SAFETY DATA SHEET

1. IDENTIFICATION

Product identifier

Product code: H1041
Product Name: HYDROCHLORIC ACID, 37 PERCENT, ELECTRONIC/CLEANROOM GRADE

Other means of identification

Synonyms: Muriatic Acid; Chlorohydric acid; Spirits of salt; Acide chlorhydrique (French)

CAS #: 7647--01-0
RTECS #: MW4025000
CI#: Not available

Recommended use of the chemical and restrictions on use

Recommended use: In the production of chloride; refining ore in the production of tin and tantalum; for the neutralization of basic systems; as a laboratory reagent; as a catalyst and solvent in organic synthesis; for oil and gas-well treatment; in removing scale from boilers and heat exchange equipment; pharmaceutical aid (acidifier); in the manufacture of phosphoric acid and in the production of ammonium chloride; metal treating agent (steel pickling); in food processing as a starch modifier; in the manufacturer of sodium glutamate; in the manufacturer of gelatin; in the conversion of cornstarch to syrup; in the brewing industry; in sugar refining; in the manufacture of fertilizers, dyes and dyestuffs, artificial silks, pigments for paints; in electroplating, leather tanning, the photographic industry, in soap refining, in the textile industry, in the rubber industry; in petroleum activation; metal cleaning operations; recovery of zinc from galvanized iron scrap.

Uses advised against

No information available

Supplier: Spectrum Chemical Mfg. Corp
14422 South San Pedro St.
Gardena, CA 90248
(310) 516-8000

Order Online At: https://www.spectrumchemical.com

Emergency telephone number: Chemtrec 1-800-424-9300

Contact Person: Tom Tyner (USA - West Coast)

Contact Person: Ibad Tirmiz (USA - East Coast)

2. HAZARDS IDENTIFICATION

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Considered a dangerous substance or mixture according to the Globally Harmonized System (GHS)
Acute toxicity - Oral Category 4
Acute toxicity - Inhalation (Gases) Category 4
Skin corrosion/irritation Category 1 Sub-category A
Serious eye damage/eye irritation Category 1
Specific target organ toxicity (single exposure) Category 3
Corrosive to metals Category 1

Label elements

Danger

Hazard statements
Harmful if swallowed
Harmful if inhaled
Causes severe skin burns and eye damage
May cause respiratory irritation
May be corrosive to metals

Hazard Class: Corrosive to metals Category 1

Product code: H1041
Product name: HYDROCHLORIC ACID, 37 PERCENT, ELECTRONIC/CLEANROOM GRADE

Precautionary Statements - Prevention
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Use only outdoors or in a well-ventilated area
Do not breathe dust/fume/gas/mist/vapors/spray
Wear protective gloves/protective clothing/eye protection/face protection
Keep only in original container

Precautionary Statements - Response
Immediately call a POISON CENTER or physician
Absorb spillage to prevent material damage
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 or physician.
If ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water
Wash contaminated clothing before reuse
If INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. Immediately call a POISON CENTER or physician.
If SWALLOWED: Call a POISON CENTER or physician if you feel unwell
Rinse mouth
Do NOT induce vomiting
Precautionary Statements - Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed

Precautionary Statements - Disposal
Dispose of contents and container to an approved waste disposal plant in accordance with local, regional, national and international regulations as applicable

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No</th>
<th>Weight-%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>62-64</td>
</tr>
<tr>
<td>Hydrogen chloride</td>
<td>7647-01-0</td>
<td>36-38</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

First aid measures

General Advice: National Capital Poison Center in the United States can provide assistance if you have a poison emergency and need to talk to a poison specialist. Call 1-800-222-1222. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. First aider needs to protect himself.

Skin Contact: Wash off immediately with soap and plenty of water. Continue flushing with plenty of water for at least 15 minutes. Remove all contaminated clothes and shoes. Immediate medical attention is required. Call a physician immediately.

Eye Contact: Flush eyes with water for 15 minutes. Immediate medical attention is required. Call a physician immediately.

Inhalation: Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. WARNING! It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled or ingested material is toxic, infectious or corrosive. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediate medical attention is required. Call a physician immediately.

Ingestion: Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. If victim is conscious, give water or milk. Do not give Sodium Bicarbonate (Baking Soda). Immediate medical attention is required. Call a physician or Poison Control Center immediately.

