Safety Data Sheet

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product identifier

Product Name • **3-1 Etch**

Synonyms • Acid etch; Etchant 3-1; Three-to-one etch

Product Code • 80123

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

Relevant identified use(s) • Etching

1.3 Details of the supplier of the safety data sheet

Manufacturer • Air Liquide

2700 Post Oak Blvd.
Houston, TX 77056
United States
www.us.airliquide.com
sds@airliquide.com

Telephone (Technical) • 713-896-2896

Telephone (Technical) • 800-819-1704

1.4 Emergency telephone number

Manufacturer • 800-424-9300 - CHEMTREC

Manufacturer • +1 703-527-3887 - Outside United States

Section 2: Hazards Identification

EU/EEC

According to Regulation (EC) No 1272/2008 (CLP)/REACH 1907/2006 [amended by 453/2010]
According to EU Directive 67/548/EEC (DSD) or 1999/45/EC (DPD)

2.1 Classification of the substance or mixture

CLP •
Acute Toxicity Oral 2 - H300
Acute Toxicity Dermal 1 - H310
Skin Corrosion 1A - H314
Serious Eye Damage 1 - H318
Acute Toxicity Inhalation 4 - H332

DSD/DPD •
Very Toxic (T+)
Corrosive (C)
R26/27/28, R35

2.2 Label Elements

CLP

DANGER

Hazard statements
- H300 - Fatal if swallowed
- H310 - Fatal in contact with skin
- H314 - Causes severe skin burns and eye damage.
- H318 - Causes serious eye damage
- H332 - Harmful if inhaled

Precautionary statements

Prevention
- P260 - Do not breathe mist/vapours/spray.
- P262 - Do not get in eyes, on skin, or on clothing.
- P264 - Wash thoroughly after handling.
- P270 - Do not eat, drink or smoke when using this product.
- P271 - Use only outdoors or in a well-ventilated area.
- P280 - Wear protective gloves/protective clothing/eye protection/face protection.

Response
- P304+P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- P312 - Call a POISON CENTER or doctor/physician if you feel unwell.
- P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P310 - Immediately call a POISON CENTER or doctor/physician.
- P322 - Specific measures, see supplemental first aid information.
- P361 - Remove/Take off immediately all contaminated clothing.
- P363 - Wash contaminated clothing before reuse.
- P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P301+P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
- P330 - Rinse mouth.
- P331 - Do NOT induce vomiting.

Storage/Disposal
- P405 - Store locked up.
- P501 - Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

DSD/DPD

Risk phrases
- R26/27/28 - Very toxic by inhalation, in contact with skin and if swallowed.
- R35 - Causes severe burns.

Safety phrases
- S27 - Take off immediately all contaminated clothing.
- S28 - After contact with skin, wash immediately with plenty of …
- S36 - Wear suitable protective clothing.
- S37 - Wear suitable gloves.
- S39 - Wear eye/face protection.
- S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

2.3 Other Hazards

CLP
- According to Regulation (EC) No. 1272/2008 (CLP) this material is considered hazardous.

DSD/DPD
- According to European Directive 1999/45/EC this material is considered dangerous.

United States (US)

According to OSHA 29 CFR 1910.1200 HCS

2.1 Classification of the substance or mixture

OSHA HCS 2012
- Serious Eye Damage 1 - H318

Acute Toxicity Oral 1 - H300
Acute Toxicity Dermal 2 - H310
Skin Corrosion 1A - H314
Acute Toxicity Inhalation 4 - H332

2.2 Label elements

OSHA HCS 2012

DANGER

Hazard statements

- Fatal if swallowed - H300
  Fatal in contact with skin - H310
  Causes severe skin burns and eye damage. - H314
  Causes serious eye damage - H318
  Harmful if inhaled - H332

Precautionary statements

Prevention

- Do not breathe gas. - P260
  Do not get in eyes, on skin, or on clothing. - P262
  Wash thoroughly after handling. - P264
  Do not eat, drink or smoke when using this product. - P270
  Use only outdoors or in a well-ventilated area. - P271
  Wear protective gloves/protective clothing/eye protection/face protection. - P280

Response

- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. - P304+P340
  Call a POISON CENTER or doctor/physician if you feel unwell. - P312
  IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. - P303+P361+P353
  Specific treatment, see supplemental first aid information. - P321
  Wash contaminated clothing before reuse. - P363
  IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. - P305+P351+P338
  Immediately call a POISON CENTER or doctor/physician. - P310
  IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. - P301+P330+P331
  IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. - P301+P310

Storage/Disposal

- Store locked up. - P405
  Dispose of content and/or container in accordance with local, regional, national, and/or international regulations. - P501

2.3 Other hazards

OSHA HCS 2012

- Under United States Regulations (29 CFR 1910.1200 - Hazard Communication Standard), this product is considered hazardous.

