SAFETY DATA SHEET

HYDROCHLORIC ACID (HCl) (ALL GRADES)

North America EN
SDS No.: M34514

Rev. Date: 10-Jun-2026
Rev. Num. 10

SECTION 1. CHEMICAL PRODUCT / COMPANY IDENTIFICATION

Company Identification:	Occidental Chemical Corporation 14555 Dallas Parkway, Suite 400 Dallas, Texas 75254-4300
24-Hour Emergency Telephone Number:	1-800-733-3665 (USA); CANUTEC (Canada): 1-613-996-6666; CHEMTREC (within USA and Canada): 1-800-424-9300; CHEMTREC (outside USA and Canada): +1 703-527-3887; CHEMTREC Contract No: CCN16186
To Request an SDS:	MSDS@oxy.com or 1-972-404-3245
Customer Service:	1-800-752-5151 or 1-972-404-3700
Product Identifier:	**HYDROCHLORIC ACID (HCl) (ALL GRADES)**
Trade Name:	Hydrochloric Acid (HCl) aqueous all grades Hydrochloric Acid Technical, 22 Degree Baume Hydrochloric Acid Technical, 20 Degree Baume
Synonyms:	Muriatic Acid; HCl Solution; Aqueous hydrogen chloride
Product Use:	Hydrochloric acid is a versatile chemical used in various industries. Its main applications include steel pickling, oil well acidizing, food processing (such as making corn syrup and hydrolyzed vegetable protein), and producing calcium chloride for highway deicing and industrial uses. In mining, it assists with ore treatment and extraction of metals like molybdenum, gold, tungsten, uranium, and rare earth elements. Other uses span metal cleaning, aluminum etching, catalyst regeneration, pH control, wastewater treatment, brine acidification, and organic chemical production. The pharmaceutical, textile, leather, and dye industries also use hydrochloric acid for synthesis, purification, and other processes
Restrictions on Use (United States):.	The Technical Grade Hydrochloric Acid complies with the testing requirements established by the Food Chemicals Codex and ASTM Standard E 1146. Material manufactured and distributed from OxyChem's Wichita facility holds Star-K Kosher certification and is certified by NSF according to ANSI/NSF Standard 60 for

	Drinking Water Treatment Chemicals. However, the production of Technical Grade Hydrochloric Acid does not encompass all procedures outlined in the Food and Drug Administration's current Good Manufacturing Practices (cGMP).
Other Global Restrictions on Use:	Users are responsible for evaluating the suitability of Technical Grade Hydrochloric Acid in food, feed, or pharmaceutical applications and for ensuring that all relevant regulatory requirements are satisfied.
Chemical Family:	Inorganic Acid

SECTION 2. HAZARDS IDENTIFICATION

OSHA REGULATORY STATUS: Health hazard classifications were performed using OSHA Hazard Communication 2024 (1910.1200) Appendix A and/or UN GHS Rev. 8 (2019). This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

HEALTH CANADA HPR REGULATORY STATUS: This material is considered hazardous by the Health Canada Hazardous Products Act's Hazardous Products Regulations (HPR) (SOR/2015-17).

HAZARD CLASSIFICATION:

GHS: PHYSICAL HAZARDS:	Category 1 - May be corrosive to metals
GHS: CONTACT HAZARD - SKIN:	Category 1A - Causes severe skin burns and eye damage
GHS: CONTACT HAZARD - EYE:	Category 1 - Causes serious eye damage
GHS: ACUTE TOXICITY - INHALATION:	Category 4 - Harmful if inhaled
GHS: ACUTE TOXICITY - ORAL:	Category 4 - Harmful if swallowed
SPECIFIC TARGET ORGAN TOXICITY (STOT) - SINGLE EXPOSURE (SE):	Category 3 - May cause respiratory irritation
HAZARDS NOT OTHERWISE CLASSIFIED (HNOC):	Aquatic Acute: Category 3 (Harmful to aquatic life)

UNKNOWN ACUTE TOXICITY:

Unknown Acute Oral Toxicity:
100% of this product consists of ingredient(s) of known acute oral toxicity.

Unknown Acute Dermal Toxicity:
100% of this product consists of ingredient(s) of known acute dermal toxicity.

Unknown Acute Inhalation Toxicity:
100% of this product consists of ingredient(s) of known acute inhalation toxicity.

GHS SYMBOL: Corrosive, Exclamation mark





GHS SIGNAL WORD: **DANGER**

GHS HAZARD STATEMENTS:

GHS - Physical Hazard Statement(s)
• May be corrosive to metals

GHS - Health Hazard Statement(s)
• Harmful if swallowed
• Causes severe skin burns and eye damage
• Harmful if inhaled
• May cause respiratory irritation

Additional Hazards - GHS Hazards Not Otherwise Classified (HNOC):
• ACUTE AQUATIC HAZARD - CATEGORY 3: Harmful to aquatic life

GHS - Precautionary Statement(s) - Prevention
• Keep only in original container or container compatible with product (see Section 7 - Safe Storage Conditions)
• Do not breathe mist, vapors, or spray
• Wash hands and exposed skin thoroughly after handling. Do not touch eyes
• Do not eat, drink, or smoke when using this product
• Use only outdoors or in a well-ventilated area
• Avoid release to the environment
• Wear protective gloves/protective clothing/eye protection/face protection

GHS - Precautionary Statement(s) - Response
• IF SWALLOWED: Get medical help
• IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
• IF ON SKIN: Get emergency medical help immediately
• IF ON SKIN: Take off immediately all contaminated clothing. Immediately rinse with water for several minutes
• IF INHALED: Get medical help
• IF INHALED: Remove person to fresh air and keep comfortable for breathing
• Wash contaminated clothing before reuse
• Specific treatment (see "Notes to Physician" in Section 4 of the SDS)
• IF IN EYES: Get medical help
• IF IN EYES: Immediately rinse with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
• Absorb spillage to prevent material damage

GHS - Precautionary Statement(s) - Storage
• Store in a well-ventilated place. Keep container tightly closed
• Store locked up
• Store in a corrosive resistant container with a resistant inner liner

GHS - Precautionary Statement(s) - Disposal
• Dispose of contents and container in accordance with applicable local, regional, national, and/or international regulations

Physical Hazards Not Otherwise Classified (HNOC) or Mentioned in GHS/CLP Classification:
• Contact with metals may evolve flammable hydrogen gas
• May spatter or generate heat when mixed with water

Health Hazards Not Otherwise Classified (HNOC) or Mentioned in GHS/CLP Classification
• Exposure to hydrogen chloride gas or vapors can lead to Reactive Airway Dysfunction Syndrome (RADS), a chemically or irritant induced type of asthma

See Section 11: TOXICOLOGICAL INFORMATION

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Systematic Chemical Name	Common name	CAS Number	Percent [%]
Water 7732-18-5	Dihydrogen monoxide (H_2O)	Water	7732-18-5	64 - 69
Hydrochloric Acid 7647-01-0	Hydrogen Chloride	Hydrochloric Acid	7647-01-0	31 - 36

SECTION 4. FIRST AID MEASURES

EYE CONTACT: IF IN EYES: Immediately rinse with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF IN EYES: Get medical help.

SKIN CONTACT: IF ON SKIN: Take off immediately all contaminated clothing. Immediately rinse with water for several minutes. Wash contaminated clothing before reuse. IF ON SKIN: Get emergency medical help immediately. Specific treatment (see "Notes to Physician" in Section 4 of the SDS below).

