

# 1102/78 BOSS PICKLING GEL

Chemwatch Material Safety Data Sheet  
Issue Date: 15-Apr-2008  
NC317ECP

CHEMWATCH 4691-52  
Version No:2.0  
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## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT NAME

1102/78 BOSS PICKLING GEL

### PROPER SHIPPING NAME

CORROSIVE LIQUID, TOXIC, N.O.S.  
contains hydrofluoric acid and nitric acid

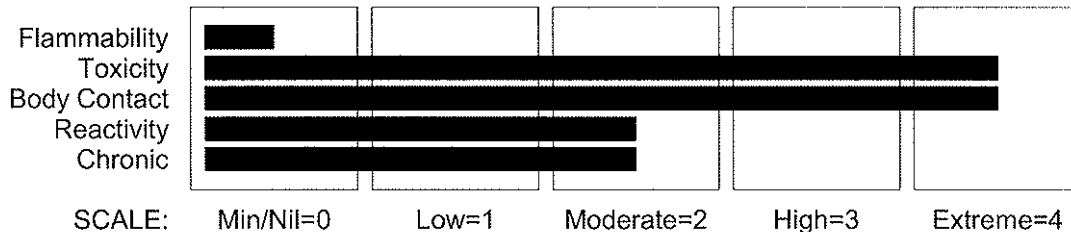
### PRODUCT USE

Stainless steel weld scale remover.

### SUPPLIER

Company: Dynaweld Industrial Supplies Pty Ltd  
Address:  
Rear 123, Fairford Road  
Padstow  
NSW, 2211  
AUS  
Telephone: +61 2 9772 1144  
Fax: +61 2 9774 1685

### HAZARD RATINGS



## Section 2 - HAZARDS IDENTIFICATION

### STATEMENT OF HAZARDOUS NATURE

**HAZARDOUS SUBSTANCE. DANGEROUS GOODS.** According to the Criteria of NOHSC,  
and the ADG Code.

### POISONS SCHEDULE

S7

#### RISK

Very toxic by inhalation in contact with  
skin and if swallowed.  
Causes severe burns.  
Risk of serious damage to eyes.

#### SAFETY

Keep locked up.

Avoid contact with eyes.  
Wear suitable protective clothing.  
In case of insufficient ventilation wear  
suitable respiratory equipment.  
To clean the floor and all objects  
contaminated by this material use water.  
This material and its container must be  
disposed of in a safe way.  
Keep away from food drink and animal  
feeding stuffs.

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## Section 2 - HAZARDS IDENTIFICATION

Take off immediately all contaminated clothing.  
In case of accident or if you feel unwell IMMEDIATELY contact Doctor or Poisons Information Centre (show label if possible).  
This material and its container must be disposed of as hazardous waste.  
In case of accident by inhalation: remove casualty to fresh air and keep at rest.

## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
nitric acid	7697-37-2	10-30
hydrofluoric acid	7664-39-3	<10
performance additives		10-30
water	7732-18-5	30-60

NOTE: Manufacturer has supplied full ingredient information to allow CHEMWATCH assessment.

## Section 4 - FIRST AID MEASURES

### SWALLOWED

DO NOT delay. Rinse mouth out with plenty of water.  
Transport to hospital or doctor and seek immediate medical attention.  
DO NOT INDUCE vomiting.  
If patient is conscious, give six calcium gluconate or calcium carbonate tablets dissolved in water, by mouth.

### EYE

DO NOT delay.  
If this product or its vapours come in contact with the eyes,  
· DO NOT DELAY: Immediately irrigate continuously by holding the eyelids apart and washing with fresh 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, eye clinic or eye specialist, ophthalmologist without delay.

### SKIN

DO NOT delay.  
If there is evidence of severe skin irritation or skin burns:  
· Avoid further contact. Immediately remove contaminated clothing, including footwear.  
· Flush skin under running water for 15 minutes.  
· Avoiding contamination of the hands, massage calcium gluconate gel into affected areas, pay particular attention to creases in skin.  
· Contact the Poisons Information Centre.  
· Continue gel application for at least 15 minutes after burning sensation ceases.  
· If pain recurs, repeat application of calcium gluconate gel or apply every 20 minutes.  
· If no gel is available, continue washing for at least 15 minutes, using soap if available. If patient is conscious, give six calcium gluconate or calcium carbonate tablets in water by mouth.  
· Transport to hospital, or doctor, urgently.

