Printing date 10/10/2024 Reviewed on 10/10/2024

1 Identification

· Product identifier

· Trade name: Stainless Steel **Etchant Solution**

· Article number: SPE389

· Details of the supplier of the safety data sheet

· Manufacturer/Supplier: Aqua Solutions, Inc. 6913 Highway 225 DEER PARK, TX 77536 USA800-256-2586

· Information department: Technical Coordinator

Sherman Nelson shermann@aquasolutions.org

· Emergency telephone number: Chemtrec: 800-424-9300 Canutec: 613-996-6666



2 Hazard(s) identification

· Classification of the substance or mixture



GHS02 Flame

Flammable Liquids 3

GHS08 Health hazard

Carcinogenicity 1A H350 May cause cancer.

Specific Target Organ Toxicity - Repeated Exposure 2 H373 May cause damage to organs through prolonged or repeated exposure.

H226 Flammable liquid and vapor.



GHS05 Corrosion

H314 Causes severe skin burns and eye damage. Skin Corrosion 1A

H318 Causes serious eye damage. Eye Damage 1



GHS07

Sensitization - Skin 1 H317 May cause an allergic skin reaction.

Specific Target Organ Toxicity - Single Exposure 3 H335 May cause respiratory irritation.

- · Label elements
- · GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS).

(Contd. on page 2)

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Trade name: Stainless Steel Etchant Solution

(Contd. of page 1)

· Hazard pictograms









GHS02

GHS05

GHS07

· Signal word Danger

· Hazard-determining components of labeling:

Hydrochloric Acid Acetic Acid, Glacial Sulfuric Acid 96 - 98%

Nitric Acid

Ferric Chloride Hexahydrate

· Hazard statements

Flammable liquid and vapor.

Causes severe skin burns and eye damage.

May cause an allergic skin reaction.

May cause cancer.

May cause respiratory irritation.

May cause damage to organs through prolonged or repeated exposure.

· Precautionary statements

Obtain special instructions before use.

Do not handle until all safety precautions have been read and understood.

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

Ground/bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting/equipment.

Use only non-sparking tools.

Take precautionary measures against static discharge.

Do not breathe dusts or mists.

Wash thoroughly after handling.

Use only outdoors or in a well-ventilated area.

Contaminated work clothing must not be allowed out of the workplace.

Wear protective gloves/protective clothing/eye protection/face protection.

If swallowed: Rinse mouth. Do NOT induce vomiting.

If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Immediately call a poison center/doctor.

IF exposed or concerned: Get medical advice/attention.

Specific treatment (see on this label).

Get medical advice/attention if you feel unwell.

If skin irritation or rash occurs: Get medical advice/attention.

Wash contaminated clothing before reuse.

In case of fire: Use CO2, powder or water spray to extinguish.

Store in a well-ventilated place. Keep container tightly closed.

Store in a well-ventilated place. Keep cool.

Store locked up.

Dispose of contents/container in accordance with local/regional/national/international regulations.

(Contd. on page 3)

Printing date 10/10/2024 Reviewed on 10/10/2024

Trade name: Stainless Steel Etchant Solution

(Contd. of page 2)

- · Classification system:
- · NFPA ratings (scale 0 4)



Health = 3 Fire = 2Reactivity = 0

· HMIS-ratings (scale 0 - 4)



- · Other hazards
- · Results of PBT and vPvB assessment
- · **PBT**: Not applicable. · **vPvB**: Not applicable.

3 Composition/information on ingredients

- · Chemical characterization: Mixtures
- · Description: Mixture of the substances listed below with nonhazardous additions.

· Dangerous components:				
CAS: 7647-01-0	Hydrochloric Acid	38.482%		
CAS: 10025-77-1	Ferric Chloride Hexahydrate	14.97%		
CAS: 64-19-7	Acetic Acid, Glacial	14.308%		
CAS: 7697-37-2	Nitric Acid	13.615%		
CAS: 7664-93-9	Sulfuric Acid 96 - 98%	5.0%		
· Table of Nonhazardous Ingredients				

CAS: 7732-18-5 Water

4 First-aid measures

- · Description of first aid measures
- · General information:

Immediately remove any clothing soiled by the product.