INHALATION: IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF INHALED: Get medical help.

INGESTION: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF SWALLOWED: Get medical help. The mouth should be rinsed thoroughly with water immediately. Oral fluid administration is not advised, as it may induce vomiting, increasing the risk of aspiration and further exposure of the esophagus to this corrosive agent.

MOST IMPORTANT SYMPTOMS/EFFECTS (ACUTE AND CHRONIC [DELAYED]):
Hydrochloric acid is corrosive to the eyes, skin, and mucus membranes. It may be corrosive to any tissue it comes in contact with. Depending on the concentration, duration, and nature of the exposure, it can cause serious burns and extensive tissue destruction. Ingestion of corrosive acids typically causes vomiting, severe throat and abdominal pain, and may progress to respiratory distress or failure in serious cases. Skin exposure ranges from mild irritation to severe necrosis and permanent scarring, while eye contact rapidly produces burning pain, tearing, and in severe instances, corneal damage. Inhalation of fumes can lead to upper airway irritation and, with prolonged or heavy exposure, result in chest pain, shortness of breath, and potentially acute respiratory distress syndrome (ARDS).

Acute Symptoms/Effects:

Eye: Acute exposure to hydrochloric acid solutions (>5%) and gaseous hydrochloric acid can cause severe irritation with corneal injury which may result in permanent impairment of vision.

Skin: Exposure to hydrochloric acid can produce burns on the skin and mucous membranes, the severity of which is related to the concentration of the solution. Subsequently, ulceration may occur, followed by keloid and retractile scarring. Hydrochloric acid is corrosive to tissue, causing redness, irritation (possibly severe), burns, ulceration, scarring, and possible necrosis (tissue death). Sudden circulatory collapse can occur with shock if large areas of skin have been burned. Severe burns have been fatal.

Inhalation (Breathing): Hydrogen chloride gas and vapors are intensely irritating to the mucous membranes of the nose, throat, and respiratory tract. Brief exposure to 35 ppm causes throat irritation, and levels of 50 to 100 ppm are barely tolerable for 1 hour. The greatest impact is on the upper respiratory tract; exposure to high concentrations can rapidly lead to swelling and spasm of the throat and suffocation. Most seriously exposed persons have immediate onset of rapid breathing, blue coloring of the skin, and narrowing of the bronchioles. Patients who have massive exposures may develop an accumulation of fluid in the lungs. Exposure to hydrogen chloride can lead to Reactive Airway Dysfunction Syndrome (RADS), a chemically or irritant induced type of asthma. Children may be more vulnerable to corrosive agents than adults because of the relatively smaller diameter of their airways. Children may also be more vulnerable from exposure because of increased minute ventilation per kg and failure to evacuate an area promptly when exposed.

Ingestion (Swallowing): Harmful if swallowed. Acute ingestion of concentrated hydrochloric acid may cause nausea, vomiting, abdominal pain, diarrhea, gastrointestinal bleeding, perforation, necrosis, and scarring, acidosis, and sudden circulatory collapse.

Chronic (Delayed) Symptoms/Effects:
Respiratory System Effects: Chronic occupational exposure to hydrochloric acid has been reported to cause chronic bronchitis. Chronic symptoms following corrosive ingestion often include persistent dysphagia due to esophageal stricture formation, which may lead to significant nutritional compromise and chronic anemia. Patients may also experience ongoing pain in the upper gastrointestinal tract, recurrent episodes of vomiting, especially with gastric outlet obstruction—and complications such as fistulae, hiatal hernia, and reflux. In the long term, there is an increased risk of developing esophageal cancer, sometimes decades after the initial injury.

PROTECTION OF FIRST-AID RESPONDERS: Hydrogen chloride gas and vapors are heavier than air and may cause asphyxiation in enclosed, poorly ventilated, or low-lying areas. Protect yourself by avoiding contact with this material. Avoid contact with skin and eyes. Do not breathe dust, fumes, gas, mist, vapors, or spray. Do not ingest. Use personal protective equipment (PPE). Refer to Section 8 for specific PPE recommendations.

NOTES TO PHYSICIAN: Treat as a corrosive substance. Do not attempt to neutralize pH with sodium bicarbonate. Severe burns from heat of reaction with neutralization chemicals have been fatal. Treat via dilution. Water or milk may be used. There is no antidote. Severe burns have been fatal. Treatment is supportive care. Follow normal parameters for airway, breathing, and circulation.

Interaction with Other Chemicals Which Enhance Toxicity: No interaction with other chemicals which enhance toxicity are known.

Medical Conditions Aggravated by Exposure: May aggravate preexisting conditions such as eye disorders that decrease tear production or have reduced integrity of the eye; skin disorders that compromise the integrity of the skin; and respiratory conditions including asthma and other breathing disorders.

SECTION 5. FIRE FIGHTING MEASURES

Explosive properties: Hydrochloric acid and hydrogen chloride gas react violently with many metals, with the generation of highly flammable hydrogen gas, which may explode.

Extinguishing Media: Use media appropriate for surrounding fire.

Unsuitable Extinguishing Media: Do not use a direct water stream. Although aqueous hydrochloric acid solutions are water-based, forceful water application can cause splattering and increase release of corrosive vapors.

Specific Hazards: Not combustible, but if involved in a fire decomposes to produce irritants and toxic gases.

Unusual Hazards: May spatter or generate heat when mixed with water.

Fire Fighting: Keep unnecessary people away, isolate hazard areas and deny entry. Wear NIOSH approved positive-pressure self-contained breathing apparatus operated in pressure demand mode. Move container from the fire area if it can be done without risk. Cool non-leaking containers with water. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

Advice for Firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Avoid contact with skin and eyes. Move container from the fire area if it can be done without risk. Do not apply water directly to a leak. Heat is generated when mixed with water.

Component	U.S. EPA - Acute Exposure Guidelines (AEGL-1) - Final	U.S. EPA - Acute Exposure Guidelines (AEGL-2) - Final	U.S. EPA - Acute Exposure Guidelines (AEGL-3) - Final	Immediately Dangerous to Life/ Health (IDLH)
Hydrochloric Acid 7647-01-0	1.8 ppm 10 min AEGL-1 (final) 1.8 ppm 30 min AEGL-1 (final) 1.8 ppm 60 min AEGL-1 (final) 1.8 ppm 4 h AEGL-1 (final) 1.8 ppm 8 h AEGL-1 (final)	100 ppm 10 min AEGL-2 (final) 43 ppm 30 min AEGL-2 (final) 22 ppm 60 min AEGL-2 (final) 11 ppm 4 h AEGL-2 (final) 11 ppm 8 h AEGL-2 (final)	620 ppm 10 min AEGL-3 (final) 210 ppm 30 min AEGL-3 (final) 100 ppm 60 min AEGL-3 (final) 26 ppm 4 h AEGL-3 (final) 26 ppm 8 h AEGL-3 (final)	45 ppm IDLH 67 mg/m³ IDLH

- Above are IDLHs (immediately dangerous to life or health concentrations) for those substances designated by United States (US) National Institute of Occupational Safety and Health (NIOSH). The IDLH is considered a maximum concentration above which only a highly reliable breathing apparatus providing maximum worker protection should be permitted

Hazardous Combustion Products: Hydrogen chloride; Chlorine; Hydrogen gas

Sensitivity to Mechanical Impact: Not sensitive.