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Section 4 - FIRST AID MEASURES

## INHALED

For massive exposures:

- If dusts, vapours, aerosols, 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.
- If victim is conscious, give six calcium gluconate or calcium carbonate tablets in water by mouth.
- Transport to hospital, or doctor, urgently.

## NOTES TO PHYSICIAN

Following acute or short term repeated exposure to hydrofluoric acid:

- Subcutaneous injections of Calcium Gluconate may be necessary around the burnt area. Continued application of Calcium Gluconate Gel or subcutaneous Calcium Gluconate should then continue for 3-4 days at a frequency of 4-6 times per day. If a "burning" sensation recurs, apply more frequently.
- Systemic effects of extensive hydrofluoric acid burns include renal damage, hypocalcaemia and consequent cardiac arrhythmias. Monitor haematological, respiratory, renal, cardiac and electrolyte status at least daily. Tests should include FBE, blood gases, chest X-ray, creatinine and electrolytes, urine output, Ca ions, Mg ions and phosphate ions. Continuous ECG monitoring may be required.
- Where serum calcium is low, or clinical, or ECG signs of hypocalcaemia develop, infusions of calcium gluconate, or if less serious, oral Sandocal, should be given. Hydrocortisone 500 mg in a four to six hourly infusion may help.
- Antibiotics should not be given as a routine, but only when indicated.
- Eye contact pain may be excruciating and 2-3 drops of 0.05% pentocaine hydrochloride may be instilled, followed by further irrigation

### BIOLOGICAL EXPOSURE INDEX - BEI

These represent the determinants observed in specimens collected from a healthy worker exposed at the Exposure Standard (ES or TLV):

Determinant	Index	Sampling Time	Comments
1. Methaemoglobin in blood	1.5% of haemoglobin	During or end of shift	B, NS, SQ

B: Background levels occur in specimens collected from subjects NOT exposed.

NS: Non-specific determinant; Also seen after exposure to other materials

SQ: Semi-quantitative determinant - Interpretation may be ambiguous; should be used as a screening test or confirmatory test.

## Section 5 - FIRE FIGHTING MEASURES

### EXTINGUISHING MEDIA

- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.
- Water spray or fog - Large fires only.

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Section 5 - FIRE FIGHTING MEASURES

## FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
  - Wear full body protective clothing with breathing apparatus.
  - Consider evacuation (or protect in place).
  - Use water delivered as a fine spray to control fire and cool adjacent area.
  - DO NOT approach containers suspected to be hot.
  - Cool fire exposed containers with water spray from a protected location.
  - If safe to do so, remove containers from path of fire.
  - Equipment should be thoroughly decontaminated after use.
- When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 800 metres in all directions.

## FIRE/EXPLOSION HAZARD

- Non combustible.
  - Not considered to be a significant fire risk.
  - Acids may react with metals to produce hydrogen, a highly flammable and explosive gas.
  - Heating may cause expansion or decomposition leading to violent rupture of containers.
  - Decomposes on heating and may produce toxic fumes of carbon monoxide (CO).
  - May emit acrid smoke. May emit corrosive fumes.
- Other decomposition products include: carbon dioxide (CO<sub>2</sub>), hydrogen fluoride and nitrogen oxides (NO<sub>x</sub>).

## FIRE INCOMPATIBILITY

- Avoid any contamination of this material as it is very reactive and any contamination is potentially hazardous.
- Avoid reaction with: organic materials / compounds, powdered metals, reducing agents and hydrogen sulfide (H<sub>2</sub>S) as ignition may result.
- Reacts with mild steel, galvanised steel / zinc producing hydrogen gas which may form an explosive mixture with air.

HAZCHEM: 2XE

## Personal Protective Equipment

Gas tight chemical resistant suit.

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## Section 6 - ACCIDENTAL RELEASE MEASURES

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## EMERGENCY PROCEDURES

### MINOR SPILLS

- DO NOT touch the spill material.
- Clean up all spills immediately.
- Avoid breathing vapours and contact with skin and eyes.
- Wear impervious gloves and safety glasses.
- Use soda ash or slaked lime to neutralise.
- Trowel up/scrape up.
- Place spilled material in clean, dry, sealable, labelled container.
- Flush spill area with water.

### MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Consider evacuation (or protect in place).
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.

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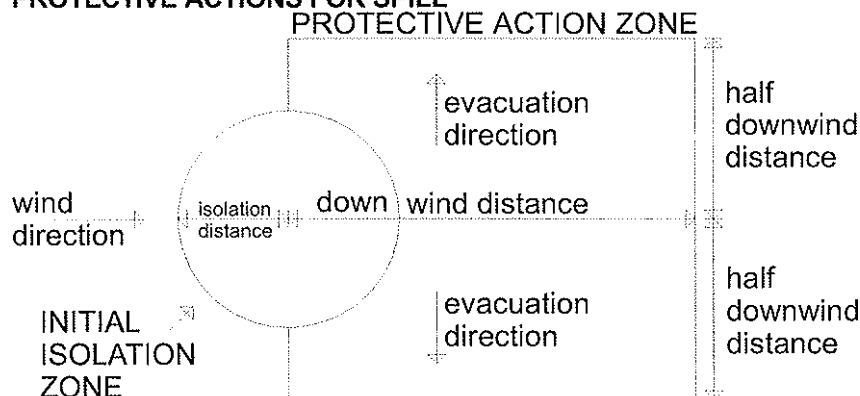
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## Section 6 - ACCIDENTAL RELEASE MEASURES

- Collect recoverable product into labelled containers for recycling.
- Neutralise/decontaminate residue.
- Collect solid residues and seal in labelled drums for disposal.
- Wash area and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.

### PROTECTIVE ACTIONS FOR SPILL



From IERG (Canada/Australia)

Isolation Distance	25 metres
Downwind Protection Distance	250 metres
IERG Number	37

### FOOTNOTES

- 1 PROTECTIVE ACTION ZONE is defined as the area in which people are at risk of harmful exposure. This zone assumes that random changes in wind direction confines the vapour plume to an area within 30 degrees on either side of the predominant wind direction, resulting in a crosswind protective action distance equal to the downwind protective action distance.
- 2 PROTECTIVE ACTIONS should be initiated to the extent possible, beginning with those closest to the spill and working away from the site in the downwind direction. Within the protective action zone a level of vapour concentration may exist resulting in nearly all unprotected persons becoming incapacitated and unable to take protective action and/or incurring serious or irreversible health effects.
- 3 INITIAL ISOLATION ZONE is determined as an area, including upwind of the incident, within which a high probability of localised wind reversal may expose nearly all persons without appropriate protection to life-threatening concentrations of the material.
- 4 SMALL SPILLS involve a leaking package of 200 litres (55 US gallons) or less, such as a drum (jerrican or box with inner containers). Larger packages leaking less than 200 litres and compressed gas leaking from a small cylinder are also considered "small spills".  
LARGE SPILLS involve many small leaking packages or a leaking package of greater than 200 litres, such as a cargo tank, portable tank or a "one-tonne" compressed gas cylinder.
- 5 Guide 154 is taken from the US DOT emergency response guide book.
- 6 IERG information is derived from CANUTEC - Transport Canada.

### EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:

nitric acid 78ppm

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

nitric acid 6ppm

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## Section 6 - ACCIDENTAL RELEASE MEASURES

other than mild, transient adverse effects without perceiving a clearly defined odour is:

nitric acid 1ppm

American Industrial Hygiene Association (AIHA)

Ingredients considered according to the following cutoffs

Very Toxic (T+)	$\geq 0.1\%$	Toxic (T)	$\geq 3.0\%$
R50	$\geq 0.25\%$	Corrosive (C)	$\geq 5.0\%$
R51	$\geq 2.5\%$		
else	$\geq 10\%$		

where percentage is percentage of ingredient found in the mixture

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

## Section 7 - HANDLING AND STORAGE

### PROCEDURE FOR HANDLING

- DO NOT allow clothing wet with material to stay in contact with skin.
- Use good occupational work practice. Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Avoid contact with incompatible materials.
- WARNING: To avoid violent reaction, ALWAYS add material to water and NEVER water to material.
- Handle and open container with care.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Wash hands with soap and water after handling.
- Work clothes should be laundered separately: NOT at home.