Most important symptoms and effects, both acute and delayed

Symptoms
Severe skin and eye irritation or burns
Irritating to respiratory system
Burning sensation of the respiratory tract
Coughing
Hoarseness of the voice
Choking sensation
Dyspnea (Shortness of breath and difficulty breathing)
Shallow respiration
Can burn mouth, throat, and stomach
May cause abdominal pain, nausea, vomiting, diarrhea
May cause perforation of the digestive tract
May cause salivation
Thirst
May cause difficulty swallowing

Product code: H1041 Product name: HYDROCHLORIC ACID, 37 PERCENT, ELECTRONIC/CLEANROOM GRADE
Discoloration and excessive decay of teeth
Weak, rapid pulse or rapid heart rate (Tachycardia)
Shock
It may affect the kidneys
May cause chemical burns to the respiratory tract
May cause inflammation of the lungs (pneumonitis)
May cause inflammation and edema of the larynx and bronchi

Indication of any immediate medical attention and special treatment needed

Notes to Physician: Treat symptomatically.

Protection of first-aiders
First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste.

5. FIRE-FIGHTING MEASURES

Extinguishing Media
Suitable Extinguishing Media: The product is not flammable. If it is involved in a fire, extinguish the fire using an agent suitable for the type of surrounding fire.

Unsuitable Extinguishing Media: No information available.

Specific hazards arising from the chemical

Hazardous combustion products
Specific hazards
Contact with metals may evolve flammable hydrogen gas. Calcium carbide reacts with hydrogen chloride gas with incandescence. Uranium phosphide reacts with hydrochloric acid to release spontaneously flammable phosphine. Rubidium acetylene carbide burns with slightly warm Hydrochloric acid. Lithium silicide in contact with hydrogen chloride becomes incandescent. When dilute hydrochloric acid is used, gas that is spontaneously flammable in air is evolved. Magnesium boride treated with concentrated hydrochloric acid produces spontaneously flammable gas. Cesium acetylene carbide burns in hydrogen chloride gas. Cesium carbide ignites in contact with Hydrochloric acid unless acid is dilute. Hydrogen chloride in contact with the following can cause an explosion or ignition on contact, or other violent/vigorous reaction: Acetic anhydride AgClO + CCl4 Alcohols + hydrogen cyanide, Aluminum Aluminum-titanium alloys (with HCl vapor), 2-Amino ethanol, Ammonium hydroxide, Calcium carbide Ca3P2 Chlorine + dinitroanilines (evolves gas), Chlorosulfonic acid Cesium carbide Cesium acetylene carbide, 1,1-Difluoroethylene Ethylenediamine, Ethyleneimine, Fluorine, HClO4 Hexalithium disilicide H2SO4 Metal acetyldes or carbides, Magnesium boride, Mercuric sulfate, Oleum, Potassium permanganate, beta-Propiolactone Propylene oxide Rubidium carbide, Rubidium, acetylene carbide Sodium (with aqueous HCl), Sodium hydroxide Sodium tetraselenium, Sulfonic acid, Tetraselenium tetranitride, U3P4 , Vinyl acetate. Silver

Product code: H1041 Product name: HYDROCHLORIC ACID, 37 PERCENT, ELECTRONIC/CLEANROOM GRADE
perchlorate with carbon tetrachloride in the presence of hydrochloric acid produces trichloromethyl perchlorate which detonates at 40 deg. C.

**Special Protective Actions for Firefighters**

**Specific Methods:**
No information available

**Special Protective Equipment for Firefighters:**
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

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**6. ACCIDENTAL RELEASE MEASURES**

**Personal precautions, protective equipment and emergency procedures**

**Personal Precautions:**
Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Use personal protective equipment. Avoid contact with skin, eyes and clothing.

**Environmental precautions**
Prevent further leakage or spillage if safe to do so. Should not be released into the environment. Do not let product enter drains. Do not flush into surface water or sanitary sewer system. Prevent entry into waterways, sewers, basements or confined areas.

**Methods and material for containment and cleaning up**

**Methods for containment**
Stop leak if you can do it without risk.

**Methods for cleaning up**
Neutralize with Sodium carbonate or Sodium bicarbonate. Dilute with water. Absorb spill with inert material (e.g. vermiculite, dry sand or earth), then place in a suitable chemical waste container. Clean contaminated surface thoroughly.

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**7. HANDLING AND STORAGE**

**Precautions for safe handling**

**Technical Measures/Precautions:**
Use only in area provided with appropriate exhaust ventilation. Keep away from incompatible materials.

**Safe Handling Advice:**
Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Do not ingest. Do not breathe vapors or spray mist. Handle in accordance with good industrial hygiene and safety practice.

**Conditions for safe storage, including any incompatibilities**

**Technical Measures/Storage Conditions:**
Keep container tightly closed in a dry and well-ventilated place. Store at room temperature in the original container. May corrode metallic surfaces. Do not store in uncoated metallic containers. Store in a segregated and approved area. Store away from incompatible materials.