Sensitivity to Static Discharge: Not sensitive.

Lower Flammability Level (air): Not combustible.

Upper Flammability Level (air): Not combustible.

Flash point: Not applicable / Not flammable.

Auto-ignition Temperature: Not flammable.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Remove all ignition sources. Keep unnecessary and unprotected people away. Isolate hazard areas and deny entry. Stop spill/leak if no risk involved. Consider evacuation of personnel located downwind if material is leaking. Do not get in eyes, on skin or on clothing. Do not breathe dust, fumes, gas, mist, vapors, or spray. Do not ingest. Wear appropriate personal protective equipment recommended in Section 8, Exposure Controls / Personal Protection, of the SDS.

Personal Protective Equipment: Wear protective gloves, protective clothing, eye, and face protection. For Unknown Concentrations or exposures above IDLH (Immediately Dangerous to Life or Health) - Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full facepiece. See Section 8 for information on personal protective equipment.

Emergency Procedures: Stop the release if it can be done safely from a distance. Restrict access to the area until cleanup is complete. Prevent material and runoff from entering sewers and waterways if it can be done safely well ahead of the release. Cleanup personnel must wear proper protective equipment. Notify all downstream water users of possible contamination. For other than minor leaks, immediately implement the facility's predetermined emergency response plan.

Environmental Precautions: Keep out of water supplies and sewers. This material is acidic and may lower the pH of the surface waters with low buffering capacity. Releases should be reported, if required, to appropriate agencies.

Methods and Materials for Containment, Confinement, and/or Abatement: Take any precaution to avoid mixing with combustibles or incompatible materials. Shut off ventilation system if needed to prevent fumes from dispersing through a populated building. Ventilate closed spaces before entering.

Methods and Materials for Clean-up

Recovery: Shut off ventilation system if needed. Use water fog or spray to knock down and absorb vapors. Reuse, reprocess, recycle if possible. Completely contain spilled materials with dikes, sandbags, etc. Collect with appropriate absorbent and place into suitable container. Keep container tightly closed. Liquid material may be removed with a properly rated vacuum truck.

Neutralization: Due to the reactivity of hydrogen chloride gas and/or hydrochloric acid, neutralization for disposal purposes should be avoided whenever possible. Neutralization procedures are available by contacting OxyChem Technical Service Department at 800-733-1165 option #1. Neutralization procedures must be carried out ONLY by properly trained personnel wearing appropriate personal protective equipment and ONLY after thoroughly reviewing the neutralization procedures with manufacturer.

Final Disposal: For waste disposal, see SECTION 13.

Additional Disaster Prevention Measures: All storage tanks should be diked to contain the tank contents in the event of a spill or tank rupture. They should be large enough to contain the tank's volume, and an additional appropriate volume as a safety factor. Review regulations prior to construction. Ventilate closed spaces before entering. For other than minor leaks, immediately implement predetermined emergency plan.

SECTION 7. HANDLING AND STORAGE

Handling:

Precautions for Safe Handling: Use only equipment and hoses approved for this material. NEVER add water to product. Always add product to large quantities of water. When mixing, slowly add to water to minimize heat generation and spattering. Water or caustic solutions should never be added directly to this product because of violent reaction and spattering.

Technical measures/precautions: Hydrochloric acid is corrosive to metals including the following: carbon steel, stainless steel, nickel, Monel®1, bronze, brass, copper, Inconel®1, and aluminum. These are commonly used industrial materials. Great care should be taken to avoid contact of these materials with hydrochloric acid. Consult OxyChem® Hydrochloric Acid Handbook for additional tank / equipment specifications.

Other precautions: Use caution when diluting with water; DO NOT add water to acid, ALWAYS add acid to water while stirring to minimize release of heat, steam and fumes.

Prevention of contact: Do not get in eyes, on skin or on clothing. Wear protective gloves, protective clothing, eye, and face protection. Do not breathe mist, vapor, or spray. Use outdoors or in a well-ventilated area. Wash thoroughly after handling. Do not eat, drink, or smoke when using this product. Keep separated from incompatible substances. Keep only in original container or container compatible with product (see Section 7 - Safe Storage Conditions). Absorb spillage to prevent material damage. Avoid release to the environment.

Storage:

Safe Storage Conditions: Store and handle in accordance with all current regulations and standards. Store in rubber-lined steel, acid-resistant plastic or glass containers. Keep container tightly closed. Store in a cool, dry area. Store in a well-ventilated area. Keep away from heat, sparks and open flames. Keep separated from incompatible substances (see below or Section 10 of the Safety Data Sheet). Do not store in aluminum container or use aluminum fittings or transfer lines. Protect from physical damage. Dike and vent storage tanks.

Technical measures: Hydrochloric acid should be stored either in rubber-lined steel storage tanks or in fiberglass-reinforced plastic storage tanks. Storage tanks should have a concrete containment dike coated with an acid-resistance coating to confine any spilled product. Storage tanks should be equipped with instrumentation to accurately measure tank inventory and provide notification if the storage tank is approaching an over-filled condition. Consult OxyChem® Hydrochloric Acid Handbook for additional tank / equipment specifications.

Incompatible Materials: Reacts with strong bases (e.g., sodium hydroxide, ammonium hydroxide), aliphatic and aromatic amines, alkanolamines, and other alkaline materials. Incompatible with reactive metals and metal compounds (e.g., metal acetylides, carbides, and phosphides) that may generate flammable gases. Reacts with strong oxidizers (e.g., perchloric acid) and strong dehydrating agents (e.g., sulfuric acid, oleum). Also incompatible with acid anhydrides (e.g., acetic anhydride), isocyanates, epoxides (e.g., ethylene oxide), and chlorosulfonic acid, Corrosive to most common metals (e.g., carbon steel, aluminum, zinc), generating flammable hydrogen gas. May

degrade or attack certain non-metallic materials. Avoid contact with susceptible plastics (e.g., polyamides/nylon, acetal resins), elastomers (e.g., natural rubber), and non-resistant coatings or linings. Use only materials of construction demonstrated to be compatible with aqueous hydrochloric acid service.

Packaging or Materials of Construction: Hydrochloric acid should be stored in compatible, corrosion-resistant materials such as rubber-lined steel, fiberglass-reinforced plastic (FRP), or high-density polyethylene (HDPE) storage tanks. Material selection should be based on acid concentration, temperature, and service conditions, and must be verified for compatibility with aqueous hydrochloric acid.

Additional Information:
Never mix hydrochloric acid with bleach (sodium hypochlorite) or other strong oxidizers, as this can release toxic chlorine gas. Avoid contact with strong bases (e.g., sodium hydroxide), which can result in a highly exothermic neutralization reaction that may cause splattering or boiling. Hydrochloric acid is corrosive to most metals, potentially generating flammable hydrogen gas.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

REGULATORY EXPOSURE LIMIT(S):
Listed below for the product components that have regulatory occupational exposure limits (OEL's).