### SUITABLE CONTAINER

- Polyethylene or polypropylene container.
- Packing as recommended by manufacturer.
- Check all containers are clearly labelled and free from leaks.

### STORAGE INCOMPATIBILITY

- Avoid storage with glass, cement, concrete and other silicon materials; reaction produces toxic silicon tetrafluoride gas; which may pressurise and/or rupture containers.
- DO NOT use unlined steel containers.
- DO NOT use aluminium, galvanised or tin-plated containers.
- Segregate from alkalis, oxidising agents and chemicals readily decomposed by acids, i.e. cyanides, sulfides, carbonates., combustible materials and metal oxides.

### STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry area protected from environmental extremes.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations
- Consider storage in banded areas - ensure storage areas are isolated from sources of

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Section 7 - HANDLING AND STORAGE

community water (including stormwater, ground water, lakes and streams).  
· Ensure that accidental discharge to air or water is the subject of a contingency disaster management plan; this may require consultation with local authorities.  
Keep containers securely sealed.  
Store in a cool, dry and well-ventilated area.  
Store away from incompatible materials.  
Floors should be covered or coated with acid resistant material.  
DO NOT stack on wooden pallets.  
· DO NOT store in pits, depressions, basements or areas where vapours may be trapped.  
Protect containers against physical damage.  
· Check regularly for spills and leaks.

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m <sup>3</sup>	STEL ppm	STEL mg/m <sup>3</sup>	Peak ppm	Peak mg/m <sup>3</sup>
Australia Exposure Standards	nitric acid (Nitric acid)	2	5.2	4	10		
Australia Exposure Standards	hydrofluoric acid (Hydrogen fluoride (as F))					3	2.6
Australia Exposure Standards	hydrofluoric acid (Fluorides (as F))		2.5				

The following materials had no OELs on our records

• water: CAS:7732- 18- 5

### ODOUR SAFETY FACTOR (OSF)

OSF=71 (hydrofluoric acid)

### MATERIAL DATA

None assigned. Refer to individual constituents.

Exposed individuals are reasonably expected to be warned, by smell, that the Exposure Standard is being exceeded.

Odour Safety Factor (OSF) is determined to fall into either Class A or B.

The Odour Safety Factor (OSF) is defined as:

OSF= Exposure Standard (TWA) ppm/ Odour Threshold Value (OTV) ppm

Classification into classes follows:

Class	OSF	Description
A	550	Over 90% of exposed individuals are aware by smell that the Exposure Standard (TLV- TWA for example) is being reached, even when distracted by working activities

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

B	26- 550	As " A" for 50- 90% of persons being distracted
C	1- 26	As " A" for less than 50% of persons being distracted
D	0.18- 1	10- 50% of persons aware of being tested perceive by smell that the Exposure Standard is being reached
E	<0.18	As " D" for less than 10% of persons aware of being tested

### INGREDIENT DATA

#### NITRIC ACID:

Odour Threshold Value: 0.27 ppm (detection)

NOTE: Detector tubes for nitric acid, measuring in excess of 5 ppm, are commercially available.

The TLV-TWA is protective against corrosion of the skin, tissue and other membranes, against irritation to the eyes and mucous membranes, and against acute pulmonary oedema or chronic obstructive lung disease. It is not clear whether the TLV-TWA and STEL values will prevent potentiation of the toxicity of inhaled nitrogen dioxide.

#### HYDROFLUORIC ACID:

Odour Threshold for hydrogen fluoride: 0.042 ppm

NOTE: Detector tubes for hydrogen fluoride, measuring in excess of 1.5 ppm, are available commercially. Long-term measurements (8 hrs) may be conducted to detect concentrations exceeding 0.25 ppm.

Hydrogen fluoride is a primary irritant which as a gas causes severe respiratory irritation and as a liquid which causes severe and painful burns to the skin and eyes. The recommendation for TLV-TWA is based on the results of controlled inhalation studies in human volunteers. The limit is thought to minimise the potential for occurrence of dental and/or osteofluorosis (systemic fluorosis) and to prevent the risk of primary irritation to the eyes, nose, throat and lower respiration system.