**Incompatible Materials:**
- Oxidizing agents
- Metals
- Alkalis
- Organic materials
- Water

---

**Product code:** H1041

**Product name:** HYDROCHLORIC ACID, 37 PERCENT, ELECTRONIC/CLEANROOM GRADE
8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

National occupational exposure limits

United States

<table>
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<tr>
<th>Component</th>
<th>CAS No</th>
<th>OSHA</th>
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<tr>
<td>Hydrogen chloride</td>
<td>7647-01-0</td>
<td>5 ppm Ceiling</td>
<td>5 ppm Ceiling</td>
<td>2 ppm Ceiling</td>
<td>None</td>
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Canada

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<th>Component</th>
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<th>Canada - British Columbia</th>
<th>Canada - Ontario</th>
<th>Canada - Quebec</th>
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<tr>
<td>Hydrogen chloride</td>
<td>7647-01-0</td>
<td>2 ppm Ceiling</td>
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Australia and Mexico

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<th>Mexico</th>
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</tr>
<tr>
<td>Hydrogen chloride</td>
<td>7647-01-0</td>
<td>None</td>
<td>5 ppm Ceiling</td>
</tr>
</tbody>
</table>

Appropriate engineering controls

Engineering measures to reduce exposure: Ensure adequate ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors and mist below their respective threshold limit value.

Individual protection measures, such as personal protective equipment

Personal Protective Equipment

Eye protection: Face-shield. and Goggles

Skin and body protection: Chemical resistant protective suit
Gloves
Boots

Respiratory protection: Vapor respirator. Be sure to use an approved/certified respirator or equivalent.

Hygiene measures: Avoid contact with skin, eyes and clothing. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

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<tr>
<td>Appearance: No information available.</td>
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<tr>
<td>Color: Colorless. Light yellow.</td>
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<tr>
<td>Odor: Pungent. Irritating.</td>
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<tr>
<td>Taste: No information available.</td>
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<tr>
<td>Formula: HCl</td>
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Product code: H1041
Product name: HYDROCHLORIC ACID, 37 PERCENT, ELECTRONIC/CLEANROOM GRADE
10. STABILITY AND REACTIVITY

Reactivity
For Hydrogen chloride or concentrated Hydrochloric Acid:
Reacts with most metals to produce flammable Hydrogen gas.
Sodium reacts very violently with gaseous hydrogen chloride.
Calcium phosphide and Hydrochloric acid undergo a very energetic reaction.
Hydrogen chloride reacts with oxidizers releasing chlorine gas.
Hydrogen chloride gas is emitted when Hydrochloric acid comes in contact with Sulfuric acid.
Adsorption of Hydrochloric acid onto Silicon dioxide results in exothermic reaction.
Hydrogen chloride causes aldehydes and epoxides to violently polymerize.
Reacts violently with bases, oxidizers forming toxic chlorine gas.
Reacts, often violently or vigorously or exothermically, with acetic anhydride, active metals, aliphatic amines, alkanolamines, alkylene oxides, aromatic amines, amides, 2-aminoethanol, ammonia, ammonium hydroxide, calcium phosphate, chlorosulfonic acid, ethylene diamine, ethyleneimine, epichlorhydrin, isocyanates, metal acetylides, oleum, organic anhydrides, perchloric acid, 3-propiolactone, uranium phosphate, sulfuric acid, vinyl acetate, vinylidene fluoride, alcohols + hydrogen cyanide, Aluminum phosphide, Aluminum-titanium alloys, 2-Amino ethanol, Ammonium hydroxide, Ammonium, 1,4-Benzoxquinone diimine, Cesium telluroacylated, Chlorine + dinitroanilines, Chloroacetaldehyde oxime, Cyanogen chloride, 1,1-Difluoroethylene, dinitroanilines, Ethylene, Ethyl 2-formylpropionate oxime, Hexalithium disilicide, Hydrogen peroxide, Methyl vinyl ether, Nitric acid + glycerol, Potassium, Potassium permanganate, beta-Propiolactone, Propylene oxide, Rubidium acetylide, Silver chlorite, Sodium 2-allyloxy-6-nitrophenoxyurate oxime, Sodium hydroxide, Sodium teranitride, 2,4,6-Tri(2-acetylhazrino)-1,3,5-trinitrobenzene, Sulfonic acid, Cesium cyanotridehydrodecaborate(2-), Potassium ferricyanide, Vinylidene fluoride, Potassium ferrocyanide, Ammonium hexacyanoferrate (II).