Canada

According to WHMIS

2.1 Classification of the substance or mixture

WHMIS

- Very Toxic - D1A
  Other Toxic Effects - D2A
  Corrosive - E

2.2 Label elements

WHMIS

- Very Toxic - D1A
  Other Toxic Effects - D2A

Corrosive - E

2.3 Other hazards

WHMIS

- In Canada, the product mentioned above is considered hazardous under the Workplace Hazardous Materials Information System (WHMIS).

2.4 Other information

NFPA

Section 3 - Composition/Information on Ingredients

3.1 Substances

- Material does not meet the criteria of a substance in accordance with Regulation (EC) No 1272/2008.

3.2 Mixtures

Composition				
Chemical Name	**Identifiers**	**%**	**LD50/LC50**	**Classifications According to Regulation/Directive**
Nitric acid	**CAS:**7697-37-2 **EC Number:**231-714-2 **EU Index:**007-004-00-1	< 58%	Inhalation-Rat LC50 • 67 ppm 4 Hour(s)	**EU DSD/DPD:** Annex VI, Table 3.2 - C; R35 O; R8 **EU CLP:** Annex VI, Table 3.1 - Ox. Liq. 3, H272; Skin Corr. 1A, H314 **OSHA HCS 2012:** Ox. Liq. 3; Skin Corr. 1A; Eye Dam. 1
Hydrofluoric acid	**CAS:**7664-39-3 **EC Number:**231-634-8 **EU Index:**009-002-00-6	< 12%	Inhalation-Rat LC50 • 1276 ppm 1 Hour(s)	**EU DSD/DPD:** Annex VI, Table 3.2 - T+; R26/27/28 C; R35 **EU CLP:** Annex VI, Table 3.1 - Acute Tox. 2, H330; Acute Tox. 1, H310; Acute Tox. 2, H300; Skin Corr. 1A, H314 **OSHA HCS 2012:** Acute Tox. 2 (inhl); Eye Dam. 1; Skin Corr. 1A

See Section 16 for full text of H-statements and R-phrases.

Section 4 - First Aid Measures

4.1 Description of first aid measures

Inhalation

- Move victim to fresh air. Administer oxygen if breathing is difficult. Give artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Get medical attention immediately.

Skin

- For minor skin contact, avoid spreading material on unaffected skin. In case of contact with substance, immediately flush skin with running water for at least 20 minutes. Remove and isolate contaminated clothing. Get medical attention immediately.

Eye

- Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove

contact lenses, if present, after the first five minutes, then continue rinsing eye. Get medical attention immediately.

Ingestion

- If swallowed, rinse mouth with water (only if the person is conscious) Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Give plenty of water to drink. Do not use mouth-to-mouth method if victim ingested the substance. Obtain medical attention immediately if ingested.

4.2 Most important symptoms and effects, both acute and delayed

- Refer to Section 11 - Toxicological Information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to Physician

- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

Section 5 - Firefighting Measures

5.1 Extinguishing media

Suitable Extinguishing Media

- LARGE FIRES: Dry chemical, CO2, alcohol-resistant foam or water spray.
  SMALL FIRES: Dry chemical, CO2 or water spray.

Unsuitable Extinguishing Media

- No data available

5.2 Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards

- Containers may explode when heated.
  Acid reacts with most metals to release hydrogen gas, which can form explosive mixtures with air.

Hazardous Combustion Products

- When involved in a fire, this material may decompose and produce irritating vapors, and toxic gases (e.g., fluorine and other fluoride compounds).

5.3 Advice for firefighters

- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.
  Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
  Wear positive pressure self-contained breathing apparatus (SCBA).
  SMALL FIRES: Move containers from fire area if you can do it without risk.
  Runoff from fire control may cause pollution.

