

Safety Data Sheet (SDS)

HYDROCHLORIC ACID

Section 1: Product and Company Identification

Product Name:	HYDROCHLORIC ACID	Index Number:	017-002-01-X
Product Number(s):	S010401, S010401-SSEC03, S010401-SSEC04, S010401-SSEC05, S010401-SSEC06, S010401-SSEC09, S010401-SSEC10, S010401-SSEC41, S010401-SSEC61, S010401-SSEC63, S010401-SSEC65, S010401-SSD12, S010401-SSEE03, S010401-SSEE04, S010401-SSEE05, S010401-SSEE06, S010401-SSEE09, S010401-SSEE10, S010401-SSEG03, S010401-SSEG04, S010401-SSEG09, S010401-SSEG10, S010401-SSEG41, S010401-SSEG61, S010401-SSEG65, S010401-SSEH43, S010401-SSNC03, S010401-SSNC04, S010401-SSNC05, S010401-SSNC06, S010401-SSNC09, S010401-SSNC10, S010401-SSNC41, S010401-SSNC61, S010401-SSNC63, S010401-SSNC65, S010401-SSND12, S010401-SSEG03, S010401-SSEG04, S010401-SSEG09, S010401-SSEG10, S010401-SSEG41, S010401-SSEG61, S010401-SSEG65, S010401-SSNQ03, S010401-SSNQ09, S010401-SSNH43, S020401, S020401-SSEF07, S020401-SSEF08, S020401-SSEP01, S020401-SSEP02, S020401-SSEP03, S020401-SSEP04, S020401-SSEP05, S020401-SSEP06, S020401-SSNF07, S020401-SSNF08, S020401-SSNP01, S020401-SSNP02, S020401-SSNP03, S020401-SSNP04, S020401-SSNP05, S020401-SSNP06, S020401-SSRF07, S020401-SSRF08, S020401-SSRP01, S020401-SSRP02, S020401-SSRP03, S020401-SSRP04, S020401-SSRP05, S020401-SSRP06, S050401, S050401-SSEH05, S050401-SSEH06, S050401-SSEH63, S050401-SSNH05, S050401-SSNH06, S050401-SSNH63, S010401-SSD12, S010401-SSND12, S010401-SSD20, S010401-SSND20, S040401-SSD12, S040401-SSND12, S040401-SSD20, S040401-SSND20		
Synonyms:	Chlorohydric acid; Hydrogen chloride; Muriatic acid; Spirits of salt		
Chemical names:	DE Salzsäure; ES Ácido clorhídrico; FR Chlorure d'hydrogène; IT Acido cloridrico; NL Zoutzuur		
Supplier:	SEASTAR CHEMICALS Inc.		
Address:	10005 McDonald Park Road, Sidney, BC V8L 5Y2 CANADA		
Phone Number:	250-655-5880	Fax Number:	250-655-5888
CANUTEC (CAN):	613-996-6666		

Section 2: Hazards Identification

Emergency Overview			
Appearance:	Clear, colourless to slightly yellow liquid.		
Target Organs:	Skin, eyes, respiratory system.		
GHS			
Classification:	Skin corrosion – Category 1B Specific target organ toxicity, Single Exposure – Category 3 Corrosive to metals – Category 1	Pictograms:	  GHS05 GHS07
Signal Word:	Danger		

Hazard Statements:

H314: Causes severe skin burns and eye damage.
H335: May cause respiratory irritation.
H290: May be corrosive to metals.

Precautionary Statements:

P234: Keep only in original container.
P260: Do not breathe fumes/gas/mist/vapours/spray.
P264: Wash thoroughly after handling.
P271: Use only in a well-ventilated area.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310: Immediately call a POISON CENTER or doctor/physician.
P363: Wash contaminated clothing before reuse.
P390: Absorb spillage to prevent material damage.
P403+P233: Store in a well-ventilated place. Keep container tightly closed.
P405: Store locked up.
P406: Store in corrosion resistant container with a resistant inner liner.
P501: Dispose of contents/container according to federal, regional and local government requirements.