Molecular/Formula weight (g/mole): No information available
Flammability (solid, gas): no data available
Flashpoint (°C/°F): No information available

Autoignition Temperature (°C/°F): No information available
Lower Explosion Limit (%): No information available

Upper Explosion Limit (%): No information available
Melting point/range(°C/°F): -62.25°C (-80°F) (20.69% HCl in water)
-46.2 C (31.24% HCl in water)
-25.4 C (39.17% HCl in water)

Boiling point/range(°C/°F):
108.58 C @ 760 mm Hg (for 20.22% HCl in water)
83 C @ 760 mm Hg (for 31% HCl in water)
50.5 C (for 37% HCl in water)

Specific gravity:
1.1 - 1.19 (Water = 1)
1.10 (20% and 22% HCl solutions)
1.12 (24% HCl solution)
1.15 (29.57% HCl solution)
1.16 (32% HCl solution)
1.186 - 1.19 (37% and 38%HCl solutions)

Evaporation rate:
No information available

Odor threshold (ppm):
0.25 to 10 ppm

Miscibility:
No information available

Solubility:
Soluble in Ether
Soluble in Water

10. STABILITY AND REACTIVITY

Reactivity
For Hydrogen chloride or concentrated Hydrochloric Acid:
Reacts with most metals to produce flammable Hydrogen gas.
Sodium reacts very violently with gaseous hydrogen chloride.
Calcium phosphide and Hydrochloric acid undergo a very energetic reaction.
Hydrogen chloride reacts with oxidizers releasing chlorine gas.
Hydrogen chloride gas is emitted when Hydrochloric acid comes in contact with Sulfuric acid.
Adsorption of Hydrochloric acid onto Silicon dioxide results in exothermic reaction.
Hydrogen chloride causes aldehydes and epoxides to violently polymerize.
Reacts violently with bases, oxidizers forming toxic chlorine gas.
Reacts, often violently or vigorously or exothermically, with acetic anhydride, active metals, aliphatic amines, alkanolamines, alkylene oxides, aromatic amines, amides, 2-aminoethanol, ammonia, ammonium hydroxide, calcium phosphate, chlorosulfonic acid, ethylene diamine, ethyleneimine, epichlorhydrin, isocyanates, metal acetylides, oleum, organic anhydrides, perchloric acid, 3-propiolactone, uranium phosphate, sulfuric acid, vinyl acetate, vinylidene fluoride, alcohols + hydrogen cyanide, Aluminum phosphide, Aluminum-titanium alloys, 2-Amino ethanol, Ammonium hydroxide, Ammonium, 1,4-Benzoxquinone diimine, Cesium telluroacylated, Chlorine + dinitroanilines, Chloroacetaldehyde oxime, Cyanogen chloride, 1,1-Difluoroethylene, dinitroanilines, Ethylene, Ethyl 2-formylpropionate oxime, Hexalithium disilicide, Hydrogen peroxide, Methyl vinyl ether, Nitric acid + glycerol, Potassium, Potassium permanganate, beta-Propiolactone, Propylene oxide, Rubidium acetylide, Silver chlorite, Sodium 2-allyloxy-6-nitrophenoxyurate oxime, Sodium hydroxide, Sodium teranitride, 2,4,6-Tri(2-acetylhazrino)-1,3,5-trinitrobenzene, Sulfonic acid, Cesium cyanotridehydrodecaborate(2-), Potassium ferricyanide, Vinylidene fluoride, Potassium ferrocyanide, Ammonium hexacyanoferrate (II).
Reaction with oxidizers such as permanganates, chlorates, chlorites, and hypochlorites may produce chlorine or bromine gas.
Reacts vigorously with alkalies and with many organic materials.
Cesium acetylene carbide burns in hydrogen chloride gas.
Lithium silicide in contact with hydrogen chloride becomes incandescent.
Magnesium boride in contact with concentrated hydrochloric acid produces spontaneously flammable gas.
Rubidium acetylene carbide burns with slightly warm hydrochloric acid.
Rubidium carbide ignites in contact with hydrochloric acid unless acid is dilute.
Uranium phosphide reacts with hydrochloric acid to release spontaneously flammable phosphine.
Calcium carbide reacts with hydrogen chloride gas with incandescence.
Absorption of gaseous hydrogen chloride on mercuric sulfate becomes violent @ 125 deg C.
Reaction of silver perchlorate with carbon tetrachloride in presence of small amount of hydrochloric acid produces trichloromethyl perchlorate, which detonates @ 40 deg C.
Cesium carbide ignites in contact with hydrochloric acid unless acid is dilute.
Hydrochloric acid in the presence of alcohol and glycols results in dehydration reactions.
Hydrogen chloride gas can react with formaldehyde to form bis(chloromethyl)ether, a human carcinogen.
Exothermic reaction with water
Attacks some plastics, rubber, and coatings.