Section 6 - Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal Precautions

- Ventilate enclosed areas. Do not walk through spilled material. Wear appropriate personal protective equipment, avoid direct contact. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

Emergency Procedures

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions. Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Do not get water inside container.

6.2 Environmental precautions

- Prevent entry into waterways, sewers, basements or confined areas.

6.3 Methods and material for containment and cleaning up

Containment/Clean-up Measures

- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
  Dike to collect large liquid spills.
  A vapor suppressing foam may be used to reduce vapors.

Use water spray to reduce vapors or divert vapor cloud drift.
Neutralize residue with neutralizing agent appropriate for acidic materials. Test area with litmus paper to ensure neutralization is complete.

6.4 Reference to other sections

- Refer to Section 8 - Exposure Controls/Personal Protection and Section 13 - Disposal Considerations.

Section 7 - Handling and Storage

7.1 Precautions for safe handling

Handling

- Handle and open container with care. Use only with adequate ventilation. Use caution when combining with water; DO NOT add water to corrosive liquid, ALWAYS add corrosive liquid to water while stirring to prevent release of heat, steam and fumes. Wear appropriate personal protective equipment, avoid direct contact. Do not breathe mist, vapours, spray. Do not get in eyes, on skin, or on clothing. Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco.

7.2 Conditions for safe storage, including any incompatibilities

Storage

- Keep container tightly closed. Store in a cool, dry, well-ventilated place. Keep away from incompatible materials. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged.

7.3 Specific end use(s)

- Refer to Section 1.2 - Relevant identified uses.

Section 8 - Exposure Controls/Personal Protection

8.1 Control parameters

Exposure Limits/Guidelines						
	Result	**ACGIH**	**Canada Ontario**	**Canada Quebec**	**China**	**China Highly Toxic Goods**
Hydrofluoric acid (7664-39-3)	Ceilings	2 ppm Ceiling (as F)	2 ppm Ceiling (as F)	3 ppm Ceiling (as F); 2.6 mg/m3 Ceiling (as F)	2 mg/m3 Ceiling [MAC] (as F)	2 mg/m3 Ceiling
	TWAs	0.5 ppm TWA (as F)	0.5 ppm TWA (as F)	Not established	Not established	Not established
Nitric acid (7697-37-2)	STELs	4 ppm STEL	4 ppm STEL	4 ppm STEV; 10 mg/m3 STEV	Not established	Not established
	TWAs	2 ppm TWA	2 ppm TWA	2 ppm TWAEV; 5.2 mg/m3 TWAEV	Not established	Not established

Exposure Limits/Guidelines (Con't.)						
	Result	**Europe**	**France**	**Germany DFG**	**Germany TRGS**	**Ireland**
	STELs	Not established	3 ppm STEL [VLCT] (restrictive limit); 2.5 mg/m3 STEL [VLCT] (restrictive limit)	Not established	Not established	3 ppm STEL (as F); 2.5 mg/m3 STEL (as F)
Hydrofluoric acid (7664-39-3)	TWAs	Not established	1.8 ppm TWA [VME] (restrictive limit); 1.5 mg/m3 TWA [VME] (restrictive limit)	Not established	1 ppm TWA AGW (The risk of damage to the embryo or fetus can be excluded when AGW and BGW values are observed, exposure factor 2); 0.83 mg/m3 TWA AGW (The risk of damage to the	1.8 ppm TWA (as F); 1.5 mg/m3 TWA (as F)

					embryo or fetus can be excluded when AGW and BGW values are observed, exposure factor 2)	
	Ceilings	Not established	Not established	2 ppm Peak; 1.66 mg/m3 Peak	Not established	Not established
	MAKs	Not established	Not established	1 ppm TWA MAK; 0.83 mg/m3 TWA MAK	Not established	Not established
Nitric acid (7697-37-2)	STELs	1 ppm STEL; 2.6 mg/m3 STEL	1 ppm STEL [VLCT] (indicative limit); 2.6 mg/m3 STEL [VLCT] (indicative limit)	Not established	Not established	1 ppm STEL; 2.6 mg/m3 STEL
	TWAs	Not established	Not established	Not established	1 ppm TWA AGW (exposure factor 1); 2.6 mg/m3 TWA AGW	Not established

Exposure Limits/Guidelines (Con't.)