Component	OSHA - Final PELs - Time Weighted Averages (TWAs)	OSHA - Final PELs - Short Term Exposure Limits	OSHA Final PEL Ceiling
Hydrochloric Acid	-----	-----	5 ppm (Ceiling) 7 mg/m³ (Ceiling)

OEL: Occupational Exposure Limit; OSHA: United States Occupational Safety and Health Administration; PEL: Permissible Exposure Limit; TWA: Time Weighted Average; STEL: Short Term Exposure Limit
OSHA Ceiling values indicate the exposure limit, which at no time shall be exceeded. Instantaneous monitoring is the preferred method to determine compliance with OSHA Ceiling values. If instantaneous monitoring is not feasible, then the ceiling shall be assessed as a 15-minute time weighted average exposure which shall not be exceeded at any time during the working day [29 CFR § 1910.1000(a)(1)]

NON-REGULATORY EXPOSURE LIMIT(S):
Listed below for the product components that have non-regulatory occupational exposure limits (OELs).

Component	ACGIH TWA	ACGIH STEL	ACGIH Ceiling	Skin Absorption - ACGIH	NIOSH RELs	AIHA WEELs	OSHA TWA (Vacated)	OSHA STEL (Vacated)	OSHA Ceiling (Vacated)
Hydrochloric Acid	-----	-----	2 mg/m³ (Ceiling)	-----	5 ppm (Ceiling) 7 mg/m³ (Ceiling)	-----	-----	-----	5 ppm (Ceiling) 7 mg/m³ (Ceiling)

- The Non-Regulatory United States Occupational Safety and Health Administration (OSHA) limits, if shown, are the Vacated 1989 PEL's (vacated by 58 FR 35338, June 30, 1993). OSHA Ceiling values indicate the exposure limit, which at no time shall be exceeded. Instantaneous monitoring is the preferred method to determine compliance with OSHA Ceiling values. If instantaneous monitoring is not feasible, then the ceiling shall be assessed as a 15-minute

time weighted average exposure which shall not be exceeded at any time during the working day [29 CFR § 1910.1000(a)(1)]

- *The American Conference of Governmental Industrial Hygienists (ACGIH) is a voluntary organization of professional industrial hygiene personnel in government or educational institutions in the United States. The ACGIH develops and publishes recommended occupational exposure limits each year called Threshold Limit Values (TLVs: e.g., TWA, STEL, and/or Ceiling) for hundreds of chemicals, physical agents, and biological exposure indices. ACGIH TLV Ceiling (C) limits are airborne concentrations that should not be exceeded in the workplace under any circumstances. Ceiling limits can supplement other limits or stand alone.*

ENGINEERING CONTROLS: Use closed systems when possible. Provide local exhaust ventilation where vapor or mist may be generated. Ensure compliance with applicable exposure limits. Provide physical barriers for personnel splash protection at points in system that have potential for failure. A fume scrubber should be utilized as part of the storage system to eliminate the release of irritating and corrosive vapors into the workplace and atmosphere, both during unloading operations and during "static" storage conditions. Many localities require the use of a fume scrubber.

PERSONAL PROTECTIVE EQUIPMENT:

Eye and Face Protection: Wear chemical safety goggles with a face shield to protect against eye and skin contact when appropriate. Provide an emergency eyewash fountain and quick drench shower in the immediate work area.

Skin and Body Protection: Wear chemical resistant clothing and rubber boots when potential for contact with the material exists. Always place pants legs over boots.

Hand Protection: Wear appropriate chemical resistant gloves. If contact with forearms is likely, wear gauntlet style gloves. Consult a glove supplier for assistance in selecting an appropriate chemical resistant glove.

Protective Material Types: Nitrile, Neoprene, Butyl rubber, Polyvinyl chloride (PVC), Responder®, Trellchem® HPS, Tychem®.

Respiratory Protection: Where vapor or mist concentration exceeds or is likely to exceed applicable exposure limits, a NIOSH approved respirator with acid gas cartridges (appropriate for hydrogen chloride) is required. When an air-purifying respirator is not adequate, for exposures above the IDLH or for spills and/or emergencies of unknown concentrations, a NIOSH approved self-contained breathing apparatus or airline respirator with a full-face piece and with an auxiliary self-contained escape pack is required. A respiratory protection program that meets 29 CFR 1910.134 must be followed whenever workplace conditions warrant use of a respirator.

Component	Immediately Dangerous to Life/ Health (IDLH)
Hydrochloric Acid 7647-01-0 (31 - 36 %)	45 ppm IDLH 67 mg/m^3 IDLH

Other Protective Equipment: Provide an emergency eyewash fountain and quick drench shower in the immediate work area.

HYGIENE MEASURES: Do not breathe gas, fumes, vapor, mist, or spray. Wash hands and exposed skin and clothing thoroughly after handling. Do not touch eyes. Do not eat, drink, or smoke when using this product. Use only outdoors or in a well-ventilated area. Wear protective gloves, protective clothing, eye, and face protection.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear liquid
Physical State:	Liquid
Color:	Colorless
Odor:	Pungent, irritating odor
Odor Threshold [ppm]:	~0.3 to 10 ppm
Melting Point/Range:	-25.4 °C (-13.7° F) for a 39.17% w/w solution
Freezing Point/Range:	-17.14 °C (10.81% solution); -62.25 °C (20.69%); -46.2 °C (31.24%); -25.4 °C (39.17%)
Boiling Point °C	~ 84 °C (31 % HCl); ~75 °C (33 % HCl); ~48–50 °C (37 % HCl) @ 1 atm
Evaporation Rate (ether=1):	No data available
Flammability (solid, gas):	Not flammable
Lower Flammability Level (air):	Not combustible
Upper Flammability Level (air):	Not combustible
Explosion limits:	Not determined
Flash point:	Not applicable / Not flammable
Auto-ignition Temperature:	Not flammable
Decomposition Temperature:	Not applicable
pH:	0.10 (1.0 N HCl); 1.10 (0.1 N HCl); 2.02 (0.01 N HCl); 3.02 (0.001 N HCl); 4.01 (0.0001 N HCl)
Viscosity:	0.405 cP (liquid at 118.16 ◦K); 0.0131 cP (vapor at 273.06 ◦K); 0.0253 cP (vapor at 523.2 ◦K)
Dynamic Viscosity:	25% HCl ~ 1.0 to 1.2 cP 30-32% HCl ~ 1.5 to 1.7 mPas @ 20Ct 37% HCl ~ 1.7 to 2.0 cP at room temperature
Kinematic Viscosity:	Low, generally similar to water ~0.7 to 1.0 CSt (mm2/s)
Water Solubility:	720 g/L @ 20 °C
Partition Coefficient (n-octanol/water):	Not applicable
Vapor Pressure:	31-32% @ 25°C ~ 19-35 mmHg 35-36% @ 25°C ~ 90-165 mmHg
Density:	No data available
Relative Density:	1.05 at 59°F (15 °C) for 10.17% weight/weight solution
Relative Density/Specific Gravity (water=1):	1.05 - 1.18
Vapor Density (air=1):	1.268
Particle Size Distribution:	Not applicable

Other Information

Molecular Formula:	HCl
Chemical Family:	Inorganic Acid
Molecular Weight:	36.46
Explosive properties:	Not applicable
Oxidizing properties:	None
Bulk Density:	Not applicable
Crystallization Temperature:	Not applicable (see freezing point)
Volatility:	9 - 36% by volume
Surface Tension:	23 mN/cm at 118.16 K

Hygroscopic: Not applicable
Radioactivity: Not applicable

SECTION 10. STABILITY AND REACTIVITY

Chemical Stability: Stable at normal temperatures and pressures.

