

Safety Data Sheet

acc. to OSHA HCS

Printing date 07/24/2024

Reviewed on 07/24/2024

1 Identification

- **Product identifier**
- **Trade name:** 25.0 mg/L 14 component
Mixed Metal Working Solution
- **Article number:** SAY005
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
Aqua Solutions, Inc.
6913 Highway 225
DEER PARK, TX 77536
USA
800-256-2586
- **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**



GHS08 Health hazard

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



GHS07

Skin Irritation 2

H315 Causes skin irritation.

Eye Irritation 2A

H319 Causes serious eye irritation.

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



GHS07



GHS08

- **Signal word** Warning
- **Hazard-determining components of labeling:**
Hydrochloric Acid
- **Hazard statements**
Causes skin irritation.
Causes serious eye irritation.
May cause damage to organs through prolonged or repeated exposure.
- **Precautionary statements**
Do not breathe dust/fume/gas/mist/vapors/spray.

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Wash thoroughly after handling.

Wear protective gloves / eye protection / face protection.

If on skin: Wash with plenty of water.

Specific treatment (see on this label).

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

Get medical advice/attention if you feel unwell.

Take off contaminated clothing and wash it before reuse.

If skin irritation occurs: Get medical advice/attention.

If eye irritation persists: Get medical advice/attention.

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

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



Health = 2

Fire = 0

Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = *2

Fire = 0

Reactivity = 0

· **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	2.343%
CAS: 7697-37-2	Nitric Acid	0.382%

· **Table of Nonhazardous Ingredients**

CAS: 7732-18-5	Water	96.476%
CAS: 12007-60-2	Lithium Tetraborate, Reagent	0.36%
CAS: 87-69-4	L-Tartaric Acid	0.248%
CAS: 7789-24-4	Lithium Fluoride	0.04%
CAS: 7784-27-2	Aluminum Nitrate	0.035%
CAS: 13446-18-9	Magnesium Nitrate	0.026%
CAS: 7782-61-8	Ferric Nitrate	0.018%
CAS: 16919-19-0	Ammonium hexafluorosilicate	0.016%
CAS: 7722-76-1	Ammonium Phosphate Monobasic	0.009%
CAS: 19004-19-4	Cupric Nitrate Hydrate	0.009%
CAS: 7631-99-4	Sodium Nitrate	0.009%
CAS: 7757-79-1	Potassium Nitrate	0.006%

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CAS: 471-34-1	Calcium Carbonate	0.006%
CAS: 1314-62-1	Vanadium Pentoxide Reagent	0.004%
CAS: 10099-74-8	Lead Nitrate	0.004%
CAS: 7440-02-0	Nickel Metal	0.003%
CAS: 7440-66-6	Zinc Metal	0.003%
CAS: 7440-38-2	arsenic	0.002%

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:** 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. If symptoms persist, consult a doctor.
- **After swallowing:** If symptoms persist consult 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.

5 Fire-fighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:** Use fire fighting measures that suit the environment.
- **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.
- **Environmental precautions:** 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).
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	Hydrochloric Acid	1.8 ppm
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CAS: 7697-37-2	Nitric Acid	0.16 ppm
CAS: 12007-60-2	Lithium Tetraborate, Reagent	4.3 mg/m ³
CAS: 87-69-4	L-Tartaric Acid	1.6 mg/m ³
CAS: 7789-24-4	Lithium Fluoride	10 mg/m ³
CAS: 7784-27-2	Aluminum Nitrate	83 mg/m ³
CAS: 13446-18-9	Magnesium Nitrate	16 mg/m ³
CAS: 7782-61-8	Ferric Nitrate	22 mg/m ³
CAS: 16919-19-0	Ammonium hexafluorosilicate	12 mg/m ³
CAS: 7722-76-1	Ammonium Phosphate Monobasic	17 mg/m ³
CAS: 19004-19-4	Cupric Nitrate Hydrate	42 mg/m ³
CAS: 7631-99-4	Sodium Nitrate	4.1 mg/m ³
CAS: 7757-79-1	Potassium Nitrate	9 mg/m ³
CAS: 471-34-1	Calcium Carbonate	45 mg/m ³
CAS: 1314-62-1	Vanadium Pentoxide Reagent	0.64 mg/m ³
CAS: 10099-74-8	Lead Nitrate	0.24 mg/m ³
CAS: 7440-02-0	Nickel Metal	4.5 mg/m ³
CAS: 7440-66-6	Zinc Metal	6 mg/m ³
CAS: 7440-38-2	arsenic	1.5 mg/m ³