	Result	Israel	Italy	NIOSH	OSHA	OSHA Vacated
Hydrofluoric acid (7664-39-3)	STELs	Not established	3 ppm STEL; 2.5 mg/m3 STEL	Not established	Not established	6 ppm STEL (as F)
	TWAs	0.5 ppm TWA (as F)	1.8 ppm TWA; 1.5 mg/m3 TWA	3 ppm TWA; 2.5 mg/m3 TWA	3 ppm TWA (as F)	3 ppm TWA (as F)
	Ceilings	2 ppm Ceiling (as F)	Not established	6 ppm Ceiling (15 min); 5 mg/m3 Ceiling (15 min)	Not established	Not established
Nitric acid (7697-37-2)	STELs	4 ppm STEL	1 ppm STEL; 2.6 mg/m3 STEL	4 ppm STEL; 10 mg/m3 STEL	Not established	4 ppm STEL; 10 mg/m3 STEL
	TWAs	2 ppm TWA	Not established	2 ppm TWA; 5 mg/m3 TWA	2 ppm TWA; 5 mg/m3 TWA	2 ppm TWA; 5 mg/m3 TWA

Exposure Limits/Guidelines (Con't.)

	Result	Portugal	Spain	Sweden
Hydrofluoric acid (7664-39-3)	Ceilings	2 ppm Ceiling [VLE-CM] (as F)	Not established	2 ppm CLV; 1.7 mg/m3 CLV
	TWAs	0.5 ppm TWA [VLE-MP] (as F)	1.8 ppm TWA [VLA-ED] (indicative limit value); 1.5 mg/m3 TWA [VLA-ED] (indicative limit value)	Not established
	STELs	Not established	3 ppm STEL [VLA-EC]; 2.5 mg/m3 STEL [VLA-EC]	Not established
	Biological Limit Values (BLV)	Not established	8 mg/L urine end of shift Fluorides (2,F,I)	Not established
Nitric acid (7697-37-2)	STELs	4 ppm STEL [VLE-CD	1 ppm STEL [VLA-EC]; 2.6 mg/m3 STEL [VLA-EC]	5 ppm STV; 13 mg/m3 STV
	TWAs	2 ppm TWA [VLE-MP]	Not established	2 ppm LLV; 5 mg/m3 LLV

Exposure Control Notations

Ireland

•Hydrofluoric acid (7664-39-3): **Skin:** (Potential for cutaneous absorption)

Germany TRGS

•Hydrofluoric acid (7664-39-3): **Skin:** (skin notation)

Germany DFG

•Hydrofluoric acid (7664-39-3): **Pregnancy:** (no risk to embryo/fetus if exposure limits adhered to)

8.2 Exposure controls

Engineering Measures/Controls

- Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal Protective Equipment

Respiratory

- Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or symptoms are experienced.

Eye/Face

- Wear chemical splash safety goggles.

Skin/Body

- Wear appropriate gloves.

Environmental Exposure Controls

- Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways. Follow best practice for site management and disposal of waste.

Key to abbreviations

ACGIH = American Conference of Governmental Industrial Hygiene

MAK = Maximale Arbeitsplatz Konzentration is the maximum permissible concentration

NIOSH = National Institute of Occupational Safety and Health

OSHA = Occupational Safety and Health Administration

STEL = Short Term Exposure Limits are based on 15-minute exposures

TWA = Time-Weighted Averages are based on 8h/day, 40h/week exposures

STEV = Short Term Exposure Value

TWAEV = Time-Weighted Average Exposure Value

Section 9 - Physical and Chemical Properties

9.1 Information on Physical and Chemical Properties

Material Description			
Physical Form	Liquid	Appearance/Description	Yellow-white liquid with an acetic odor.
Color	Yellow-white	Odor	Acetic
Odor Threshold	Data lacking		
General Properties			
Boiling Point	> 100 C(> 212 F)	Melting Point	< 17 C(< 62.6 F)
Decomposition Temperature	Data lacking	pH	< 1
Specific Gravity/Relative Density	1.35 Water=1	Water Solubility	100 %
Viscosity	Data lacking	Explosive Properties	Data lacking
Oxidizing Properties:	Data lacking		
Volatility			
Vapor Pressure	Data lacking	Vapor Density	Data lacking
Evaporation Rate	Data lacking		
Flammability			
Flash Point	Data lacking	UEL	Data lacking
LEL	Data lacking	Autoignition	Data lacking
Flammability (solid, gas)	Data lacking		

Environmental			
Octanol/Water Partition coefficient	Data lacking		

9.2 Other Information

- No additional physical and chemical parameters noted.