**Chemical stability**

**Stability:** Stable under recommended storage conditions.

**Possibility of Hazardous Reactions:** Hazardous polymerization does not occur

**Conditions to avoid:** Stable at normal conditions.

**Incompatible Materials:** Oxidizing agents
Metals
Alkalis
Organic materials
Water

**Hazardous decomposition products:** Hydrogen chloride gas. Hydrogen. Hydrogen, by reaction with metals.

**Other Information**

**Corrosivity:**
Severe corrosive effect on 304 Stainless Steel
Severe corrosive effect on 316 Stainless Steel
Severe corrosive effect on Copper and copper alloys
Severe corrosive effect on Bronze
Severe corrosive effect on Brass

**Special Remarks on Corrosivity:** No information available

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**11. TOXICOLOGICAL INFORMATION**

**Information on likely routes of exposure**

**Principal Routes of Exposure:** Skin. Inhalation. Ingestion.

**Acute Toxicity**

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (inhalation-gas) 4115-7810 ppm; (4-hr)

**Component Information**

**Product code:** H1041
**Product name:** HYDROCHLORIC ACID, 37 PERCENT, ELECTRONIC/CLEANROOM GRADE

**Page:** 8 / 16
Water
Cas No: 7732-18-5
LD50/oral/rat = > 90 mL/kg Oral LD50 Rat
LD50/oral/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available
Other LD50 or LC50 information = No information available

Hydrogen chloride
Cas No: 7647-01-0
LD50/oral/rat = 238 - 277 mg/kg Oral LD50 Rat
700 mg/kg (test substance: 31.5% hydrochloric acid solution)
LD50/oral/mouse = No information available
LD50/dermal/rabbit = >5010 mg/kg (Test substance: 31.5% hydrochloric acid solution - from European Chemicals Bureau IUCLID dataset)
LD50/dermal/rat = No information available
LC50/inhalation/rat = 3124 ppm Inhalation LC50 Rat 1 h
1562 ppm 4 h
1.68 mg/L Inhalation LC50 Rat 1h
LC50/inhalation/mouse = 1108 ppm 1 h
Other LD50 or LC50 information = 900 mg/kg oral LD50 Rabbit (no information on test substance)

Product Information

LD50/oral/rat =
Value - Acute Toxicity = 700 mg/kg

LD50/oral/mouse =
Value - Acute Tox = No information available

LD50/dermal/rabbit
Value - Acute Toxicity = > 5010 mg/kg

LD50/dermal/rat
VALUE - Acute Tox = No information available

LC50/inhalation/rat
VALUE - Vapor = No information available
VALUE - Gas = No information available
VALUE - Dust/Mist = No information available

LC50/Inhalation/mouse
VALUE - Vapor = No information available
VALUE - Gas = No information available
VALUE - Dust/Mist = No information available

Symptoms
Skin Contact: Causes severe irritation and burns.
Eye Contact: Causes severe irritation and burns.
Inhalation Harmful by inhalation. Hydrochloric acid is extremely destructive to tissue of the mucous membranes and upper respiratory tract. Inhalation of hydrochloric acid

Product code: H1041 Product name: HYDROCHLORIC ACID, 37 PERCENT, ELECTRONIC/CLEANROOM GRADE
Inhalation of high concentrations can result in corrosive burns, necrosis of bronchial epithelium, constriction of the larynx and bronchi, nasoseptal perforation, glottal closure, dyspnea, bronchitis. Chemical pneumonitis and pulmonary edema can also occur, particularly if exposure is prolonged. May affect the liver.

**Ingestion**

Harmful if swallowed. Causes irritation and burning, ulceration, or perforation of the gastrointestinal tract and resultant peritonitis, gastric hemorrhage and infection. Can also cause nausea, vomiting (with "coffee ground" emesis), diarrhea, thirst, difficulty swallowing, salivation, chills, fever, uneasiness, shock, strictures and stenosis (esophageal, gastric, pyloric). May affect behavior (excitement), the cardiovascular system (weak rapid pulse, tachycardia), respiration (shallow respiration), and urinary system (kidneys- renal failure, nephritis). Acute ingestion can also cause erosion of tooth enamel.

**Aspiration hazard**

No information available.

**Delayed and immediate effects as well as chronic effects from short and long-term exposure**

**Chronic Toxicity**

Prolonged or repeated inhalation and/or ingestion may affect liver, and cause bleeding of nose and gums, nasal and oral mucosal ulceration, conjunctivitis. It may also affect respiratory tract (changes in pulmonary function, chronic bronchitis, overt respiratory tract abnormalities), teeth (yellowing of teeth and erosion of tooth enamel), kidneys, and behavior/central nervous system (muscle contraction or spasticity). Prolonged or repeated skin contact may cause dermatitis. Prolonged or repeated eye contact with vapor/mist can cause conjunctivitis.

**Sensitization:**

No information available.

**Mutagenic Effects:**

Animal experiments showed mutagenic effects

Cytogenetic Analysis - chromosome aberration test (Chinese Hamster ovary):

Genotoxic effects were observed

**Carcinogenic effects:**

Not considered carcinogenic.

