
<td>Not Available</td>
</tr>
<tr>
<td>iron</td>
<td>Oral (rat) LD50: 98600 mg/kg&lt;sup&gt;[2]&lt;/sup&gt;</td>
<td>Not Available</td>
</tr>
<tr>
<td>magnesium nitrate</td>
<td>Oral (rat) LD50: 5440 mg/kg&lt;sup&gt;[2]&lt;/sup&gt;</td>
<td>Eye (rabbit): 500 mg/24h - mild</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Skin (rabbit): 500 mg/24h - mild</td>
</tr>
</tbody>
</table>

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

**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.
The material may produce severe irritation to the eye causing pronounced inflammation.
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.
Oral (?) LD50: 50-500 mg/kg * [Various Manufacturers]

**CALCIUM**
The solid may react violently on contact with wet skin tissue, i.e. eyes, mouth, causing chemical and thermal burns. The acute effects include burns, ulceration, or tissue death, severe eye damage (corneal burns or opacification), and probable blindness. Inhalation of dust or fumes (especially from a fire involving calcium) will cause shortness of breath, nausea, headache, nose and respiratory tract irritation and in extreme, pneumonitis.

**MAGNESIUM NITRATE**
The material may be irritating to the eye, with prolonged contact causing inflammation.
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.
Magnesium nitrate hexahydrate is a methaemoglobin-forming agent which if inhaled or ingested in high enough concentrations may cause fatigue, headache, dizziness. (Source: I.L.O. Encyclopaedia)

**WATER & ALUMINIUM & CALCIUM**
No significant acute toxicological data identified in literature search.

**NITRIC ACID & CALCIUM**
Asthma-like symptoms may continue for months or even years after exposure to the material ends.

### Acute Toxicity
- Skin Irritation/Corrosion: ✔
- Serious Eye Damage/Irritation: ✔
- Respiratory or Skin sensitisation: ❌
- Mutagenicity: ❌

### Carcinogenicity
- Reproductivity: ❌
- STOT - Single Exposure: ❌
- STOT - Repeated Exposure: ❌
- Aspiration Hazard: ❌

**Legend:**
- ✔ Data available but does not fill the criteria for classification
- ✔ Data available to make classification
- ❌ Data Not Available to make classification

---

### SECTION 12 ECOLOGICAL INFORMATION

**Toxicity**

<table>
<thead>
<tr>
<th>Interference Check Standard 4</th>
<th>ENDPOINT</th>
<th>TEST DURATION (HR)</th>
<th>SPECIES</th>
<th>VALUE</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>
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

Prevent, by any means available, spillage from entering drains or water courses. **DO NOT** discharge into sewer or waterways.

### Persistence and degradability

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Persistence: Water/Soil</th>
<th>Persistence: Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>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>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>water</td>
<td>LOW (KOC = 14.3)</td>
</tr>
</tbody>
</table>

### SECTION 13 DISPOSAL CONSIDERATIONS

**Waste treatment methods**

- 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**

- Marine Pollutant: NO

#### Land transport (DOT)

- **UN number:** 3264
- **UN proper shipping name:** Corrosive liquid, acidic, inorganic, n.o.s. (contains nitric acid)
- **Transport hazard class(es):**
  - Class 8
  - Subrisk Not Applicable
- **Packing group:** II
- **Environmental hazard:** Not Applicable
- **Special precautions for user:**
  - Hazard Label: 8
  - Special provisions: 386, B2, B3, T11, TP2, TP27

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

- **UN number:** 3264
- **UN proper shipping name:** Corrosive liquid, acidic, inorganic, n.o.s. * (contains nitric acid)
- **Transport hazard class(es):**
  - ICAO/IATA Class 8
  - ICAO / IATA Subrisk Not Applicable
  - ERG Code 8L
- **Packing group:** II
<table>
<thead>
<tr>
<th>Environmental hazard</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special precautions for user</td>
<td><strong>A3A803</strong></td>
</tr>
<tr>
<td>Special provisions</td>
<td>Cargo Only Packing Instructions 865</td>
</tr>
<tr>
<td>Cargo Only Maximum Qty / Pack</td>
<td>30 L</td>
</tr>
<tr>
<td>Passenger and Cargo Packing Instructions</td>
<td>861</td>
</tr>
<tr>
<td>Passenger and Cargo Maximum Qty / Pack</td>
<td>1 L</td>
</tr>
<tr>
<td>Passenger and Cargo Limited Quantity Packing Instructions</td>
<td>YB40</td>
</tr>
<tr>
<td>Passenger and Cargo Limited Maximum Qty / Pack</td>
<td>0.5 L</td>
</tr>
</tbody>
</table>

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

| UN number | 3864 |
| UN proper shipping name | CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (contains nitric acid) |
| Transport hazard class(es) | IMDG Class: 8 |
| IMDG Subrisk | Not Applicable |

**Environmental hazard**

| Not Applicable |
| Special precautions for user | **F-A, S-B** |
| Special provisions | 274 |
| 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>Nitric acid (70% and over)/Nitric acid (less than 70%)</td>
<td>Y, Y</td>
<td>2/2</td>
</tr>
</tbody>
</table>

## SECTION 15 REGULATORY INFORMATION

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

**WATER/7732-18-5** IS FOUND ON THE FOLLOWING REGULATORY LISTS

- US - Pennsylvania - Hazardous Substance List
- US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

**NITRIC ACID (7697-37-2)** IS FOUND ON THE FOLLOWING REGULATORY LISTS

- International Air Transport Association (IATA) Dangerous Goods Regulations - Prohibited List
- Passenger and Cargo Aircraft
- US - Alaska Limits for Air Contaminants
- US - California OEHHA/ABR - Acute Reference Exposure Levels and Target Organs (RELs)
- 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 (PELs)
- 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 Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

**ALUMINUM (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 (PELs)
- 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
- US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

**CALCIUM (7440-70-2)** IS FOUND ON THE FOLLOWING REGULATORY LISTS

- US - Massachusetts - Right To Know Listed Chemicals
- US - Pennsylvania - Hazardous Substance List
- US - Rhode Island Hazardous Substance List
- US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

**Continued...**
IRON(7439-89-6) IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
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 - Michigan Exposure Limits for Air Contaminants

MAGNESIUM NITRATE(13446-18-9) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - Massachusetts - Right To Know Listed Chemicals
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US EPCRA Section 313 Chemical List
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

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>Nitric acid</td>
<td>1000</td>
<td>454</td>
</tr>
</tbody>
</table>

State Regulations

US. CALIFORNIA PROPOSITION 65
None Reported

National Inventory Status
Australia - AICS Y
Canada - DSL Y
Canada - NDSL N (calcium; magnesium nitrate; water; aluminium; iron; nitric acid)
China - IECSC Y
Europe - EINEC / ELINCS / NLP Y
Japan - ENCS N (calcium; magnesium nitrate; water; aluminium; iron; nitric acid)
Korea - KECI Y
New Zealand - NZIoC Y
Philippines - PICCS Y
USA - TSCA Y

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)

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, 91729-14-2</td>
</tr>
<tr>
<td>calcium</td>
<td>7440-70-2, 8047-59-4</td>
</tr>
<tr>
<td>magnesium nitrate</td>
<td>13446-18-9, 10377-60-3, 10213-15-7</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

Continued...