Reactivity: Hydrochloric acid reacts vigorously with alkalis and with many organic materials. Reacts with strong oxidizing materials causing the release of chlorine.

Possibility of Hazardous Reactions: Hazardous Reactions of Aqueous Hydrochloric Acid (HCl in Water)
1. Reaction with Metals: Is the most significant hazard for aqueous HCl; reacts with many metals such as iron / carbon steel, zinc, aluminum, and magnesium; produces hydrogen gas, which is flammable and explosive in confined or poorly ventilated spaces; corrosion rates increase with higher acid concentration and elevated temperature
2. Reaction with Bases and Alkalis: Neutralization reactions with sodium hydroxide, potassium hydroxide, calcium hydroxide, and ammonia solutions; strongly exothermic — rapid heat release can cause boiling and splattering and pressurization of closed containers
3. Reaction with Oxidizing Agents: May react violently with strong oxidizers, including hypochlorites (e.g., bleach), chlorates, chlorites (e.g., sodium chlorite), nitrates, and peroxides. Mixing with sodium hypochlorite can release chlorine gas, and mixing with sodium chlorite can release chlorine dioxide gas, both of which are highly toxic inhalation hazards
4. Reaction with Sulfides, Cyanides, and Carbides: Aqueous HCl liberates toxic gases when contacting certain salts for example sulfide salts yield hydrogen sulfide (H_2S), cyanide salts yield hydrogen cyanide (HCN), and carbide salts yield flammable hydrocarbons (e.g., acetylene); these gases pose acute inhalation and life safety hazards
5. Reaction with Carbonates and Bicarbonates: Reacts vigorously with materials like limestone, concrete, and sodium carbonate to produce carbon dioxide gas, which can cause foaming and overflow over pressurization of closed systems
6. Reaction with Organic Materials: Can degrade or react with amines, some polymers and resins, and certain alcohols (under specific conditions) which in some cases may be violent and heat-releasing.

Conditions to Avoid (e.g., static discharge, shock, or vibration): Attacks many metals in the presence of water forming flammable explosive hydrogen gas. Reacts violently with oxidants forming toxic chlorine gas. Avoid all incompatible substances.

Incompatible Materials: Reacts with strong bases (e.g., sodium hydroxide, ammonium hydroxide), aliphatic and aromatic amines, alkanolamines, and other alkaline materials. Incompatible with reactive metals and metal compounds (e.g., metal acetylides, carbides, and phosphides) that may generate flammable gases. Reacts with strong oxidizers (e.g., perchloric acid) and strong dehydrating agents (e.g., sulfuric acid, oleum). Also incompatible with acid anhydrides (e.g., acetic anhydride), isocyanates, epoxides (e.g., ethylene oxide), and chlorosulfonic acid. Corrosive to most common metals (e.g., carbon steel, aluminum, zinc), generating flammable hydrogen gas. May degrade or attack certain non-metallic materials. Avoid contact with susceptible plastics (e.g., polyamides/nylon, acetal resins), elastomers (e.g., natural rubber), and non-resistant coatings or linings. Use only materials of construction demonstrated to be compatible with aqueous hydrochloric acid service.

Hazardous Decomposition Products: Chlorine; Hydrogen chloride gas; Hydrogen gas

Hazardous Polymerization: Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

LIKELY ROUTES OF EXPOSURE AND POTENTIAL HEALTH EFFECTS:

TOXICITY:
Hydrochloric acid is corrosive to skin, eyes, and mucus membranes and causes immediate, severe irritation and corrosion of exposed tissue. Prolonged exposures may cause discoloration and erosion of teeth, gastritis, photosensitization, and bronchitis. Swallowing this material may be harmful.

ACUTE TOXICITY:

Eye contact: Causes serious eye damage. Eye exposure may cause irritation and burns to the eye lids, conjunctivitis, corneal edema, and corneal burn.

Skin contact: Can cause severe skin burns. Concentrated hydrochloric acid is corrosive to tissue, causing redness, irritation (possibly severe), burns, ulceration, scarring, and possible necrosis (tissue death).

Inhalation: Inhalation of this material may cause: irritation of the respiratory tract with sore throat, coughing, shortness of breath, hoarseness, laryngeal spasms, upper respiratory tract edema, inflammation and ulceration, hemorrhage, chest pain, and pulmonary edema.

Ingestion: Ingestion of concentrated hydrochloric acid can cause nausea, vomiting, abdominal pain, diarrhea, gastrointestinal bleeding, perforation, necrosis and scarring, acidosis, and sudden circulatory collapse. Harmful if swallowed.

CHRONIC TOXICITY:

Chronic Effects: Repeated or prolonged skin exposure to dilute solutions may result in dermatitis. Photosensitization has been reported in chronic occupational skin exposures. Discoloration and erosion of the teeth may occur as a result of long-term exposure. Chronic occupational inhalation exposure to hydrogen chloride gas and/or hydrochloric acid mists have been reported to cause chronic bronchitis.

SIGNS AND SYMPTOMS OF EXPOSURE:

Inhalation (Breathing): Hydrogen chloride gas and vapors are intensely irritating to the mucous membranes of the nose, throat, and respiratory tract. Brief exposure to 35 ppm causes throat irritation, and levels of 50 to 100 ppm are barely tolerable for 1 hour. The greatest impact is on the upper respiratory tract; exposure to high concentrations can rapidly lead to swelling and spasm of the throat and suffocation. Most seriously exposed persons have immediate onset of rapid breathing, blue coloring of the skin, and narrowing of the bronchioles. Patients who have massive exposures may develop an accumulation of fluid in the lungs. Exposure to hydrogen chloride can lead to Reactive Airway Dysfunction Syndrome (RADS), a chemically or irritant induced type of asthma. Children may be more vulnerable to corrosive agents than adults because of the relatively smaller diameter of their airways. Children may also be more vulnerable from exposure because of increased minute ventilation per kg and failure to evacuate an area promptly when exposed.

Skin: Exposure to hydrochloric acid can produce burns on the skin and mucous membranes, the severity of

which is related to the concentration of the solution. Subsequently, ulceration may occur, followed by keloid and retractile scarring. Hydrochloric acid is corrosive to tissue, causing redness, irritation (possibly severe), burns, ulceration, scarring, and possible necrosis (tissue death). Sudden circulatory collapse can occur with shock if large areas of skin have been burned. Severe burns have been fatal.

Eye: Acute exposure to hydrochloric acid solutions (>5%) and gaseous hydrochloric acid can cause severe irritation with corneal injury which may result in permanent impairment of vision.

Ingestion (Swallowing): Harmful if swallowed. Acute ingestion of concentrated hydrochloric acid may cause nausea, vomiting, abdominal pain, diarrhea, gastrointestinal bleeding, perforation, necrosis, and scarring, acidosis, and sudden circulatory collapse.

Interaction with Other Chemicals Which Enhance Toxicity: No interaction with other chemicals which enhance toxicity are known.

TOXICITY DATA:

PRODUCT TOXICITY DATA:

LD50 Oral:	LD50 Dermal:	LC50 Inhalation:
700 mg/kg (Rat)	>5010 mg/kg (Rabbit)	3124 ppm (1 hr - Rat), converted to 1562 ppm (4 hr - Rat)

COMPONENT TOXICITY DATA:
The component toxicity data is populated by the LOLI database and may differ from the product toxicity data given.