<table>
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<tr>
<th>Component</th>
<th>CAS No</th>
<th>IARC</th>
<th>ACGIH - Carcinogens</th>
<th>NTP</th>
<th>OSHA HCS - Carcinogens</th>
<th>Australia - Notifiable Carcinogenic Substances</th>
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<td>Not listed</td>
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</table>

**ACGIH (American Conference of Governmental Industrial Hygienists)**

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

**NTP (National Toxicology Program)**

**OSHA (Occupational Safety and Health Administration of the US Department of Labor)**

**Reproductive toxicity**

No data is available

**Product code:** H1041

**Product name:** HYDROCHLORIC ACID, 37 PERCENT, ELECTRONIC/CLEANROOM GRADE

Page 10 / 16
Reproductive Effects:  No information available
Developmental Effects:  No information on developmental toxicity effects on humans was found
An increase in postnatal mortality was seen in experiments where rats were exposed to Hydrogen Chloride for 1 hour
Teratogenic Effects:  No information available

Specific Target Organ Toxicity

STOT - single exposure  No information available.
STOT - repeated exposure  No information available.
Target Organs:  Skin. Eyes. Respiratory system.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects:  Aquatic environment.
Hydrogen chloride - 7647-01-0
Fish  282 mg/L LC50 Gambusia affinis 96 h
      862 mg/L LC50 Leuciscus idus
Crustacea  <56 mg/L LC50 Daphnia magna 72h
Persistence and degradability:  No information available
Bioaccumulative potential:  No information available.
Mobility in soil  No information available
Other adverse effects  No information available.

13. DISPOSAL CONSIDERATIONS

Disposal Methods

Waste from residues / unused products:  Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:  Empty containers should be taken for local recycling, recovery or waste disposal

<table>
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<th></th>
<th></th>
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<td>Hydrogen chloride</td>
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14. TRANSPORT INFORMATION

DOT

UN-No:  UN1789
Proper Shipping Name:  Hydrochloric acid, solution
Hazard Class  8
Subsidiary Class  No information available
Packing group:  II

Product code:  H1041   Product name:  HYDROCHLORIC ACID, 37 PERCENT, ELECTRONIC/CLEANROOM GRADE
Emergency Response Guide

Number

Marine Pollutant: No data available

DOT RQ (lbs): 5,000 lbs./2270 kg

Special Provisions: A3, A6, B3, B15, IB2, N41, T8, TP2

Symbol(s): [DOT]: (R5) - Identifies a material that is a hazardous substance that has a reportable quantity (RQ) of 5000 pounds (2270 Kilograms).

Description: UN1789, Hydrochloric acid solution, 8, II

TDG (Canada)

UN-No: UN1789

Proper Shipping Name: Hydrochloric acid, solution

Hazard Class: 8

Subsidiary Risk: No information available

Packing Group: II

Marine Pollutant: No Information available

Description: UN1789, Hydrochloric acid solution, 8, II

ADR

UN Number: UN1789

Proper Shipping Name: Hydrochloric acid, solution

Transport hazard class(es): 8

Packing group: II

Subsidiary Risk: No information available

Special Provisions: 520

Description: UN1789, Hydrochloric acid solution, 8, II

IMDG

UN-No: UN1789

Proper Shipping Name: Hydrochloric acid, solution

Hazard Class: 8

Subsidiary Risk: No information available

Packing Group: II

Marine Pollutant: No information available

EMS: F-A

Description: UN1789, Hydrochloric acid solution, 8, II

RID

UN Number: UN1789

Proper Shipping Name: Hydrochloric acid, solution

Transport hazard class(es): 8

Subsidiary Risk: 8

Packing group: II

Special Provisions: 520

Description: UN1789, Hydrochloric acid solution, 8, II

ICAO (air)

UN-No: UN1789

Proper Shipping Name: Hydrochloric acid, solution

Hazard Class: 8

Subsidiary Risk: No information available

Packing Group: II

Description: UN1789, Hydrochloric acid solution, 8, II

Special Provisions: A3

IATA

UN Number: UN1789

Product code: H1041

Product name: HYDROCHLORIC ACID, 37 PERCENT, ELECTRONIC/CLEANROOM GRADE
Proper Shipping Name: Hydrochloric acid, solution
Transport hazard class(es) 8
Subsidiary Risk: No information available
Packing group II
Precautionary Statements - Response 8L
Special Provisions No information available
Description: UN1789, Hydrochloric acid solution, 8, II