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

· After inhalation:

Supply fresh air and to be sure call for a doctor.

In case of unconsciousness place patient stably in side position for transportation.

- · After skin contact: Immediately wash with water and soap and rinse thoroughly.
- · After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.
- · After swallowing: Drink copious amounts of water and provide fresh air. Immediately call a doctor.
- · Information for doctor:
- · Most important symptoms and effects, both acute and delayed No further relevant information available.
- · Indication of any immediate medical attention and special treatment needed No further relevant information available.

13.624%

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(Contd. of page 3)

5 Fire-fighting measures

- · Extinguishing media
- · Suitable extinguishing agents:

CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

· Special hazards arising from the substance or mixture

During heating or in case of fire poisonous gases are produced.

- · Advice for firefighters
- · Protective equipment: Mouth respiratory protective device.

6 Accidental release measures

· Personal precautions, protective equipment and emergency procedures

Mount respiratory protective device.

Wear protective equipment. Keep unprotected persons away.

· Environmental precautions:

Do not allow product to reach sewage system or any water course.

Inform respective authorities in case of seepage into water course or sewage system.

Dilute with plenty of water.

Do not allow to enter sewers/ surface or ground water.

· Methods and material for containment and cleaning up:

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

Use neutralizing agent.

Dispose contaminated material as waste according to section 13.

Ensure adequate ventilation.

· Reference to other sections

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

· Protective Action Criteria for Chemicals

PAC-1:		
CAS: 7647-01-0 Hyd	rochloric Acid	1.8 ppm
CAS: 10025-77-1 Ferr	ic Chloride Hexahydrate	15 mg/m^3
CAS: 64-19-7 Acet	ic Acid, Glacial	5 ppm
CAS: 7697-37-2 Nitr	ic Acid	0.16 ppm
CAS: 7664-93-9 Sulf	ıric Acid 96 - 98%	0.20 mg/m
PAC-2:		
CAS: 7647-01-0 Hyd	rochloric Acid	22 ppm
CAS: 10025-77-1 Ferr	ic Chloride Hexahydrate	39 mg/m³
CAS: 64-19-7 Acet	ic Acid, Glacial	35 ppm
CAS: 7697-37-2 Nitr	ic Acid	24 ppm
CAS: 7664-93-9 Sulf	ıric Acid 96 - 98%	8.7 mg/m
<i>PAC-3:</i>		
CAS: 7647-01-0 Hyd	rochloric Acid	100 ppm
CAS: 10025-77-1 Ferr	ic Chloride Hexahydrate	240 mg/m
CAS: 64-19-7 Acet	ic Acid, Glacial	250 ppm
CAS: 7697-37-2 Nitr	ic Acid	92 ppm

- US

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Trade name: Stainless Steel Etchant Solution

CAS: 7664-93-9 | Sulfuric Acid 96 - 98% | (Contd. of page 4) | 160 mg/m³

7 Handling and storage

- · Handling:
- · Precautions for safe handling

Ensure good ventilation/exhaustion at the workplace.

Open and handle receptacle with care.

Prevent formation of aerosols.

· Information about protection against explosions and fires:

Keep ignition sources away - Do not smoke.

Protect against electrostatic charges.

Keep respiratory protective device available.

- · Conditions for safe storage, including any incompatibilities
- · Storage:
- · Requirements to be met by storerooms and receptacles: No special requirements.
- · Information about storage in one common storage facility: Not required.
- · Further information about storage conditions: Keep receptacle tightly sealed.
- · Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

- · Additional information about design of technical systems: No further data; see section 7.
- $\cdot \textit{Control parameters}$
- · Components with limit values that require monitoring at the workplace:

The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit.

At this time, the remaining constituent has no known exposure limits.