At concentrations exceeding 3 ppm there have been reports of skin reddening and burning of the nose and eyes.

Odour Safety Factor(OSF)

OSF=71 (HYDROGEN FLUORIDE).

Exposed individuals are reasonably expected to be warned, by smell, that the Exposure Standard is being exceeded.

Odour Safety Factor (OSF) is determined to fall into either Class A or B.

The Odour Safety Factor (OSF) is defined as:

OSF= Exposure Standard (TWA) ppm/ Odour Threshold Value (OTV) ppm

Classification into classes follows:

Class	OSF	Description
A	550	Over 90% of exposed individuals are aware by smell that the Exposure Standard (TLV- TWA for example) is being reached, even when distracted by working activities
B	26- 550	As " A" for 50- 90% of persons being distracted
C	1- 26	As " A" for less than 50% of persons being distracted

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

D	0.18- 1	10- 50% of persons aware of being tested perceive by smell that the Exposure Standard is being reached
E	<0.18	As " D" for less than 10% of persons aware of being tested

### WATER:

No exposure limits set by NOHSC or ACGIH.

### PERSONAL PROTECTION



#### EYE

- Chemical goggles.
- Full face shield may be required for supplementary but never for primary protection of eyes
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens 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].

#### HANDS/FEET

- Barrier cream. and · Neoprene rubber gloves or · Nitrile rubber gloves · Elbow length PVC gloves.
- Rubber boots. · PVC safety gumboots.

#### OTHER

- Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.
- Ensure there is ready access to a safety shower.

Always ensure that a supply, is on hand, of calcium gluconate gel for treatment of burns and calcium carbonate tablets for accidental ingestion.

#### RESPIRATOR

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level ppm (volume)	Maximum Protection Factor	Half- face Respirator	Full- Face Respirator
1000	10	BE- AUS P	-

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

1000	50	-	BE- AUS P
5000	50	Airline *	-
5000	100	-	BE- 2 P
10000	100	-	BE- 3 P
	100+		Airline**

\* - Continuous Flow

\*\* - Continuous-flow or positive pressure demand.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

For further information consult site specific CHEMWATCH data (if available), or your Occupational Health and Safety Advisor.

## ENGINEERING CONTROLS

Use in a well-ventilated area.

General exhaust is adequate under normal operating conditions. Local exhaust ventilation may be required in specific circumstances. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### APPEARANCE

Opaque white acidic gel; mixes with water. Pungent acidic odour.

### PHYSICAL PROPERTIES

Liquid.

Mixes with water.

Corrosive.

Acid.

Toxic or noxious vapours/gas.

Molecular Weight: Not applicable

Melting Range (°C): Not available

Solubility in water (g/L): Miscible

pH (1% solution): Not available.

Volatile Component (%vol): Not available

Relative Vapour Density (air=1): Not available.

Lower Explosive Limit (%): Not applicable

Autoignition Temp (°C): Not available

State: Non slump paste

Boiling Range (°C): Not available

Specific Gravity (water= 1): 1.33- 1.35

pH (as supplied): < 1

Vapour Pressure (kPa): Not available

Evaporation Rate: Not available

Flash Point (°C): Not applicable

Upper Explosive Limit (%): Not applicable

Decomposition Temp (°C): Not Available

Viscosity: Not Available

## Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

### CONDITIONS CONTRIBUTING TO INSTABILITY

Presence of heat source. · Presence of incompatible materials

· Product is considered stable.

· Hazardous polymerisation will not occur.

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## Section 11 - TOXICOLOGICAL INFORMATION

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### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

##### SWALLOWED

Considered an unlikely route of entry in commercial/industrial environments.  
The material is extremely corrosive to the gastro-intestinal tract and contact may cause rapid tissue destruction with severe burns and may be fatal if swallowed unless immediate treatment is applied.

##### EYE

Eye contact is extremely painful and may cause rapid corneal damage.  
The material is highly corrosive to the eyes and contact may cause rapid tissue destruction and is capable of causing severe damage with loss of sight.  
The vapour is highly discomforting and capable of causing pain and severe conjunctivitis. Corneal injury may develop, with possible permanent impairment of vision, if not promptly and adequately treated.  
The vapour may produce pronounced discomfort of the eyes when present at higher concentrations and this generally gives warning of excessive exposure and the need for control measures to ensure safe working conditions.