15. REGULATORY INFORMATION

International Inventories

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No</th>
<th>U.S. TSCA</th>
<th>KOREA KECL</th>
<th>Philippines (PICCS)</th>
<th>Japan ENCS</th>
<th>China IECSC</th>
<th>Australia (AICS)</th>
<th>EINECS-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>Present ACTIV E</td>
<td>Present KE-35400</td>
<td>Present</td>
<td>Not present</td>
<td>Present</td>
<td>Present</td>
<td>Present 231-791-2</td>
</tr>
<tr>
<td>Hydrogen chloride</td>
<td>7647-01-0</td>
<td>Present ACTIV E</td>
<td>Present KE-20189</td>
<td>Present</td>
<td>Present (1)-215</td>
<td>Present</td>
<td>Present</td>
<td>Present 231-595-7</td>
</tr>
</tbody>
</table>

U.S. Regulations

**Hydrogen chloride**
- Massachusetts RTK: Present
- Massachusetts EHS: extraordinarily hazardous
- New Jersey RTK Hazardous Substance List: 1012
- New Jersey (EHS) List: 1012 500 lb TPQ 2909 500 lb TPQ
- New Jersey - Discharge Prevention - List of Hazardous Substances: Present
- New Jersey TCPA - EHS: 15000lbTQ 5000lbTQ 5600lbTQ 2909 500 lb TPQ
- Pennsylvania RTK: Environmental hazard
- Pennsylvania RTK - Environmental Hazard List Present
- Michigan PSM HHC: = 5000 lb TQ
- Minnesota - Hazardous Substance List: Present
- New York Release Reporting - List of Hazardous Substances: 5000 lb RQ 100 lb RQ 15000lbTQ 3000 lb RQ 2000 lb RQ 1000 lb RQ
- Louisiana Reportable Quantity List for Pollutants: 5000lbRQAs listed in 40 CFR 117.3 Table 117.3 and 40 CFR 302.4 Table 302.4 2270kgfinal RQAs listed in 40 CFR 117.3 Table 117.3 and 40 CFR 302.4 Table 302.4 5000lbRQAs listed in Louisiana Administrative Code, Title 33, Part 1, Subpart 2, Chapter 39, Subchapter E. Applies to unauthorized emissions based on total mass emitted into or onto all media within any consecutive 24-hour period 1000lbRQAs listed in Louisiana Administrative Code, Title 33, Part 1, Subpart 2, Chapter 39, Subchapter E. Applies to unauthorized emissions based on total mass emitted into the atmosphere
- California Directors List of Hazardous Substances: Present
- FDA - Food Additives Generally Recognized as Safe (GRAS): 21 CFR 182.1057
- List Sourced from EAFUS


**Chemicals Known to the State of California to Cause Cancer:**
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

**Chemicals Known to the State of California to Cause Reproductive Toxicity:**
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No</th>
<th>Carcinogen</th>
<th>Developmental Toxicity</th>
<th>Male Reproductive Toxicity</th>
<th>Female Reproductive Toxicity</th>
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<tbody>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
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Product code: H1041
Product name: HYDROCHLORIC ACID, 37 PERCENT, ELECTRONIC/CLEANROOM GRADE
### CERCLA/SARA

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No</th>
<th>CERCLA - Hazardous Substances and their Reportable Quantities</th>
<th>Section 302 Extremely Hazardous Substances and TPQs</th>
<th>Section 302 Extremely Hazardous Substances and RQs</th>
<th>Section 313 - Chemical Category</th>
<th>Section 313 - Reporting de minimis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Hydrogen chloride</td>
<td>7647-01-0</td>
<td>5000 lb final RQ 2270 kg final RQ</td>
<td>5000 lb EPCRA RQ</td>
<td>None</td>
<td>None</td>
<td>1.0 % de minimis concentration</td>
</tr>
</tbody>
</table>

### U.S. TSCA

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No</th>
<th>TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)</th>
<th>TSCA 8(d) - Health and Safety Reporting</th>
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</thead>
<tbody>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Hydrogen chloride</td>
<td>7647-01-0</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