· PAC-2:

CAS: 7647-01-0	Hydrochloric Acid	22 ppm
CAS: 7697-37-2	Nitric Acid	24 ppm
CAS: 12007-60-2	Lithium Tetraborate, Reagent	47 mg/m ³
CAS: 87-69-4	L-Tartaric Acid	17 mg/m ³
CAS: 7789-24-4	Lithium Fluoride	110 mg/m ³
CAS: 7784-27-2	Aluminum Nitrate	920 mg/m ³
CAS: 13446-18-9	Magnesium Nitrate	180 mg/m ³
CAS: 7782-61-8	Ferric Nitrate	110 mg/m ³
CAS: 16919-19-0	Ammonium hexafluorosilicate	130 mg/m ³
CAS: 7722-76-1	Ammonium Phosphate Monobasic	190 mg/m ³
CAS: 19004-19-4	Cupric Nitrate Hydrate	150 mg/m ³
CAS: 7631-99-4	Sodium Nitrate	45 mg/m ³
CAS: 7757-79-1	Potassium Nitrate	100 mg/m ³
CAS: 471-34-1	Calcium Carbonate	210 mg/m ³
CAS: 1314-62-1	Vanadium Pentoxide Reagent	7 mg/m ³
CAS: 10099-74-8	Lead Nitrate	180 mg/m ³
CAS: 7440-02-0	Nickel Metal	50 mg/m ³
CAS: 7440-66-6	Zinc Metal	40 mg/m ³
CAS: 7440-38-2	arsenic	17 mg/m ³

· PAC-3:

CAS: 7647-01-0	Hydrochloric Acid	100 ppm
CAS: 7697-37-2	Nitric Acid	92 ppm
CAS: 12007-60-2	Lithium Tetraborate, Reagent	280 mg/m ³

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CAS: 87-69-4	L-Tartaric Acid	100 mg/m ³
CAS: 7789-24-4	Lithium Fluoride	680 mg/m ³
CAS: 7784-27-2	Aluminum Nitrate	5,500 mg/m ³
CAS: 13446-18-9	Magnesium Nitrate	1,100 mg/m ³
CAS: 7782-61-8	Ferric Nitrate	640 mg/m ³
CAS: 16919-19-0	Ammonium hexafluorosilicate	780 mg/m ³
CAS: 7722-76-1	Ammonium Phosphate Monobasic	1,100 mg/m ³
CAS: 19004-19-4	Cupric Nitrate Hydrate	240 mg/m ³
CAS: 7631-99-4	Sodium Nitrate	270 mg/m ³
CAS: 7757-79-1	Potassium Nitrate	600 mg/m ³
CAS: 471-34-1	Calcium Carbonate	1,300 mg/m ³
CAS: 1314-62-1	Vanadium Pentoxide Reagent	70 mg/m ³
CAS: 10099-74-8	Lead Nitrate	1,100 mg/m ³
CAS: 7440-02-0	Nickel Metal	99 mg/m ³
CAS: 7440-66-6	Zinc Metal	240 mg/m ³
CAS: 7440-38-2	arsenic	100 mg/m ³

7 Handling and storage

- **Handling:**
- **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.
- **Information about protection against explosions and fires:** 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.
- **Control parameters**