Component	Oral LD50	Dermal LD50	Inhalation LC50
Hydrochloric Acid 7647-01-0	238 - 277 mg/kg (Rat)	>5010 mg/kg (Rabbit)	= 1.68 mg/L (Rat) 1-hour LC50 (aerosol) of 1.68 mg/L/1h (equivalent to 0.42 mg/L over 4 hours)

EYE IRRITATION/CORROSION: Acute exposure to hydrochloric acid solutions (>5%) and gaseous hydrochloric acid can cause severe irritation with corneal injury which may result in permanent impairment of vision. This product is classified as causing serious eye damage (Category 1, H318) under GHS classification criteria.

SKIN IRRITATION/CORROSION: Hydrochloric acid solutions ≥ 10% and hydrogen chloride gas are corrosive to the skin. Exposure to hydrochloric acid can produce burns on the skin and mucous membranes, the severity of which is related to the concentration of the solution. Subsequently, ulceration may occur, followed by keloid and retractile scarring. This product is classified as causing severe skin burns and eye damage (Category 1A, H314), according to GHS classification criteria.

SKIN ABSORBENT/DERMAL ROUTE: NO.
Hydrogen chloride is not absorbed through the skin. Direct contact with aqueous solutions of hydrogen chloride or with concentrated vapor can cause severe chemical burns.

RESPIRATORY OR SKIN SENSITIZATION: No data are available to determine whether hydrochloric acid or hydrogen chloride gas meets the classification criteria for a category or subcategory of Respiratory Sensitization.

However, exposure to hydrogen chloride gas can lead to Reactive Airway Dysfunction Syndrome (RADS), a chemically or irritant induced type of asthma. No evidence of skin sensitization was seen in either human or laboratory animal exposure studies to hydrochloric acid.

CARCINOGENICITY: Hydrochloric acid and hydrogen chloride gas are classified by IARC and ACGIH as "not classifiable as to their carcinogenicity to humans," although strong inorganic acid mists, including those from hydrochloric acid, are classified as carcinogenic to humans. Human studies investigating cancer risk from exposure to hydrochloric acid or hydrogen chloride gas did not show a consistent elevated cancer risk, lacked sufficient supporting information, or failed to demonstrate a dose-response relationship. Animal studies similarly found no increased cancer risk, and the available data do not meet classification criteria for carcinogenicity.

Component	NTP:	IARC (GROUP 1):	IARC (GROUP 2):	OSHA:	ACGIH (American Conference of Governmental Industrial Hygienists)	NIOSH - Pocket Guide - Carcinogens
Hydrochloric Acid	Not listed	Not listed	Not listed	Not Listed	A4 - Not Classifiable as a Human Carcinogen	Not Listed

SPECIFIC TARGET ORGAN TOXICITY (Single Exposure): Product is classified as a Category 3 Respiratory Tract Irritant under GHS criteria. See inhalation hazard below.

SPECIFIC TARGET ORGAN TOXICITY (Repeated or Prolonged Exposure): Hydrochloric acid was studied for repeated-dose toxicity through oral and inhalation routes in animal models, but the effects observed either exceeded guidance values or reflected mild irritation or adaptive responses rather than specific target organ toxicity. Mortality and physiological changes were seen at high oral doses in rats, while inhalation studies in mice and rats mainly showed acute corrosive effects or mild, reversible nasal irritation. Overall, the available data do not meet the criteria for classification as causing Specific Target Organ Toxicity from repeated exposures.

INHALATION HAZARD: Due to its high solubility and rapid dissociation, hydrochloric acid in solution is not expected to be systemically available in organisms. The absorption and regulation of acids and chloride ions are well understood, and both remain tightly controlled for homeostasis. Acute exposure is therefore expected to cause local effects related to its corrosive properties, not systemic toxicity. Nonetheless, human cases and studies indicate adverse effects can occur after acute inhalation below classification limits. Therefore, the Category 4 classification is based on an inhalation LC50 value of 1.04 mg/L (4-hour; rat). In addition, aqueous hydrochloric acid is also classified as a Specific Target Organ Toxin (STOT) Single Exposure Category 3 (Respiratory Tract Irritant).

INGESTION HAZARD: Ingestion of concentrated hydrochloric acid can cause severe corrosive injury to the lips, mouth, throat, esophagus, and stomach.

GERM CELL/IN-VITRO MUTAGENICITY: Based on available toxicological data, hydrogen chloride (HCl) gas and hydrochloric acid solutions are not considered to be germ cell mutagens and are not expected to cause genetic effects in humans. While studies have shown some in vitro genotoxicity, these effects are largely attributed to extreme pH changes rather than direct DNA interaction, and they do not translate to in vivo, systemic mutagenicity.

REPRODUCTIVE TOXICITY: No information is available on the reproductive or developmental effects of hydrochloric acid in humans. Inhalation studies on mice and rats have not demonstrated reproductive harm at non-lethal doses. Some studies with very high, acute lethal inhalation doses have shown fetal toxicity, but this is

widely believed to be secondary to severe maternal distress, not direct toxicity to the fetus. Hydrogen chloride rapidly dissociates into hydrogen and chloride ions upon contact with moisture, which are natural body constituents, limiting its ability to affect distant reproductive organs.

DEVELOPMENTAL TOXICITY: Not classified as a developmental or reproductive toxin per GHS criteria.

ASPIRATION HAZARD: Not applicable. No human data are available and neither hydrochloric acid nor hydrogen chloride is a liquid hydrocarbon.

TOXICOKINETICS: The biological activity of hydrogen chloride is associated with its high solubility in water i.e., 23 moles/L at 0 deg C. The hydrogen chloride in water dissociates almost completely, with the hydrogen ion captured by the water molecules to form the hydronium ion. The hydronium ion becomes a donor of a proton that possesses catalytic properties and thus is capable of reacting with organic molecules. This may explain the ability of hydrogen chloride to induce cellular injury and necrosis.

METABOLISM: A rare and unusual complication of ingestion of high levels of hydrogen chloride is an increase in the concentration of chloride ions in the blood, causing an acid-base imbalance. Because of their higher metabolic rates, children may be more vulnerable to toxicants interfering with basic metabolism.

BIOLOGICAL DISTRIBUTION: No information available.

PATHOGENICITY AND ACUTE INFECTIOUSNESS (ORAL, DERMAL, AND INHALATION): Not applicable.

ENDOCRINE DISRUPTOR: Hydrogen chloride (HCl) is not classified as an endocrine disruptor by major regulatory bodies such as the U.S. Environmental Protection Agency (EPA) or the European Chemicals Agency (ECHA), and there is no evidence in the scientific literature that it directly mimics, blocks, or interferes with human hormone systems.

NEUROTOXICITY: The nervous system is not a primary target for HCl. However, massive inhalation can lead to acute respiratory distress (e.g., chemical pneumonitis, ARDS), which can cause hypoxia and secondary neurological effects such as confusion or loss of consciousness due to lack of oxygen. This is a secondary consequence of respiratory failure, not a direct neurotoxic effect.

IMMUNOTOXICITY: Not Available.