CAS: 7647-01-0 Hydrochlorid	Acid	
NIOSH RECOMENDED EXP	LIMI Ceiling limit value: 7.0 mg/m3 mg/m³	
PEL	Ceiling limit value: 7 mg/m³, 5 ppm	
REL	Ceiling limit value: 7 mg/m³, 5 ppm	
TLV	Ceiling limit value: 2 ppm	
	A4	
CAS: 64-19-7 Acetic Acid, Glo	ıcial	
PEL	Long-term value: 25 mg/m³, 10 ppm	
REL	Short-term value: 37 mg/m³, 15 ppm	
	Long-term value: 25 mg/m³, 10 ppm	
TLV	Short-term value: 15 ppm	
	Long-term value: 10 ppm	
CAS: 7697-37-2 Nitric Acid		
PEL	Long-term value: 5 mg/m³, 2 ppm	
REL	Short-term value: 10 mg/m³, 4 ppm	
	Long-term value: 5 mg/m³, 2 ppm	
TLV	Short-term value: (4) NIC-0.025 ppm	
	Long-term value: (2) ppm NIC-A4	
	NIC-A4	(Contd. on page 6)

-US

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Trade name: Stainless Steel Etchant Solution

- · Additional information: The lists that were valid during the creation were used as basis.
- · Exposure controls
- · Personal protective equipment:
- · General protective and hygienic measures:

Keep away from foodstuffs, beverages and feed.

Immediately remove all soiled and contaminated clothing.

Wash hands before breaks and at the end of work.

Store protective clothing separately.

Avoid contact with the eyes.

Avoid contact with the eyes and skin.

· Breathing equipment:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

· Protection of hands:



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

· Penetration time of glove material

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

· Eye protection:



Tightly sealed goggles

· Body protection: Protective work clothing

9 Physical and chemical properties

- · Information on basic physical and chemical properties
- · General Information
- · Appearance:

Form: Liquid

Color: Clear water white

· Odor: Odorless

(Contd. on page 7)

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Trade name: Stainless Steel Etchant Solution

	(Contd. of page
· Odor threshold:	Not determined.
· pH-value:	Not determined.
· Change in condition Melting point/Melting range: Boiling point/Boiling range:	Undetermined. 83 °C (181.4 °F)
· Flash point:	40 °C (104 °F)
· Flammability:	Flammable.
· Decomposition temperature:	Not determined.
· Ignition temperature:	Product is not selfigniting.
· Danger of explosion:	Product is not explosive. However, formation of explosive air/vap mixtures are possible.
· Explosion limits: Lower: Upper:	4 Vol % 17 Vol %
· <i>Vapor pressure at 21 °C (69.8 °F):</i>	226.6 hPa (170 mm Hg)
 Density at 20 °C (68 °F): Relative density Vapor density Evaporation rate 	1.31009 g/cm³ (10.9327 lbs/gal) Not determined. Not determined. Not determined.
· Solubility in / Miscibility with Water:	Fully miscible.
· Partition coefficient (n-octanol/water	·): Not determined.
· Viscosity: Dynamic: Kinematic:	Not determined. Not determined.
· Solvent content:	
Organic solvents:	14.3 %
Water:	13.6 %
VOC content:	14.31 % 187.5 g/l / 1.56 lb/gal
Solids content:	15.0 %
· Other information	No further relevant information available.

10 Stability and reactivity

- · Reactivity No further relevant information available.
- · Chemical stability
- · Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- · Possibility of hazardous reactions No dangerous reactions known.
- · Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.

(Contd. on page 8)

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Trade name: Stainless Steel Etchant Solution

(Contd. of page 7)

· Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

- · Information on toxicological effects
- · Acute toxicity:

· LD/LC50 values that are relevant for classification:			
ATE (Acu	ATE (Acute Toxicity Estimate)		
Oral	LD50	6,012 mg/kg (rat)	
Dermal	<i>LD50</i>	7,408 mg/kg (rabbit)	
Inhalative	LC50/4h	22 mg/l	

- · Primary irritant effect:
- · on the skin: Strong caustic effect on skin and mucous membranes.
- · on the eye:

Strong caustic effect.