##### SKIN

The material is highly corrosive to the skin and may rapidly cause severe burns, ulceration.  
Fluorides are easily absorbed through the skin and cause death of soft tissue and erode bone. Healing is delayed and death of tissue may continue to spread beneath skin.  
The vapour is highly discomforting and may be harmful if exposure is prolonged.  
Bare unprotected skin should not be exposed to this material.  
Skin contact causes yellow discolouration of the skin.

##### INHALED

The vapour is extremely discomforting to the upper respiratory tract and lungs and is harmful if inhaled.  
Inhalation hazard is increased at higher temperatures.  
Acute effects of fluoride inhalation include irritation of nose and throat, coughing and chest discomfort. A single acute over-exposure may even cause nose bleed. Pre-existing respiratory conditions such as emphysema, bronchitis may be aggravated by exposure. Occupational asthma may result from exposure.  
Reactions may not occur on exposure but response may be delayed with symptoms only appearing many hours later.

##### CHRONIC HEALTH EFFECTS

Considered toxic by all exposure routes.  
Principal routes of exposure are usually by skin contact, eye contact with the material and inhalation of vapour.  
Hydrogen fluoride easily penetrates the skin and causes destruction and corrosion of the bone and underlying tissue. Ingestion causes severe pains and burns in the mouth and throat and blood calcium levels are dangerously reduced. Symptoms include spasm and twitching of the muscles, high fever, convulsions and general extreme pain. Inhalation may cause corrosion of the throat, nose and lungs, leading to severe inflammation and lung swelling.  
Prolonged or repeated overexposure to low concentrations of nitric acid vapour may cause chronic bronchitis, corrosion of teeth, even chemical pneumonitis.

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Section 11 - TOXICOLOGICAL INFORMATION

## TOXICITY AND IRRITATION

Not available. Refer to individual constituents.

### NITRIC ACID:

unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

#### TOXICITY

Oral (human) LDLo: 430 mg/kg  
Inhalation (rat) LC50: 2500 ppm/1h \* \*  
DuPont  
Oral (?) LD50: 50- 500 mg/kg \*  
Unreported (man) LDLo: 110 mg/kg  
[Various Manufacturers]

#### IRRITATION

Nil Reported

### HYDROFLUORIC ACID:

unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

#### TOXICITY

Inhalation (rat) 5: min LC50 4970 ppm  
Inhalation (rat) 1: Hour LC50 1310 ppm  
Inhalation (human) LCLo: 50 ppm/30m  
Inhalation (man) TCLo: 100 mg/m<sup>3</sup>/1m  
Inhalation (rat) LC50: 1276 ppm/1h

#### IRRITATION

Eye (human): 50 mg - SEVERE

Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.

The material may produce severe irritation to the eye causing pronounced inflammation.

Repeated or prolonged exposure to irritants may produce conjunctivitis.

(liver and kidney damage) [Manufacturer]

for hydrogen fluoride (as vapour)

### WATER:

unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

No significant acute toxicological data identified in literature search.

MATERIAL	CARCINOGEN	REPROTOXIN	SENSITISER	SKIN
hydrofluoric acid	IARC:3			

### CARCINOGEN

IARC: International Agency for Research on Cancer (IARC) Carcinogens: hydrofluoric acid  
Category: The substance is classified by IARC as Group 3: NOT classifiable as to its carcinogenicity to humans. Evidence of carcinogenicity may be inadequate or limited in animal testing.

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## Section 12 - ECOLOGICAL INFORMATION

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DO NOT discharge into sewer or waterways.  
Refer to data for ingredients, which follows:

### HYDROFLUORIC ACID:

Although small amounts of fluorides are conceded to have beneficial effects, two forms of chronic toxic effect, dental fluorosis and skeletal fluorosis may be caused by excessive intake over long periods. Fluorides are absorbed by humans following inhalation of workplace and ambient air that has been contaminated, ingestion of drinking water and foods and dermal contact.