Section 10: Stability and Reactivity

10.1 Reactivity

- No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

- Stable

10.3 Possibility of hazardous reactions

- Hazardous polymerization will not occur.

10.4 Conditions to avoid

- Excess heat.

10.5 Incompatible materials

- Contact of this product with most common metals (except aluminum) will produce flammable hydrogen gas. This product is not compatible with bases and can react violently. Hydrofluoric Acid can dissolve glass, ceramics, metals containing silica, natural rubber and leather. Hydrofluoric Acid also reacts with many other materials such as cyanogen fluoride, sodium (with aqueous acid), methanesulfonic acid, acetic anhydride, chlorosulfonic acid, ethylene diamine, ethylene imine, oleum, propylene oxide, vinyl acetate, sodium tetrafluoro silicate, and N-phenyl azo piperdine. Due to the presence of the Hydrofluoric Acid in this product, this solution must be considered incompatible with glass and other silica based compounds.

10.6 Hazardous decomposition products

- Products of thermal decomposition include fluorine and other fluoride compounds.

Section 11 - Toxicological Information

11.1 Information on toxicological effects

Components		
Hydrofluoric acid (< 12%)	7664-39-3	**Acute Toxicity:** Inhalation-Rat LC50 • 1276 ppm 1 Hour(s); *Sense Organs and Special Senses:Eye*:**Lacrimation**; *Behavioral*:**Changes in motor activity (specific assay)**; *Gastrointestinal*:**Changes in structure or function of salivary glands**; **Irritation:** Eye-Human • 50 mg • Severe irritation; Skin-Rat • 50 % 3 Minute(s) • Severe irritation; **Reproductive:** Inhalation-Rat TCLo • 470 µg/m³ 4 Hour(s)(1-22D preg); *Reproductive Effects:Effects on Fertility*:**Pre-implantation mortality**; *Reproductive Effects:Effects on Fertility*:**Post-implantation mortality**
Nitric acid (< 58%)	7697-37-2	**Acute Toxicity:** Inhalation-Rat LC50 • 130 mg/m³ 4 Hour(s); **Reproductive:** Ingestion/Oral-Rat TDLo • 2345 mg/kg (18D preg); *Reproductive Effects:Effects on Newborn*:**Biochemical and metabolic**

GHS Properties	Classification
Acute toxicity	**EU/CLP** • Acute Toxicity - Dermal 1 - ATEmix(dermal)=42 mg/kg; Acute Toxicity - Inhalation 4 - ATEmix(inhl, mist)=2.31 mg/L; Acute Toxicity - Oral 2 - ATEmix(oral)=42 mg/kg **OSHA HCS 2012** • Acute Toxicity - Dermal 2; Acute Toxicity - Inhalation 4 - ATEmix

	(inhl, mist)=2.31 mg/L; Acute Toxicity - Oral 1
Aspiration Hazard	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
Carcinogenicity	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
Germ Cell Mutagenicity	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
Skin corrosion/Irritation	**EU/CLP** • Skin Corrosion 1A **OSHA HCS 2012** • Skin Corrosion 1A
Skin sensitization	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
STOT-RE	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
STOT-SE	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
Toxicity for Reproduction	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
Respiratory sensitization	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
Serious eye damage/Irritation	**EU/CLP** • Serious Eye Damage 1 **OSHA HCS 2012** • Serious Eye Damage 1

Potential Health Effects

Inhalation

Acute (Immediate)
- Harmful if inhaled. May cause corrosive burns - irreversible damage.

Chronic (Delayed)
- Repeated or prolonged exposure to corrosive fumes may cause bronchial irritation with chronic cough.

Skin

Acute (Immediate)
- Fatal in contact with skin. Causes severe skin burns and eye damage.

Chronic (Delayed)
- Repeated or prolonged exposure to corrosive materials will cause dermatitis.

Eye

Acute (Immediate)
- Causes serious eye damage.

Chronic (Delayed)
- Repeated or prolonged exposure to corrosive materials or fumes may cause conjunctivitis.