Health Hazards Not Otherwise Classified (HNOC) or Mentioned in GHS/CLP Classification
• Exposure to hydrogen chloride gas or vapors can lead to Reactive Airway Dysfunction Syndrome (RADS), a chemically or irritant induced type of asthma

SECTION 12. ECOLOGICAL INFORMATION

ECOTOXICITY (EC, IC, and LC):

Ecotoxicity - Available LOLI Data for Components: The component ecotoxicity data is populated by the LOLI database and may differ from the product ecotoxicity data given

Component:	*Freshwater Fish:*	*Invertebrate Toxicity:*	*Algae Toxicity:*	*Other Toxicity:*
Hydrochloric Acid 7647-01-0 (31 - 36 %)	282 mg/L LC50 96 h Gambusia affinis	56 mg/L EC50 72h Daphnia	No data available	No data available

Aquatic Toxicity:
ACUTE AQUATIC HAZARD - CATEGORY 3: Harmful to aquatic life.

Invertebrate Toxicity:
LC50 Shrimp: 100 - 330 mg/L.
72-hour EC50=56 mg/L for Crustacea (Daphnia magna).

FATE AND TRANSPORT:

PERSISTENCE: Anhydrous hydrochloric acid (aHCl) has low long-term environmental persistence because it is a strong acid that rapidly dissociates and neutralizes in the environment, although it causes significant short-term acute impacts and is highly mobile before neutralization. When released, it dissociates completely into hydrogen (H+) and chloride (Cl-) ions, rather than remaining as a molecular compound.

BIODEGRADATION: Anhydrous hydrochloric acid (aHCl) is not considered biodegradable in the traditional sense, as it is an inorganic compound that cannot be metabolized by microorganisms. However, it does not persist in the environment; instead, it undergoes a process of environmental neutralization rather than biodegradation.

BIOCONCENTRATION: Hydrochloric acid (HCl) does not undergo bioconcentration in the food chain. While it is highly soluble in water and ubiquitous in the environment, it behaves as a strong acid that dissociates completely into hydrogen and chloride ions, rather than accumulating in living tissues. This material is not expected to bioconcentrate in organisms.

BIOACCUMULATIVE POTENTIAL: Hydrochloric acid (HCl) has no potential for bioaccumulation in living organisms. It is considered to have a low bioaccumulative potential based on its chemical properties and behavior in environmental systems. Hydrogen chloride dissociates readily in water to chloride and hydronium ions. Therefore, hydrogen chloride does not accumulate in the aquatic organisms.

MOBILITY IN SOIL: Hydrogen chloride (HCl) dissociates into chloride and hydronium ions in moist soil. In summary, while it can be neutralized by high-pH soils, in most cases, HCl is highly mobile and poses a high leaching threat in wet, reducing, or acidic soils.

ADDITIONAL ECOLOGICAL INFORMATION: This material has exhibited toxicity to terrestrial organisms. May decrease pH of waterways and adversely affect aquatic life. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product into sewer systems without previously notifying the sewage treatment plant authority. For guidance, contact your local or regional regulatory water boards and/or other appropriate regulatory offices.

Persistent, Bioaccumulative, and Toxic (PBT) and Very Persistent and Very Bioaccumulative (vPvB) Assessment: Not applicable.
Because it dissociates immediately, is ubiquitous, and is regulated by biological systems, it is not considered to be a bioaccumulating or toxic (PBT) substance.

SECTION 13. DISPOSAL CONSIDERATIONS

Waste from material:
Hydrochloric acid waste is corrosive. Small quantities of uncontaminated material may be neutralized under controlled conditions by trained personnel and disposed of where permitted. Concentrated solutions, bulk quantities, or mixed wastes must be managed through an approved hazardous waste disposal program. Do not discharge unneutralized material to drains or the environment.

Container Management:
Dispose of container in accordance with applicable local, regional, national, and/or international regulations. Container rinsate must be disposed of in compliance with applicable regulations.

Contaminated Material:
Contaminated packaging must be disposed of as unused product by a licensed / permitted waste disposal service.

SECTION 14. TRANSPORT INFORMATION

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport. Shipment mode selection is subject to regulatory requirements and shipper and receiving-facility approvals.

LAND TRANSPORT

U.S. DOT 49 CFR 172.101:

UN NUMBER:	UN1789
PROPER SHIPPING NAME:	Hydrochloric acid solution
HAZARD CLASS/ DIVISION:	8
PACKING GROUP:	II
LABELING REQUIREMENTS:	8
RQ (Lbs.):	RQ 5,000 Lbs. (Hydrochloric acid)
Special provisions for transport:	Not applicable
ADDITIONAL INFORMATION:	Emergency Response Guide Number 157.

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

UN NUMBER:	UN1789
SHIPPING NAME:	Hydrochloric acid solution
CLASS OR DIVISION:	8
PACKING/RISK GROUP:	II
LABELING REQUIREMENTS:	8

MARITIME TRANSPORT (IMO / IMDG)

UN NUMBER:	1789
PROPER SHIPPING NAME:	Hydrochloric acid
HAZARD CLASS / DIVISION:	8
Packing Group:	II

LABELING REQUIREMENTS: 8

AIR TRANSPORT (ICAO / IATA)

Special Instructions CAO: IATA Certificate for shipping personnel is required

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: The substance poses risks from the point of view of safety (S) and contamination (P). Classified category “Z”, it presents a danger to marine resources or human health. Hydrochloric acid may be transported in bulk by sea in accordance with Annex II of MARPOL 73/78 and the International Bulk Chemical (IBC) Code, when carried as a liquid cargo in the fixed cargo tanks of ships certified under the IBC Code. Such transport is subject to applicable ship certification, operational, and pollution-prevention requirements.

SECTION 15. REGULATORY INFORMATION

U.S. REGULATIONS

OSHA REGULATORY STATUS:
Health hazard classifications were performed using OSHA Hazard Communication 2024 (1910.1200) Appendix A and/or UN GHS Rev. 8 (2019). This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):
If a release is reportable under CERCLA section 103, notify the state emergency response commission and local emergency planning committee. In addition, notify the National Response Center at (800) 424-8802 or (202) 426-2675.

Component	U.S. DOT Hazardous Substances/ RQs	CERCLA Hazardous Substances / RQs	CERCLA Section 302 EHS EPCRA RQs	Section 302 Threshold Planning Quantity (TPQ)
Hydrochloric Acid 7647-01-0 (31 - 36 %)	5000 lbs. (RQ)	5000 lbs. (RQ)	5000 lbs. (EPCRA RQ)	500 lbs. TPQ

SARA EHS Chemical (40 CFR 355.30)
If a release is reportable under EPCRA, notify the state emergency response commission and local emergency planning committee. If the TPQ is met, facilities are subject to reporting requirements under EPCRA Sections 311 and 312.

SARA HAZARD CATEGORIES ALIGNED WITH GHS (2018):
Health Hazard - Acute Toxin (any route of exposure)
Health Hazard - Skin Corrosion or Irritation
Health Hazard - Serious eye damage or eye irritation
Health Hazard - Specific Target Organ Toxicity (STOT) Single Exposure (SE)

EPCRA SECTION 313 (40 CFR 372.65):
The following chemicals are listed in 40 CFR 372.65 and may be subject to Community Right-to Know Reporting requirements.