Both hydrogen fluoride and particulate fluorides will be transported in the atmosphere and deposited on land or water by wet and dry deposition. Non-volatile inorganic fluoride particulates are removed from the atmosphere via condensation or nucleation processes. Fluorides adsorbed on particulate matter in the atmosphere are generally stable and are not readily hydrolysed, although they may be degraded by radiation if they persist in the atmosphere. Fluorine and the silicon fluorides (fluosilicates, silicofluorides) are hydrolysed in the atmosphere to form hydrogen fluoride. Hydrogen fluoride may combine with water vapour to produce an aerosol or fog of aqueous hydrofluoric acid. Based upon available data, inorganic fluoride compounds, with the exception of sulfur hexafluoride, are not expected to remain in the troposphere for long periods or to migrate to the stratosphere. Estimates of the residence time of sulfur hexafluoride in the atmosphere range from 500 to several thousand years. Fluoride in aerosols can be transported over large distances by wind or as a result of atmospheric turbulence. The distance travelled is determined by the deposition velocity of both the gaseous hydrogen fluoride and the fluorides in particulate form. Atmospheric fluorides may be transported to soils and surface waters through both wet and dry deposition processes.

Fluorides undergo transformations in soil and water, forming complexes and binding strongly to soil and sediment.

In water, the transport and transformation of inorganic fluorides are influenced by pH, water hardness and the presence of ion-exchange materials such as clays. In natural water, fluoride forms strong complexes with aluminum in water, and fluorine chemistry in water is largely regulated by aluminum concentration and pH. Below pH 5, fluoride is almost entirely complexed with aluminum and consequently, the concentration of free F<sup>-</sup> is low. As the pH increases, Al-OH complexes dominate over Al-F complexes and the free F<sup>-</sup> levels increase. Fluoride forms stable complexes with calcium and magnesium, which are present in sea water. Calcium carbonate precipitation dominates the removal of dissolved fluoride from sea water. The residence time for fluoride in ocean sediment is calculated to be 2–3 million years. Fluorosilicic acid and hydrofluoric acid in high aquatic concentrations such as may be found in industrial waste ponds may volatilise, releasing silicon tetrafluoride and hydrogen fluoride into the atmosphere.

Solubilisation of inorganic fluorides from minerals may also be enhanced by the presence of ion-exchange materials (e.g., bentonite clays and humic acid). Once dissolved, inorganic fluorides remain in solution under conditions of low pH and hardness and in the presence of ion-exchange material. Soluble inorganic fluorides may also form aerosols at the air–water interface or vaporise into the atmosphere whereas undissolved species generally undergo sedimentation.

Factors that influence the mobility of inorganic fluorides in soil are pH and the formation of aluminium and calcium complexes. In more acidic soils, concentrations of inorganic fluoride were considerably higher in the deeper horizons. The low affinity of fluorides for organic material results in leaching from the more acidic surface horizon and increased retention by clay minerals and silts in the more alkaline, deeper horizons. The maximum adsorption of fluoride to soil was reported to occur at pH 5.5. In acidic soils with pH below 6, most of the fluoride is in complexes with either aluminium or iron. Fluoride in alkaline soils at pH 6.5 and above is almost completely fixed in soils as calcium fluoride, if sufficient calcium carbonate is available. Fluoride is extremely immobile in soil, as determined by lysimeter experiments.

Populations living in areas with high fluoride levels in groundwater may be exposed to

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higher levels of fluorides in their drinking water or in beverages prepared with the water. Among these populations, outdoor laborers, people living in hot climates, and people with polydipsia will generally have the greatest daily intake of fluorides because they consume greater amounts of water.

Foods characteristically high in fluoride content are certain types of fish and seafood (1.9–28.5 mg/kg), especially those types in which the bones are consumed, bone products such as bone meal and gelatin, and tea, which contains approximately 0.52 mg fluoride/cup. Fluoride is mainly absorbed by the body in the form of hydrogen fluoride, which has a pKa of 3.45. That is, when ionic fluoride enters the acidic environment of the stomach lumen, it is largely converted into hydrogen fluoride. Most of the fluoride that is not absorbed from the stomach will be rapidly absorbed from the small intestine. Fluorides have been shown to accumulate in animals that consume fluoride-containing foliage. However, accumulation is primarily in skeletal tissue and therefore, it is unlikely that fluoride will biomagnify up the food chain.