### Canada

#### WHIMIS 2015 - GHS Classifications

**WHIMIS 2015 Hazard Classification Information:**

<table>
<thead>
<tr>
<th>Component</th>
<th>WHIMIS 2015 Hazard Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>Not a dangerous product according to HPR classification criteria</td>
</tr>
<tr>
<td>Hydrogen chloride</td>
<td>Hydrogen Chloride: Gases under pressure - Liquefied gas: H280 Contains gas under pressure, may explode when heated.; Corrosive to Metals - Category 1: H290 May be corrosive to metals. (potentially corrosive to metals; the supplier should be contacted for more information); Acute toxicity - Inhalation - Category 3: H331 Toxic if inhaled.; Health Hazard Not Otherwise Classified - Category 1: Causes severe damage to the respiratory tract; Skin corrosion/irritation - Category 1: H314 Causes severe skin burns and eye damage.; Serious Eye Damage/Eye Irritation - Category 1: H318 Causes serious eye damage. Hydrochloric Acid: Corrosive to Metals - Category 1: H290 May be corrosive to metals. (potentially corrosive to metals; the supplier should be contacted for more information); Acute toxicity - Oral - Category 4: H302 Harmful if swallowed. (3.6% in aqueous solution); Acute toxicity - Inhalation - Category 2: H330 Fatal if inhaled.; Health Hazard Not Otherwise Classified - Category 1: Causes severe damage to the respiratory tract; Skin corrosion/irritation - Category 1: H314 Causes severe skin burns and eye damage.; Skin corrosion/irritation - Category 2: H315 Causes skin irritation. (3.6% in aqueous solution); Serious Eye Damage/Eye Irritation - Category 1: H318 Causes serious eye damage.; Serious Eye Damage/Eye Irritation - Category 2: H319 Causes serious eye irritation. (3.6% in aqueous solution)</td>
</tr>
</tbody>
</table>

#### Canada Hazardous Products Regulation

This product has been classified according to the hazard criteria of the HPR (Hazardous Products Regulation) and the SDS contains all of the information required by the HPR

### DSL/NDSL

**Product code:** H1041  
**Product name:** HYDROCHLORIC ACID, 37 PERCENT, ELECTRONIC/CLEANROOM GRADE
<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No</th>
<th>Classification</th>
<th>Concentration Limits:</th>
<th>Safety Phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>CEPA Schedule I - Toxic Substances</td>
<td></td>
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<tr>
<td>Hydrogen chloride</td>
<td>7647-01-0</td>
<td>CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting</td>
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<tr>
<td>Water</td>
<td>7732-18-5</td>
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<td></td>
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<tr>
<td>Hydrogen chloride</td>
<td>7647-01-0</td>
<td>Not listed</td>
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</tr>
</tbody>
</table>

EU Classification

EU GHS - SV - CLP 1272/2008

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No</th>
<th>EU GHS - SV - CLP (1272/2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen chloride</td>
<td>7647-01-0</td>
<td>Hydrogen Chloride: Gases under pressure: H280 Contains gas under pressure, may explode when heated.; Acute toxicity - Inhalation - Acute Tox. 3: H331 Toxic if inhaled. (Minimum classification); Skin corrosion/irritation - Skin Corr. 1A: H314 Causes severe skin burns and eye damage.017-002-00-2 Hydrochloric Acid: Skin corrosion/irritation - Skin Corr. 1B: H314 Causes severe skin burns and eye damage. (C &gt;= 25 %); Specific target organ toxicity - Single exposure - STOT SE 3: H335 May cause respiratory irritation. (C &gt;= 10 %).017-002-01-X Skin corrosion/irritation - Skin Corr. 1B: H314 Causes severe skin burns and eye damage. (C &gt;= 25 %); Skin corrosion/irritation - Skin Irrit. 2: H315 Causes skin irritation. (10 % &lt;= C &lt;25 %); Serious Eye Damage/Eye Irritation - Eye Irrit. 2: H319 Causes serious eye irritation. (10 % &lt;= C &lt;25 %); Specific target organ toxicity - Single exposure - STOT SE 3: H335 May cause respiratory irritation. (C &gt;= 10 %).017-002-01-X</td>
</tr>
</tbody>
</table>

EU - CLP (1272/2008)

R-phrase(s)
R34 - Causes burns
R37 - Irritating to respiratory system

S-phrase(s)
S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)
S 1/2 - Keep locked up and out of the reach of children.

**Product code:** H1041  **Product name:** HYDROCHLORIC ACID, 37 PERCENT, ELECTRONIC/CLEANROOM GRADE

**Page 15 / 16**
Water 7732-18-5 No information

Hydrogen chloride 7647-01-0
Hydrochloric Acid: + hydrochloric acid ...%
C; R34 - Xi; R37
Concentration Limit(s): C >= 25% C; R34-37
10% <= C < 25% Xi; R36/37/38

For Hydrogen Chloride: S1/2 S9 S26 S36/37/39 S45
Hydrochloric Acid: S(1/2)-S26-S45

The product is classified in accordance with Annex VI to Directive 67/548/EEC

Indication of danger:
C - Corrosive
Xi - Irritant

C           Xi

16. OTHER INFORMATION

Preparation Date: 10/16/2013
Revision date 10/17/2019
Prepared by: Sonia Owen

Disclaimer: All chemicals may pose unknown hazards and should be used with caution. This Safety Data Sheet (SDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. The physical properties reported in this SDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user’s responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.

End of Safety Data Sheet

Product code: H1041  Product name: HYDROCHLORIC ACID, 37 PERCENT, ELECTRONIC/CLEANROOM GRADE  Page 16 / 16