Component	SARA 313 - Emission Reporting	SARA 313 PBT
Hydrochloric Acid 7647-01-0 (31 - 36)	1% (de minimis concentration)	Not Listed

DEPARTMENT OF HOMELAND SECURITY (DHS)- Chemical Facility Anti-Terrorism Standards (6 CFR 27):
This product is regulated under the U.S. Department of Homeland Security (DHS) Chemical Facility Anti-Terrorism Standards (CFATS) as follows:

Component	DHS - Security Issues	DHS-Sabotage Screening Threshold Qnty.	DHS-Sabotage Min. Conc.	DHS-Theft Screening Threshold Qnty.	DHS-Theft Min. Conc.	DHS-Release Screening Threshold Qnty.	DHS-Release Min. Conc.	CWC Toxic Chemicals:
Hydrochloric Acid 7647-01-0 (31 - 36)	Release - Toxic (concentration >=37%); Release - Toxic (anhydrous); Theft - Weapons of Mass Effect (anhydrous)	Not Listed	Not Listed	500 lbs. STQ (anhydrous)	a commercial grade; anhydrous	15000 lbs. STQ (concentration >=37%); 5000 lbs. STQ (anhydrous)	37.0% Minimum Concentration 1.0 % Minimum Concentration	Not Listed

OSHA PROCESS SAFETY (PSM) (29 CFR 1910.119):
Regulated.

Component	EPA RMP Toxic or Flammable TPQ	PSM - Highly Hazardous Substances, Toxics and Reactives	Flash Point
Hydrochloric Acid 7647-01-0 (31 - 36)	Toxic (15000 lbs. threshold quantity) Toxic (5000 lbs. threshold quantity)	5000 lbs. TQ; 5000 lbs. TQ (anhydrous)	-----

FDA: Hydrochloric acid is affirmed as Generally Recognized as Safe (GRAS) for use as a buffer and neutralizing agent in food, when used in accordance with good manufacturing practice (21 CFR 182.1057). This material has Generally Recognized As Safe (GRAS) status under specific U.S. Food and Drug Administration (FDA) regulations. Additional information is available from the Code of Federal Regulations, which is accessible on the FDA's website. Occidental Chemical Corporation's (OxyChem's) food grade product is guaranteed to be produced under all current Good Manufacturing Practices (cGMP) requirements as defined by the FDA. Food grade product is produced in a facility that is accredited as a Safe Quality Food (SQF) Level 2 Facility, certified under the Global Food Safety Initiative (GFSI), and meets the Food Chemical Codex (FCC) requirements.

EPA'S CLEAN WATER AND CLEAN AIR ACTS:
Regulated as noted in table below.

Component	Clean Water Act - Priority Pollutants	CAA - ODS CLASS 1 AND CLASS 2	CAA - Volatile Organic Compounds (VOCs) in SOCMI	CAA - HON Rule - Organic HAPs	CAA - Hazard Air Pollutants	CAA - Urban HAPs List (Integrated Urban Strategy)	SNAP - Substitutes for ODS	EPA RMP Toxic or Flammable TPQ
Hydrochloric Acid 7647-01-0 (31 - 36 %)	Not Listed	Not Listed	Not Listed	Not Listed	Present	Not Listed	Not Listed	Toxic (15000 lbs. threshold quantity) Toxic (5000 lbs. threshold quantity)

NATIONAL INVENTORY STATUS

U.S. INVENTORY STATUS: Toxic Substance Control Act (TSCA):

Component	TSCA Inventory	TSCA ACTIVE LIST	TSCA 12(b)	TSCA/Section 4	TSCA/Section 5	TSCA/Section 6	TSCA/Section 8

Hydrochloric Acid 7647-01-0 (31 - 36 %)	Listed	ACTIVE	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed

Canadian Chemical Inventory: All components of this product are listed on either the DSL or the NDSL.

Component	DSL	NDSL
Hydrochloric Acid 7647-01-0 (31 - 36)	Listed	Not Listed

STATE REGULATIONS

California Proposition 65:
This product is not listed on the California Governor's current list of Carcinogens, Reproductive Toxicants, and/or Candidate Carcinogens (Proposition 65), but it may contain trace amounts of impurities that are listed. For additional information, contact Occidental Chemical Corporation Customer Service (1-800-752-5151 or 1-972-404-3700).

Component	U.S. - California - Proposition 65 - Carcinogens List	CA. Prop. 65 Teratogen	California Proposition 65 CRT List - Male reproductive toxin:	California Proposition 65 CRT List - Female reproductive toxin:	Massachusetts Right to Know Hazardous Substance List	Rhode Island Right to Know Hazardous Substance List
Hydrochloric Acid 7647-01-0 (31 - 36 %)	Not Listed	Not Listed	Not Listed	Not Listed	Listed	Listed

Component	New Jersey Right to Know Hazardous Substance List	New Jersey Special Health Hazards Substance List	New Jersey - Environmental Hazardous Substance List	Pennsylvania Right to Know Hazardous Substance List	Pennsylvania Right to Know Special Hazardous Substances	Pennsylvania Right to Know Environmental Hazard List
Hydrochloric Acid	1012	Corrosive	Listed	Listed	Not Listed	Environmental hazard

CANADIAN REGULATIONS

This product has been classified in accordance with the hazard criteria of the Workplace Hazardous Materials Information System (WHMIS 2015) which includes the amended Hazardous Products Act (HPA) and the Hazardous Product Regulations (HPR).

Component	Canada - CEPA - Schedule I - List of Toxic Substances	Canada - NPRI	Canada - CEPA - Greenhouse Gases (GHG) Subject to Mandatory Reporting	Canadian Chemical Inventory:	NDSL
Hydrochloric Acid 7647-01-0 (31 - 36)	Not listed	Part 1, Group A Substance (105)	Not Listed	Listed on inventory	Not Listed

SECTION 16. OTHER INFORMATION

Prepared by: Occidental Chemical Corporation - HES&S Product Stewardship Department

Rev. Date: 10-Jun-2026

Reason for Revision:

• Scheduled review
• SDS format adopts revisions to the Hazardous Products Regulations (HPR) to include revisions to “Section 9: Physical and chemical properties” and ensures classification with at a minimum the seventh revised edition of GHS and certain elements from the eighth revised edition (Revision 8)
• SDS format adopts revisions to the OSHA's 2024 Hazard Communication Rule 29CFR 1910.1200 and ensures classification with at a minimum the seventh revised edition of GHS and certain elements from the eighth revised edition (Revision 8)

IMPORTANT:
Important: The information presented herein, while not guaranteed, was prepared by technical personnel and is true and accurate to the best of our current knowledge. NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, OR WARRANTY OR GUARANTY OF ANY OTHER KIND, EXPRESS OR IMPLIED, IS MADE REGARDING PERFORMANCE, SAFETY, SUITABILITY, STABILITY OR OTHERWISE. This information is not intended to be all-inclusive as to the manner and conditions of use, handling, storage, disposal, and other factors that may involve other or additional legal, environmental, safety or performance considerations, and Occidental Chemical Corporation assumes no liability whatsoever for the use of or reliance upon this information. Appropriate handling and use of the product remains the responsibility of the customer. No suggestions for use are intended as, and nothing herein shall be construed as, a recommendation to infringe any existing patents or to violate any Federal, State, local or foreign laws.

OSHA Standard 29 CFR 1910.1200 requires that information be provided to employees regarding the hazards of chemicals by means of a hazard communication program including labeling, safety data sheets, training and access to written records. We request that you, and it is your legal duty to, make all information in this Safety Data Sheet available to your employees.

End of Safety Data Sheet