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

## Section 13 - DISPOSAL CONSIDERATIONS

- Recycle wherever possible or consult manufacturer for recycling options.
- Consult State Land Waste Management Authority for disposal.
- Treat and neutralise at an effluent treatment plant.
- Use soda ash or slaked lime to neutralise.
- Recycle containers, otherwise dispose of in an authorised landfill.

## Section 14 - TRANSPORTATION INFORMATION



Labels Required: CORROSIVE, TOXIC  
HAZCHEM: 2XE

### UNDG:

Dangerous Goods Class:	8	Subrisk:	6.1
UN Number:	2922	Packing Group:	II
Shipping Name: CORROSIVE LIQUID, TOXIC, N.O.S. contains hydrofluoric acid and nitric acid			

### Air Transport IATA:

ICAO/IATA Class:	8	ICAO/IATA Subrisk:	6.1
UN/ID Number:	2922	Packing Group:	II
Special provisions:	A3		
Shipping Name: CORROSIVE LIQUID, TOXIC, N.O.S. *			

### Maritime Transport IMDG:

IMDG Class:	8	IMDG Subrisk:	6.1
UN Number:	2922	Packing Group:	II

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EMS Number: F- A, S- B Special provisions: 274 944  
Limited Quantities: 1 L Marine Pollutant: Not Determined  
Shipping Name: CORROSIVE LIQUID, TOXIC, N.O.S.

## Section 15 - REGULATORY INFORMATION

### POISONS SCHEDULE: S7

### REGULATIONS

1102/78 BOSS Pickling Gel (CAS: None):  
No regulations applicable

nitric acid (CAS: 7697-37-2) is found on the following regulatory lists;

- Australia - Victoria Occupational Health and Safety Regulations - Schedule 9: Materials at Major Hazard Facilities (And Their Threshold Quantity) Table 2
- Australia Exposure Standards
- Australia Hazardous Substances
- Australia High Volume Industrial Chemical List (HVICL)
- Australia Inventory of Chemical Substances (AICS)
- Australia National Pollutant Inventory
- Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Appendix E (Part 2)
- Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Appendix F (Part 3)
- Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 5
- Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 6
- IMO IBC Code Chapter 17: Summary of minimum requirements
- IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk
- International Council of Chemical Associations (ICCA) - High Production Volume List
- OECD Representative List of High Production Volume (HPV) Chemicals

hydrofluoric acid (CAS: 7664-39-3) is found on the following regulatory lists;

- Australia - Australian Capital Territory - Environment Protection Regulation: Pollutants entering waterways taken to cause environmental harm (IRRIG)
- Australia - Australian Capital Territory Environment Protection Regulation Pollutants entering waterways - Agricultural uses (Stock)
- Australia - Australian Capital Territory Environment Protection Regulation Pollutants entering waterways - Domestic water quality
- Australia - Queensland Hazardous Materials and Prescribed Quantities for Major Hazard Facilities
- Australia Dangerous Goods Code Draft 7th Edition - List of Common Pesticides with Corresponding UN Numbers
- Australia Exposure Standards
- Australia Hazardous Substances
- Australia Inventory of Chemical Substances (AICS)
- Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Appendix E (Part 2)
- Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Appendix F (Part 3)
- Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Appendix J (Part 2)
- Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 2
- Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 3
- Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 4
- Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 5
- Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 6
- Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 7
- International Agency for Research on Cancer (IARC) Carcinogens
- OECD Representative List of High Production Volume (HPV) Chemicals
- The Australia Group Export Control List: Chemical Weapons Precursors
- WHO Guidelines for Drinking-water Quality - Guideline values for chemicals that are of health significance in drinking-water

water (CAS: 7732-18-5) is found on the following regulatory lists;

- Australia Inventory of Chemical Substances (AICS)
- IMO IBC Code Chapter 18: List of products to which the Code does not apply
- OECD Representative List of High Production Volume (HPV) Chemicals

## Section 16 - OTHER INFORMATION

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

A list of reference resources used to assist the committee may be found at:  
[www.chemwatch.net/references](http://www.chemwatch.net/references).

The (M)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.

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