· **Components with limit values that require monitoring at the workplace:**

CAS: 7647-01-0 Hydrochloric Acid

NIOSH RECOMENDED EXP LIM	Ceiling limit value: 7.0 mg/m ³ mg/m ³
PEL	Ceiling limit value: 7 mg/m ³ , 5 ppm
REL	Ceiling limit value: 7 mg/m ³ , 5 ppm
TLV	Ceiling limit value: 2 ppm
	A4

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CAS: 7697-37-2 Nitric Acid

PEL	Long-term value: 5 mg/m ³ , 2 ppm
REL	Short-term value: 10 mg/m ³ , 4 ppm Long-term value: 5 mg/m ³ , 2 ppm
TLV	Short-term value: (4) NIC-0.025 ppm Long-term value: (2) ppm NIC-A4

· **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 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: Colorless

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· Odor:	Odorless
· Odor threshold:	Not determined.
· pH-value:	Not determined.
· Change in condition	
Melting point/Melting range:	0 °C (32 °F)
Boiling point/Boiling range:	100 °C (212 °F)
· Flash point:	Not applicable.
· Flammability (solid, gaseous):	Not applicable.
· Decomposition temperature:	Not determined.
· Ignition temperature:	Product is not selfigniting.
· Danger of explosion:	Product does not present an explosion hazard.
· Explosion limits:	
Lower:	Not determined.
Upper:	Not determined.
· Vapor pressure at 20 °C (68 °F):	23 hPa (17.3 mm Hg)
· Density at 20 °C (68 °F):	1.00597 g/cm ³ (8.39482 lbs/gal)
· Relative density	Not determined.
· Vapor density	Not determined.
· Evaporation rate	Not determined.
· Solubility in / Miscibility with Water:	Not miscible or difficult to mix.
· Partition coefficient (n-octanol/water):	Not determined.
· Viscosity:	
Dynamic:	Not determined.
Kinematic:	Not determined.
· Solvent content:	
Water:	96.5 %
VOC content:	0.00 % 0.0 g/l / 0.00 lb/gal
Solids content:	0.7 %
· 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.
- **Hazardous decomposition products:** No dangerous decomposition products known.

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11 Toxicological information

- **Information on toxicological effects**
- **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**

ATE (Acute Toxicity Estimate)

Inhalative	LC50/4h	785 mg/l
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- **Primary irritant effect:**

- **on the skin:** Irritant to skin and mucous membranes.
- **on the eye:** Irritating effect.

- **Sensitization:** No sensitizing effects known.

- **Additional toxicological information:**

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

- **Carcinogenic categories**

- **IARC (International Agency for Research on Cancer)**

CAS: 7789-24-4	Lithium Fluoride	3
CAS: 1314-62-1	Vanadium Pentoxide Reagent	2B
CAS: 10099-74-8	Lead Nitrate	2A
CAS: 7440-02-0	Nickel Metal	2B
CAS: 7440-38-2	arsenic	1

- **NTP (National Toxicology Program)**

CAS: 10099-74-8	Lead Nitrate	R
CAS: 7440-02-0	Nickel Metal	R
CAS: 7440-38-2	arsenic	K

- **OSHA-Ca (Occupational Safety & Health Administration)**

CAS: 7440-38-2	arsenic	
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12 Ecological information

- **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.

- **Results of PBT and vPvB assessment**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

· **Other adverse effects** No further relevant information available.

US

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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.

14 Transport information

· UN-Number	
· DOT, IMDG, IATA	Not regulated
· UN proper shipping name	
· DOT, IMDG, IATA	Not regulated
· Transport hazard class(es)	
· DOT, ADN, IMDG, IATA	
· Class	Not regulated
· Packing group	
· DOT, IMDG, IATA	Not regulated
· Environmental hazards:	Not applicable.
· Special precautions for user	Not applicable.
· Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
· UN "Model Regulation":	Not regulated

* 15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**
No further relevant information available.
- **Sara**