Strong irritant with the danger of severe eye injury.

- · Sensitization: Sensitization possible through skin contact.
- · Additional toxicological information:

The product shows the following dangers according to internally approved calculation methods for preparations: Corrosive

Irritant

Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.

· Carcinogenic categories

· IARC (Internation	onal Agency for Research on Cancer)	
CAS: 7664-93-9	Sulfuric Acid 96 - 98%	1
· NTP (National T	Toxicology Program)	
CAS: 7664-93-9	Sulfuric Acid 96 - 98%	K
· OSHA-Ca (Occupational Safety & Health Administration)		

12 Ecological information

None of the ingredients is listed.

- · Toxicity
- · Aquatic toxicity: No further relevant information available.
- · Persistence and degradability No further relevant information available.
- · Behavior in environmental systems:
- · Bioaccumulative potential No further relevant information available.
- · Mobility in soil No further relevant information available.
- · Additional ecological information:
- · General notes:

Water hazard class 1 (Self-assessment): slightly hazardous for water

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system. Must not reach bodies of water or drainage ditch undiluted or unneutralized.

- · Results of PBT and vPvB assessment
- · **PBT**: Not applicable.
- · vPvB: Not applicable.

(Contd. on page 9)

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Trade name: Stainless Steel Etchant Solution

· Other adverse effects No further relevant information available.

(Contd. of page 8)

13 Disposal considerations

- · Waste treatment methods
- · Recommendation:

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- · Uncleaned packagings:
- · Recommendation: Disposal must be made according to official regulations.
- · Recommended cleansing agent: Water, if necessary with cleansing agents.

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· UN-Number · DOT, IMDG, IATA	UN1760
· UN proper shipping name	
$\cdot DOT$	Corrosive liquids, n.o.s. (Hydrochloric Acid, Nitric Acid, Acetic
	Acid, Glacial
	, Sulfuric Acid)
· IMDG, IATA	CORROSIVE LIQUID, N.O.S. (Hydrochloric Acid, Nitric Acid,
	Acetic Acid, Glacial
	, Sulfuric Acid)

- · Transport hazard class(es)
- $\cdot DOT$



ClassLabel8 Corrosive substances8

· IMDG, IATA



· Class 8 Corrosive substances

· Label

· Packing group

· DOT, IMDG, IATA

• Environmental hazards: Not applicable.

· Special precautions for user Warning: Corrosive substances

· Hazard identification number (Kemler code): 83

• EMS Number: F-E,S-C

· Segregation groups (SGG18) Alkalis

· Stowage Category

(Contd. on page 10)

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Trade name: Stainless Steel Etchant Solution

	(Contd. of page
· Segregation Code	SG35 Stow "separated from" SGG1-acids
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
· Transport/Additional information:	
· DOT	
· Quantity limitations	On passenger aircraft/rail: 1 L
	On cargo aircraft only: 30 L
· IMDG	
· Limited quantities (LQ)	1L
· Excepted quantities (EQ)	Code: E2
	Maximum net quantity per inner packaging: 30 ml
	Maximum net quantity per outer packaging: 500 ml
· UN ''Model Regulation'':	UN 1760 CORROSIVE LIQUID, N.O.S. (HYDROCHLOR
Ŭ	ACID, NITRIC ACID, ACETIC ACID, GLACIAL
	, SULFURIC ACID), 8, II

15 Regulatory information

- · Safety, health and environmental regulations/legislation specific for the substance or mixture
- \cdot Sara

· Section 355 (extremely hazardous substances):				
CAS: 7697-37-2	Nitric Acid			
CAS: 7664-93-9	Sulfuric Acid 96 - 98%			
· Section 313 (Spe	ecific toxic chemical listings):			
CAS: 7697-37-2	Nitric Acid			
CAS: 7664-93-9	Sulfuric Acid 96 - 98%			
· TSCA (Toxic Substances Control Act):				
Hydrochloric Ac	id	ACTIVE		
Acetic Acid, Glad	Acetic Acid, Glacial ACTIVE			
Water ACTIV		ACTIVE		
Nitric Acid	Nitric Acid ACTIV			
Sulfuric Acid 96 - 98% ACTIVE				
· Hazardous Air Pollutants				
CAS: 7647-01-0	CAS: 7647-01-0 Hydrochloric Acid			

- · Proposition 65
- · Chemicals known to cause cancer:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed.