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Section 3: Composition/Information on Ingredients

CAS No.	Chemical Name	Percent	EINECS / ELINCS No.
7647-01-0	Hydrogen chloride	20-38%	231-595-7
7732-18-5	Water	Balance	231-791-2

Section 4: First Aid Measures

In case of contact:

Inhalation:	This chemical is very toxic. Take proper precautions to ensure your own safety before attempting rescue (e.g., wear appropriate protective equipment, use the "buddy" system). Remove source of contamination or move victim to fresh air. If breathing is difficult, trained personnel should administer emergency oxygen. DO NOT allow victim to move about unnecessarily. Symptoms of pulmonary edema can be delayed up to 48 hours after exposure. If breathing has stopped, trained personnel should begin artificial respiration (AR) or, if the heart has stopped, cardiopulmonary resuscitation (CPR) or automated external defibrillation (AED) immediately. Avoid mouth-to-mouth contact by using mouth guards or shields. Quickly transport victim to an emergency care facility.
Skin:	Avoid direct contact. Wear chemical protective clothing, if necessary. As quickly as possible, remove contaminated clothing, shoes and leather goods. Immediately flush with lukewarm, gently flowing water for at least 30 minutes. If irritation persists, repeat flushing. DO NOT INTERRUPT FLUSHING. If necessary and it can be done safely, continue flushing during transport to emergency care facility. Quickly transport victim to an emergency care facility. Double bag, seal, label and leave contaminated clothing, shoes and leather goods at the scene for safe disposal. NOTE: Any skin contact will also involve significant inhalation exposure.
Eye:	Avoid direct contact. Wear chemical protective gloves, if necessary. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for at least 30 minutes, while holding the eyelid(s) open. If a contact lens is present, DO NOT delay irrigation or attempt to remove the lens. Neutral saline solution may be used as soon as it is available. DO NOT INTERRUPT FLUSHING. If necessary, continue flushing during transport to emergency care facility. Take care not to rinse contaminated water into the unaffected eye or onto the face. Quickly transport victim to an emergency care facility. NOTE: Any eye contact will also involve significant inhalation exposure.
Ingestion:	NEVER give anything by mouth if victim is rapidly losing consciousness, is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. If vomiting occurs naturally, have victim rinse mouth with water again. Quickly transport victim to an emergency care facility.
Notes to Physician/Doctor:	Provide general supportive measures (comfort, warmth, rest). Consult a doctor and/or the nearest Poison Control Centre for all exposures. All first aid procedures should be periodically reviewed by a doctor familiar with the material and its conditions of use in the workplace.

Section 5: Fire Fighting Measures

Fire Hazard Summary:

Hydrochloric acid is not combustible, but it is extremely corrosive and very toxic. Decomposes under intense fire conditions to form extremely flammable and potentially explosive hydrogen gas and very toxic and corrosive chlorine gas. Contact with common metals produces extremely flammable hydrogen gas. Heat from a fire can cause a rapid build-up of pressure inside closed containers, which may cause explosive rupture and a sudden release of large amounts of flammable and corrosive gases. Firefighters should wear a positive pressure self-contained respirator (SCBA) and full-body encapsulating chemical protective suit.

Extinguishing Media:	Hydrochloric acid does not burn. Use extinguishing agents compatible with hydrochloric acid and appropriate for the surrounding fire.
Extinguishing Media to be Avoided:	Hydrochloric acid will react with most foams and release corrosive/toxic gases.
Flash Point:	Not combustible (does not burn).
Lower Flammable (Explosive) Limit (LFL/LEL):	Not applicable
Upper Flammable (Explosive) Limit (UFL/UEL):	Not applicable

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Autoignition Temperature:	Not available.
Sensitivity to Mechanical Impact:	Probably not sensitive. Stable material.
Sensitivity to Static Charge:	Will not accumulate static charge or be ignited by a static discharge.
Electrical Conductivity: (@ 25 °C)	8.35×10^{15} pS/m (28.63%)
Minimum Ignition Energy:	Not applicable
Combustion and Thermal Decomposition Products:	Chlorine gas, hydrogen chloride, hydrogen gas.
NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) HAZARD IDENTIFICATION – Hydrogen chloride, anhydrous	
Health:	3 – Short exposure could cause serious temporary or residual injury.
Flammability:	0 – Will not burn under typical fire conditions.
Reactivity:	1 – Normally stable, but can become unstable at elevated temperatures and pressures, or may react vigorously, but non-violently with water.