· Section 355 (extremely hazardous substances):	
CAS: 7697-37-2	Nitric Acid
CAS: 1314-62-1	Vanadium Pentoxide Reagent
· Section 313 (Specific toxic chemical listings):	
CAS: 7697-37-2	Nitric Acid
CAS: 7784-27-2	Aluminum Nitrate
CAS: 13446-18-9	Magnesium Nitrate
CAS: 7782-61-8	Ferric Nitrate
CAS: 7757-79-1	Potassium Nitrate
CAS: 1314-62-1	Vanadium Pentoxide Reagent
CAS: 10099-74-8	Lead Nitrate
CAS: 7440-02-0	Nickel Metal

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CAS: 7440-66-6	Zinc Metal	
CAS: 7440-38-2	arsenic	
· TSCA (Toxic Substances Control Act):		
Water		ACTIVE
Hydrochloric Acid		ACTIVE
Nitric Acid		ACTIVE
Lithium Tetraborate, Reagent		ACTIVE
L-Tartaric Acid		ACTIVE
Lithium Fluoride		ACTIVE
Ammonium hexafluorosilicate		ACTIVE
Ammonium Phosphate Monobasic		ACTIVE
Sodium Nitrate		ACTIVE
Potassium Nitrate		ACTIVE
Calcium Carbonate		ACTIVE
Vanadium Pentoxide Reagent		ACTIVE
Lead Nitrate		ACTIVE
Nickel Metal		ACTIVE
Zinc Metal		ACTIVE
arsenic		ACTIVE
· Hazardous Air Pollutants		
CAS: 7647-01-0	Hydrochloric Acid	
CAS: 10099-74-8	Lead Nitrate	
· Proposition 65		
· Chemicals known to cause cancer:		
CAS: 1314-62-1	Vanadium Pentoxide Reagent	
CAS: 10099-74-8	Lead Nitrate	
CAS: 7440-02-0	Nickel Metal	
CAS: 7440-38-2	arsenic	
· 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.		
· Chemicals known to cause developmental toxicity:		
None of the ingredients is listed.		
· Carcinogenic categories		
· EPA (Environmental Protection Agency)		
CAS: 12007-60-2	Lithium Tetraborate, Reagent	I (oral)
CAS: 10099-74-8	Lead Nitrate	B2
CAS: 7440-66-6	Zinc Metal	D, I, II
CAS: 7440-38-2	arsenic	A
· TLV (Threshold Limit Value)		
CAS: 7789-24-4	Lithium Fluoride	A4

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CAS: 1314-62-1	Vanadium Pentoxide Reagent	A3
CAS: 10099-74-8	Lead Nitrate	A3
CAS: 7440-02-0	Nickel Metal	A5
CAS: 7440-38-2	arsenic	A1

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

CAS: 7440-02-0	Nickel Metal
CAS: 7440-38-2	arsenic

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

· **Hazard pictograms**



GHS07 GHS08

· **Signal word** Warning

· **Hazard-determining components of labeling:**

Hydrochloric Acid

· **Hazard statements**

Causes skin irritation.

Causes serious eye irritation.

May cause damage to organs through prolonged or repeated exposure.

· **Precautionary statements**

Do not breathe dust/fume/gas/mist/vapors/spray.

Wash thoroughly after handling.

Wear protective gloves / eye protection / face protection.

If on skin: Wash with plenty of water.

Specific treatment (see on this label).

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

Continue rinsing.

Get medical advice/attention if you feel unwell.

Take off contaminated clothing and wash it before reuse.

If skin irritation occurs: Get medical advice/attention.

If eye irritation persists: Get medical advice/attention.

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

· **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 07/24/2024: Reviewed SDS for accuracy. MH/STN

07/24/2024 / 1.0

· **Abbreviations and acronyms:**

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

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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

Skin Irritation 2: Skin corrosion/irritation – Category 2

Eye Irritation 2A: Serious eye damage/eye irritation – Category 2A

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

· *** Data compared to the previous version altered.**

US