(Contd. on page 11)

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Trade name: Stainless Steel **Etchant Solution**

(Contd. of page 10)

· Chemicals known to cause developmental toxicity:

None of the ingredients is listed.

· Carcinogenic categories

· EPA (Environmental Protection Agency)

None of the ingredients is listed.

· TLV (Threshold Limit Value)

CAS: 7664-93-9 Sulfuric Acid 96 - 98%

A2

· NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

- · GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS).
- · Hazard pictograms







GHS07



GHS02

GHS05

· Signal word Danger

· Hazard-determining components of labeling:

Hydrochloric Acid

Acetic Acid, Glacial

Sulfuric Acid 96 - 98%

Nitric Acid

Ferric Chloride Hexahydrate

· Hazard statements

Flammable liquid and vapor.

Causes severe skin burns and eye damage.

May cause an allergic skin reaction.

May cause cancer.

May cause respiratory irritation.

May cause damage to organs through prolonged or repeated exposure.

· Precautionary statements

Obtain special instructions before use.

Do not handle until all safety precautions have been read and understood.

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

Ground/bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting/equipment.

Use only non-sparking tools.

Take precautionary measures against static discharge.

Do not breathe dusts or mists.

Wash thoroughly after handling.

Use only outdoors or in a well-ventilated area.

Contaminated work clothing must not be allowed out of the workplace.

Wear protective gloves/protective clothing/eye protection/face protection.

If swallowed: Rinse mouth. Do NOT induce vomiting.

If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Immediately call a poison center/doctor.

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Trade name: Stainless Steel Etchant Solution

(Contd. of page 11)

IF exposed or concerned: Get medical advice/attention.

Specific treatment (see on this label).

Get medical advice/attention if you feel unwell.

If skin irritation or rash occurs: Get medical advice/attention.

Wash contaminated clothing before reuse.

In case of fire: Use CO2, powder or water spray to extinguish. Store in a well-ventilated place. Keep container tightly closed.

Store in a well-ventilated place. Keep cool.

Store locked up.

Dispose of contents/container in accordance with local/regional/national/international regulations.

- · National regulations:
- · Information about limitation of use:

Workers are not allowed to be exposed to the hazardous carcinogenic materials contained in this preparation. Exceptions can be made by the authorities in certain cases.

· Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- · Department issuing SDS: Environment protection department.
- · Contact:

Date of Preparation / Last Revision:

· Date of preparation / last revision

Revision 1.2, 10-10-2024: Updated DOT infomation.. STN 10/10/2024 / -

· Abbreviations and acronyms:

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

NFPA: National Fire Protection Association (USA)

HMIS: Hazardous Materials Identification System (USA)

VOC: Volatile Organic Compounds (USA, EU)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

NIOSH: National Institute for Occupational Safety

OSHA: Occupational Safety & Health

TLV: Threshold Limit Value

PEL: Permissible Exposure Limit

REL: Recommended Exposure Limit

Flammable Liquids 3: Flammable liquids – Category 3

Skin Corrosion 1A: Skin corrosion/irritation – Category 1A

Eye Damage 1: Serious eye damage/eye irritation – Category 1

Sensitization - Skin 1: Skin sensitisation - Category 1 Carcinogenicity 1A: Carcinogenicity - Category 1A

Specific Target Organ Toxicity - Single Exposure 3: Specific target organ toxicity (single exposure) - Category 3

Specific Target Organ Toxicity - Repeated Exposure 2: Specific target organ toxicity (repeated exposure) - Category 2

* Data compared to the previous version altered.

IIS.