Section 6: Accidental Release Measures

Spill Precautions:

Evacuate all downwind, unprotected personnel. Restrict access to area until completion of clean-up. Ensure clean-up is conducted by trained personnel only. Wear adequate personal protective equipment. Ventilate area. Notify government occupational health and safety and environmental authorities.

Clean-up:

Do not touch spilled material. Keep upwind and out of low areas. Prevent material from entering sewers, waterways or confined spaces. Stop or reduce leak if it can be done without risk. Water fog or spray may be necessary to knock down vapours. Recover spilled hydrochloric acid if feasible. Contain spill with earth, sand, or absorbent material which does not react with spilled material.

SMALL SPILLS: Contain and soak up spill with absorbent material that does not react with spilled chemical. Put material in suitable, covered, labelled containers. Flush area with water. Do not get water inside containers. Contaminated absorbent material may pose the same hazards as the spilled product.

LARGE SPILLS: Evacuate and ventilate the area. Contact fire and emergency services and supplier for advice.

Section 7: Handling and Storage

Handling:

This material is VERY TOXIC (INHALATION HAZARD, may be fatal). It is also a SKIN CONTACT HAZARD and CORROSIVE to the eyes and skin. Before handling, it is very important that engineering controls are operating and that protective equipment requirements and personal hygiene measures are being followed. People working with this chemical should be properly trained regarding its hazards and its safe use.

Avoid generating hydrogen chloride vapours or mists. Prevent the release of vapours/mist into workplace air. Consider using closed handling systems for processes involving this material. If a closed handling system is not possible, use in the smallest possible amounts in a well-ventilated area, separate from the storage area. In case of leaks or spills, escape-type respiratory protective equipment should be available in the work area. If hydrochloric acid is released, immediately put on a suitable respirator and leave the area until the severity of the release is determined. Immediately report leaks, spills or ventilation failures.

Be aware of typical signs and symptoms of poisoning and first aid procedures. Any signs of illness should be reported immediately to supervisory personnel. Seek medical attention for all exposures even if an exposure did not seem excessive. Symptoms of a severe exposure can be delayed.

Do not use with incompatible materials such as oxidizing agents, reducing agents, metals, bases, sulfuric acid, perchloric acid and many more. See Section 10 for more information. Do not use near welding operations, flames or hot surfaces. Do not perform any welding, cutting, soldering, drilling or other hot work on an empty vessel, container or piping until all liquid and vapours have been cleared.

Inspect containers for leaks before handling. Prevent damage to containers. Label containers. Open containers carefully on a stable surface. Keep containers tightly closed when not in use. Assume that empty containers contain residues which are hazardous. To avoid splashing, carefully dispense into sturdy containers made of compatible materials. Secondary

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protective containers must be used when this material is being carried. Use corrosion resistant transfer equipment when dispensing. Whenever possible, use self-closing, portable containers for dispensing small amounts of this material. Never transfer liquid by pressurizing original container with air or inert gas.

Never add water to a corrosive. Always add corrosives to water. When mixing with water, stir small amounts in slowly. Use cold water to prevent excessive heat generation. Maintain handling equipment. Comply with applicable regulations. Have suitable emergency equipment for fires, spills and leaks readily available.

Storage:

Store in a cool, dry, well-ventilated area, out of direct sunlight and away from heat sources. Keep quantity stored as small as possible. Drums should be vented when received and then at least weekly to relieve internal pressure. Store away from incompatible materials, such as oxidizing agents, reducing agents, bases and metals. See Section 10 for more information.

Use corrosion-resistant structural materials and lighting and ventilation systems in the storage area. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Keep storage area separate from work areas, eating areas and protective equipment storage. Post warning signs. Inspect periodically for damage or leaks. Consider leak detection system with an alarm. Provide raised sills or ramps at doorways or create a trench which drains to a safe location. Floors should not allow liquids to penetrate. Storage tanks should be above ground, over an area sealed on the bottom and diked to hold entire contents.