Ingestion

Acute (Immediate)
- Fatal if swallowed. May cause irreversible damage to mucous membranes.

Chronic (Delayed)
- Repeated or prolonged exposure to corrosive materials or fumes may cause gastrointestinal distrubances.

Key to abbreviations

LC = Lethal Concentration
TC = Toxic Concentration
TD = Toxic Dose

Section 12 - Ecological Information

12.1 Toxicity

- Material data lacking.

12.2 Persistence and degradability

- Material data lacking.

12.3 Bioaccumulative potential

- Material data lacking.

12.4 Mobility in Soil

- Material data lacking.

12.5 Results of PBT and vPvB assessment

- No PBT and vPvB assessment has been conducted.

12.6 Other adverse effects

- No studies have been found.

Section 13 - Disposal Considerations

13.1 Waste treatment methods

Product waste
- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Packaging waste
- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Section 14 - Transport Information

	14.1 UN number	14.2 UN proper shipping name	14.3 Transport hazard class(es)	14.4 Packing group	14.5 Environmental hazards
DOT	UN2922	Corrosive liquid,toxic,n.o.s (Nitric acid, Hydrofluoric acid)	6.1,8	II	NDA
TDG	UN2922	CORROSIVE LIQUID, TOXIC, N.O.S. (Nitric acid, Hydrofluoric acid)	6.1,8	II	Potential Marine Pollutant
IMO/IMDG	UN2922	CORROSIVE LIQUID, TOXIC, N.O.S. (Nitric acid, Hydrofluoric acid)	6.1,8	II	NDA
IATA/ICAO	UN2922	Corrosive liquid,toxic,n.o.s (Nitric acid, Hydrofluoric acid)	6.1,8	II	NDA

14.6 Special precautions for user
- None known.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
- Not relevant.

Section 15 - Regulatory Information

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

SARA Hazard Classifications
- Acute

State Right To Know				
Component	**CAS**	**MA**	**NJ**	**PA**
Hydrofluoric acid	7664-39-3	Yes	Yes	Yes
Nitric acid	7697-37-2	Yes	Yes	Yes

Inventory						
Component	**CAS**	**Canada DSL**	**Canada NDSL**	**China**	**EU EINECS**	**EU ELNICS**
Hydrofluoric acid	7664-39-3	Yes	No	Yes	Yes	No
Nitric acid	7697-37-2	Yes	No	Yes	Yes	No

Inventory (Con't.)		
Component	**CAS**	**TSCA**
Hydrofluoric acid	7664-39-3	Yes
Nitric acid	7697-37-2	Yes

Canada

Labor

Canada - WHMIS - Classifications of Substances

• Hydrofluoric acid	7664-39-3	D1A, D2A, E; D1B, D2A, E (40%, 50%, 70%, listed under Hydrofluoric acid)
• Nitric acid	7697-37-2	C, E (including 61.3%, 67.18%, 70%); E (0.63%, 6.3%)

Canada - WHMIS - Ingredient Disclosure List

• Hydrofluoric acid	7664-39-3	1 %
• Nitric acid	7697-37-2	1 %

Environment

Canada - CEPA - Priority Substances List

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	Not Listed

China

Environment

China - Ozone Depleting Substances - First Schedule

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	Not Listed

China - Ozone Depleting Substances - Second Schedule

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	Not Listed

China - Ozone Depleting Substances - Third Schedule

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	Not Listed

Other

China - Annex I & II - Controlled Chemicals Lists

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	Not Listed

China - Dangerous Goods List

• Hydrofluoric acid	7664-39-3	(anhydrous or solution, with >60% Hydrofluoric acid; solution, with not >60% Hydrofluoric acid)
• Nitric acid	7697-37-2	(other than red fuming, with >70% Nitric acid; other than red fuming, with not >70% Nitric acid)

China - Export Control List - Part I Chemicals

• Hydrofluoric acid	7664-39-3	
• Nitric acid	7697-37-2	Not Listed

Europe

Other

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Classification

• Hydrofluoric acid	7664-39-3	T+; R26/27/28 C; R35
• Nitric acid	7697-37-2	C; R35 O; R8

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Concentration Limits

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	70%<=C: O; R:8 20%<=C: C; R:35 5%<=C<20%: C; R:34