Inspect all incoming containers to make sure they are properly labelled and not damaged. Store containers at a convenient height for handling, below eye level if possible. Avoid stacking. Keep containers tightly closed when not in use and when empty. Protect from damage. Keep empty containers in separate storage area. Empty containers may contain hazardous residues. Keep closed. Contain spills or leaks by storing in trays made from compatible materials. Keep absorbents for leaks and spills readily available.

Section 8: Exposure Controls/Personal Protection

General Exposure Precautions:

NOTE: Exposure to this material can be controlled in many ways. The measures appropriate for a particular worksite depend on how this material is used and on the extent of exposure. This general information can be used to help develop specific control measures. Ensure that control systems are properly designed and maintained. Comply with occupational, environmental, fire, and other applicable regulations.

Engineering Controls:

Engineering methods to control hazardous conditions are preferred. Methods include mechanical ventilation (dilution and local exhaust), process or personnel enclosure, control of process conditions, and process modification (e.g., substitution of a less hazardous material). Administrative controls and personal protective equipment may also be required. Because of the high potential hazard associated with this substance, stringent control measures such as enclosure or isolation are recommended when dealing with large quantities.

Use corrosion-resistant ventilation systems separate from other exhaust ventilation systems. Consider down-draft general exhaust ventilation in potential high concentration areas such as unloading stations, cylinder, drum or carboy filling stations, treatment vats, and waste disposal areas. Exhaust directly to the outside. Local exhaust ventilation is usually required. Supply sufficient replacement air to make up for air removed by exhaust system. Cleaning of contaminated exhaust air before release to the outdoors is usually necessary.

Personal Protective Equipment:

If engineering controls and work practices are not effective in controlling exposure to this material, then wear suitable personal protective equipment including approved respiratory protection. Have appropriate equipment available for use in emergencies such as spills or fire.

If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection. Refer to the CSA Standard Z94.4-11, "Selection, Use and Care of Respirators," available from the Canadian Standards Association.

Eye / Face protection:

Wear gas-tight chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. A face shield may also be necessary.

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Skin protection:	Wear impervious gloves and appropriate protective clothing. Choose body protection according to the amount and concentration of the substance at the work place. A chemical protective acid-resistant full-body encapsulating suit and respiratory protection may be required in some operations. Have a safety shower/eye-wash fountain readily available in the immediate work area.
Resistance of Materials for Protective Clothing:	Guidelines for hydrochloric acid, 37%: RECOMMENDED (resistance to breakthrough longer than 8 hours): Butyl or neoprene rubber; Viton®; Viton®/Butyl rubber; Barrier (PE/PA/PE); Trelchem® HPS or VPS; Tychem® SL (Saranex®), CPF 3, F, BR/LV, Responder®, or TK. CAUTION, use for short periods only (resistance to breakthrough within 1 to 4 hours): Polyethylene. NOT RECOMMENDED for use (resistance to breakthrough less than 1 hour): Polyvinyl alcohol.
Inhalation / Ventilation:	Use in a chemical fume hood. Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator with cartridge(s) to protect against hydrogen chloride (US) or type B[E]-P2 (EN 141) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
Personal Hygiene:	Remove contaminated clothing immediately and keep in closed containers. Discard or launder before re-wearing. Inform laundry personnel of contaminant's hazards. Do not eat or drink in work areas. Maintain good housekeeping. Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

EXPOSURE GUIDELINES – Listed under Hydrogen chloride, as HCl

NIOSH:	REL-C: 5 ppm (7 mg/m ³)
ACGIH:	TLV-C: 2 ppm
OSHA Final PEL:	PEL-C: 5 ppm (7 mg/m ³)

Section 9: Physical and Chemical Properties			
Form:	Liquid	Melting/Freezing Point:	20.69% w/w: -62.25 °C (-80.1 °F)
Color:	Clear, colourless		31.24% w/w: -46.2 °C (-51.2 °F)
Odour:	Strong – pungent odour		35.2% w/w: -35 °C (-31 °F)
Odour Threshold:	1-5 ppm (detection)	Boiling Point:	20.22% w/w: 108.58 °C (227.4 °F)
Chemical Formula:	HCl	pH: (@ 25 °C)	1.1 (0.1 M); 0.1 (1 M)
Formula Weight:	36.46 g/mol	Solubility:	Very soluble in water
Vapour Density:	1.3 (approx. 36%) (air = 1)	Density: (@ 20 °C)	20.22% w/w: 1.0959 g/cm ³ (@ 25°C)
Vapour Pressure: (Partial, @ 20 °C)	0.027 kPa (0.205 mmHg) (20%)		20% w/w: 1.0980 g/cm ³
	1.41 kPa (10.6 mmHg) (30%)		30% w/w: 1.1492 g/cm ³
	14.1 kPa (105.5 mmHg) (36%)		36% w/w: 1.1791 g/cm ³
	28.0 kPa (210 mmHg) (38%)		38% w/w: 1.1886 g/cm ³

Section 10: Stability and Reactivity

Normally stable. Large amounts of heat can be released when concentrated hydrochloric acid is mixed with water or organic solvents.

Incompatibility – Materials to Avoid:

NOTE: Chemical reactions that could result in a hazardous situation (e.g. generation of flammable or toxic chemicals, fire or detonation) are listed here. Many of these reactions can be done safely if specific control measures (e.g. cooling of the reaction) are in place. Although not intended to be complete, an overview of important reactions involving common chemicals is provided to assist in the development of safe work practices.

METALS (e.g. steel, copper, brass or zinc) - extremely flammable hydrogen gas is released on reaction with many common metals.

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SODIUM - explodes on contact.

BASES (e.g. sodium hydroxide, potassium hydroxide, ammonium hydroxide, amines, 2-aminoethanol or thyleneimine) - react violently generating heat and pressure.

FORMALDEHYDE - can react to form the potent human carcinogen, bis(chloromethyl) ether.

OXIDIZING AGENTS (e.g. hydrogen peroxide, chlorates or chlorites) - may react generating heat and very toxic and corrosive chlorine gas.

REDUCING AGENTS (e.g. metal hydrides) - reaction may produce extremely flammable hydrogen gas, heat and fire.

PERCHLORIC ACID - decomposes spontaneously and violently.

SULFURIC ACID - dehydrates concentrated hydrochloric acid to release some 250 volumes of hydrogen chloride gas. In a closed tank, sufficient gas may be formed to cause the tank to burst violently.

POTASSIUM PERMANGANATE - a sharp explosion may be produced on adding concentrated hydrochloric acid to potassium permanganate.

ALDEHYDES or EPOXIDES - hydrochloric acid may catalyze violent polymerization, generating heat and pressure.

FLUORINE - incandesces on contact. Aqueous solutions produce flame.

ACETYLIDES (e.g. cesium acetylide or rubidium acetylide), BORIDES (e.g. magnesium boride), CARBIDES (e.g. rubidium carbide), PHOSPHIDE (e.g. uranium phosphide) or SILICIDES (e.g. lithium silicide) - react producing spontaneously flammable gases (e.g. acetylene, borane, phosphine or silane, respectively).

HEXALITHIUM DISILICIDE - incandesces in concentrated acid; flammable silanes (silicon hydrides) are evolved on contact with dilute acid.

OTHER - Mixing 36% hydrochloric acid with acetic anhydride or chlorosulfonic acid or oleum or propiolactone or propylene oxide or vinyl acetate in a closed container caused the temperature and pressure to increase.

Conditions to avoid:	High temperatures, light, incompatible materials.
Hazardous Decomposition Products:	Chlorine gas, hydrogen chloride, hydrogen gas.
Hazardous Polymerization:	Does not polymerize, but reaction with aldehydes or epoxides can cause polymerization.

Corrosivity to Metals:

Hydrochloric acid (20-38%) is corrosive to most metals, including stainless steels (e.g. 300 series, 400 series, 17-4 PH and Carpenter 20 Cb-3), aluminum (e.g. types 3003, 5052 and Cast B-356), carbon steel (e.g. types 1010, 1020, 1075 and 1076), unalloyed cast iron, zinc, the nickel-base alloys, Monel, Hastelloy D and Incoloy 800, copper, copper-nickel alloy, bronze, silicon bronze, aluminum bronze, brass, naval brass, admiralty brass and titanium. Hydrochloric acid (20-38%) is not corrosive to the nickel-base alloys, Hastelloy B/B-2, Hastelloy C/C-276, Hastelloy G, Monel 625 and Monel 825 and high-silicon cast irons. High-nickel austenitic cast irons offer some resistance to all hydrochloric acid concentrations at room temperature.