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Labelling

• Hydrofluoric acid	7664-39-3	T+ C R:26/27/28-35 S:(1/2)-7/9-26-36/37/39-45
• Nitric acid	7697-37-2	O C R:8-35 S:(1/2)-23-26-36-45

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Notes - Substances and Preparations

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	B

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Safety Phrases

• Hydrofluoric acid	7664-39-3	S:(1/2)-7/9-26-36/37/39-45
• Nitric acid	7697-37-2	S:(1/2)-23-26-36-45

Germany

Environment

Germany - TA Luft - Types and Classes

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	Not Listed

Germany - Water Classification (VwVwS) - Annex 1

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	Not Listed

Germany - Water Classification (VwVwS) - Annex 2 - Water Hazard Classes

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	ID Number 414, hazard class 1 - low hazard to waters (except fuming)

Germany - Water Classification (VwVwS) - Annex 3

• Hydrofluoric acid	7664-39-3	ID Number 254, hazard class 2 - hazard to waters
• Nitric acid	7697-37-2	Not Listed

Other

Germany - Specifically Regulated Chemicals in TRGS

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	Not Listed

Portugal

Other

Portugal - Prohibited Substances

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	Not Listed

United Kingdom

Environment

United Kingdom - Pollution Inventory - Schedule 1 - Thresholds for Releases to Air

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	Not Listed

Other

United Kingdom - Workplace Exposure Limits (WELs) - Substances in Review

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	Not Listed

United Kingdom - List of Dangerous Substances in Water

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	Not Listed

United States

Labor

U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals

• Hydrofluoric acid	7664-39-3	1000 lb TQ; 1000 lb TQ (anhydrous)
• Nitric acid	7697-37-2	500 lb TQ (>=94.5% by weight)

U.S. - OSHA - Specifically Regulated Chemicals

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	Not Listed

Environment

U.S. - CAA (Clean Air Act) - 1990 Hazardous Air Pollutants

• Hydrofluoric acid	7664-39-3	
• Nitric acid	7697-37-2	Not Listed

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

• Hydrofluoric acid	7664-39-3	100 lb final RQ; 45.4 kg final RQ

• Nitric acid	7697-37-2	1000 lb final RQ; 454 kg final RQ

U.S. - CERCLA/SARA - Radionuclides and Their Reportable Quantities

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs

• Hydrofluoric acid	7664-39-3	100 lb EPCRA RQ
• Nitric acid	7697-37-2	1000 lb EPCRA RQ

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs

• Hydrofluoric acid	7664-39-3	100 lb TPQ
• Nitric acid	7697-37-2	1000 lb TPQ

U.S. - CERCLA/SARA - Section 313 - Emission Reporting

• Hydrofluoric acid	7664-39-3	1.0 % de minimis concentration
• Nitric acid	7697-37-2	1.0 % de minimis concentration

U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	Not Listed

U.S. - RCRA (Resource Conservation & Recovery Act) - Hazardous Constituents - Appendix VIII to 40 CFR 261

• Hydrofluoric acid	7664-39-3	waste number U134
• Nitric acid	7697-37-2	Not Listed

U.S. - RCRA (Resource Conservation & Recovery Act) - U Series Wastes - Acutely Toxic Wastes & Other Hazardous Characteristics

• Hydrofluoric acid	7664-39-3	waste number U134 (Corrosive waste, Toxic waste)
• Nitric acid	7697-37-2	Not Listed

United States - California

Environment

U.S. - California - Proposition 65 - Carcinogens List

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	Not Listed

U.S. - California - Proposition 65 - Developmental Toxicity

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	Not Listed

U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	Not Listed

U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Female

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Male

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	Not Listed

United States - Pennsylvania

Labor

U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List

• Hydrofluoric acid	7664-39-3
• Nitric acid	7697-37-2

U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances

• Hydrofluoric acid	7664-39-3	Not Listed
• Nitric acid	7697-37-2	Not Listed

15.2 Chemical Safety Assessment

- No Chemical Safety Assessment has been carried out.

Section 16 - Other Information

Relevant Phrases (code & full text)

- H272 - May intensify fire; oxidizer
  H330 - Fatal if inhaled
  R8 - Contact with combustible material may cause fire.

Last Revision Date

- 07/October/2014

Preparation Date

- 07/October/2014

Disclaimer/Statement of Liability

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Key to abbreviations

NDA = No data available