Dilute hydrochloric acid (up to 10%) is corrosive to stainless steels (e.g. 300 series, 400 series and 17-4 PH), aluminum (e.g. types 3003, 5052 and Cast B-356), carbon steel (e.g. types 1010, 1020, 1075 and 1076), unalloyed cast iron, zinc, Monel, copper, copper-nickel, bronze, silicon bronze, brass, naval brass and admiralty brass. Dilute hydrochloric acid (up to 10%) is not corrosive to the nickel-base alloys, Hastelloy B/B-2, Hastelloy C/C-276, Hastelloy D and Incoloy 825, nickel, high-silicon irons, high-nickel cast irons, the stainless steel, Carpenter 20 Cb-3 (containing 32-38% nickel), titanium and zirconium.

Corrosivity to Non-Metals:

Hydrochloric acid (up to 38%) attacks plastics, such as nylon and polyacetal homopolymer (Delrin); and elastomers, such as, chlorinated polyethylene (CM), styrene-butadiene (SBR) and polysulfone. Hydrochloric acid (up to 38%) does not attack plastics, such as Teflon, and other fluorocarbons, like ethylene tetrafluoroethylene (Tefzel), ethylene chlorotrifluoroethylene (Halar) and polyvinylidene fluoride (Kynar), polyvinylidene chloride (Saran), chlorinated polyvinyl chloride (CPVC), polyvinyl chloride (PVC), polypropylene, acrylonitrile-butadiene-styrene (ABS), styrene-acrylonitrile (SAN), polybutylene terephthalate, high-density polyethylene (LDPE), ultra high molecular weight polyethylene (UHMWPE), crosslinked polyethylene (XLPE), thermoset polyesters (bisphenol A fumarate and isophthalic acid), polystyrene, and ethylene vinyl acetate (EVA); and elastomers, such as ethylene-propylene, Viton A and other fluorocarbons, like Chemraz, Kalrez and Teflon, isoprene, natural rubber, Nitrile Buna N (up to 35% hydrochloric acid), chlorosulfonated polyethylene (Hypalon), flexible polyvinyl chloride, ethylene vinyl acetate (EVA) and low-density polyethylene (LDPE).

Section 11: Toxicological Information

Potential Health Effects

Inhalation:	May be fatal if inhaled. Hydrochloric acid solutions can readily release high concentrations of hydrogen chloride gas, which is very toxic and corrosive and poses a serious inhalation hazard. Inhalation of even low concentrations is irritating and can cause coughing, pain, inflammation and swelling in the upper respiratory tract. Higher concentrations can cause constriction of the larynx and bronchi, closure of the glottis, and severe exposure can result in a potentially fatal accumulation of fluid in the lungs (pulmonary edema). Symptoms of pulmonary edema (chest pain and shortness of breath) can be delayed for up to 24 or 48 hours after exposure.
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Skin:	Hydrochloric acid is corrosive and can cause severe burns, blisters, ulcers and permanent scarring, depending on the concentration of the solution and the duration of contact. Any skin contact is likely to involve significant inhalation exposure. May be absorbed through the skin in harmful amounts.
Eye:	Hydrochloric acid is corrosive and can cause severe eye burns and permanent injury, including blindness, depending on the concentration of the solutions and duration of contact. Any eye contact may also involve significant inhalation exposure.
Ingestion:	May be fatal if swallowed. Hydrochloric acid solutions are corrosive and can cause burns to the lips, tongue, throat and stomach; abdominal pain; nausea; vomiting; diarrhea and death. Immediate effects include burning of the mouth throat and stomach followed by vomiting with loss of blood. Difficulty swallowing and ulceration and narrowing of the esophagus are often seen following ingestion.
Chronic:	A single, high-level exposure may cause long-term airways hypersensitivity (RADS). Prolonged or repeated inhalation may cause nosebleeds, nasal congestion, erosion of the teeth, perforation of the nasal septum, chest pains, and bronchitis. Repeated exposure may cause conjunctivitis or dermatitis. To the best of our knowledge the chronic toxicity of this substance has not been fully investigated.

Effects of Long-Term (Chronic) Exposure

RTECS#:	CAS# 7647-01-0: MW4025000
Descriptor:	Tumorigen; Mutagen; Reproductive Effector; Human; Primary Irritant
LD50/LC50:	Inhalation, rat: LC50 = 3124 ppm/1H Inhalation, mouse: LC50 = 1108 ppm/1H Oral, rabbit: LD50 = 900 mg/kg
Epidemiology:	Skin, human: Standard Draize test, 4%/24H - mild reaction Eye, rabbit: Rinsed with water, 5 mg/30S - mild reaction
Teratogenicity:	No human information available.
Reproductive Effects:	Inhalation, rat: TCLo = 450 mg/m ³ /1H (female 1D pre-mating) – Effects: fetotoxicity, homeostasis abnormalities
Neurotoxicity:	No information found.
Mutagenicity:	Lung, hamster: Cytogenetic analysis, 30 mmol/L Ovary, hamster: Cytogenetic analysis, 8 mmol/L Oral, insect: Sex chromosome loss & nondisjunction, 100 ppm
Carcinogenicity:	Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.

Section 12: Ecological Information

Ecotoxicity: Shrimp: LC50 = 100-330 ppm/48H; Shore crab: LC50 = 240 mg/L/48H; Chronic plant toxicity = 100 ppm.
Environmental: Substance will neutralize soil carbonate-based components.

Section 13: Disposal Considerations

Review local/regional/international regulations or requirements prior to disposal. Store material for disposal as indicated in Storage Conditions.

Contaminated packaging: Dispose of as unused product.

Section 14: Transport Information

US DEPARTMENT OF TRANSPORT (DOT) HAZARDOUS MATERIALS SHIPPING INFORMATION (49 CFR)

Shipping Name and Description: HYDROCHLORIC ACID

Identification Number: UN1789

Hazard Class or Division: 8

Packing Group: II

CANADIAN TRANSPORTATION OF DANGEROUS GOODS (TDG) SHIPPING INFORMATION

Shipping Name and Description: HYDROCHLORIC ACID

UN Number: UN1789

Class: 8

Packing Group/Category: II

Special Provisions: ---

Marine Pollutant: ---

Passenger Carrying Road/Railway Vehicle Index: 1 kg or L

SDS: HYDROCHLORIC ACID

International Maritime Dangerous Goods (IMDG)

Proper Shipping Name / Description: HYDROCHLORIC ACID

UN Number: 1789

Class or Division (Sub Risk): 8

Packing Group/Category: II

Special Provisions: ---

Marine Pollutant: ---

EMS Number: F-A, S-B

International Air Transport Association (IATA)

Proper Shipping Name / Description: Hydrochloric acid

UN/ID Number: 1789

Class or Division (Sub Risk): 8

Packing Group: II

Special Provisions: A803

Passenger / Cargo Aircraft: 851 Pkg Inst, 1 L Max Net

Cargo Aircraft Only: 855 Pkg Inst, 30 L Max Net

Section 15: Regulatory Information

Hydrochloric acid

CAS# 7647-01-0

US Federal:

TSCA

Listed on the TSCA Inventory.

SARA Title III: Section 302

Not subject to the reporting requirements.

SARA Title III: Section 313

Does not exceed the threshold (De Minimis) reporting level of 5,000 lbs.

US State:

Massachusetts Right To Know

Subject to this act, 100 lbs RQ.

Pennsylvania Right To Know

Subject to this act.

New Jersey Right To Know

Subject to this act, RTK# 1012.

California Prop. 65

Not subject to this act.

Canada

DSL/NDL Status:

Is listed, record number: 8308

WHMIS Classifications:

D1A – Very toxic

E – Corrosive material

Section 16: Other Information

Revision Date:

07-2014, Supersedes 04-2011

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