Safety Data Sheet · OSHA HCS 2024

Hydrochloric Acid 31% ACS Grade

ACS · 31% w/w

Standard	Revised	Emergency
OSHA HCS 2024 · GHS Rev. 7	2026-11-19	Chemtel 1-800-255-3924 (24/7)

1 Identification

Product Identifier	Hydrochloric Acid 31% ACS Grade
Grade	ACS
Concentration	31% w/w
CAS Number	7647-01-0
Chemical Formula	ClH
Molecular Weight	36.46 g/mol
Manufacturer	Alliance Chemical 204 South Edmond Street, Taylor, TX 76574
Emergency Phone	Chemtel 1-800-255-3924 (24/7)
Synonyms	Muriatic acid (20 °Bé); hydrogen chloride solution
Recommended Use	Laboratory reagent (ACS grade): titration, digestion, pH adjustment and analytical chemistry.
Restrictions on Use	For industrial and professional use. Never mix with bleach or other oxidizers: this releases toxic chlorine gas. Always add acid to water.

2 Hazard Identification



Corrosive



Irritant / harmful

Classification

Corrosive to metals, Category 1

Skin corrosion/irritation, Category 1

Serious eye damage/eye irritation, Category 1

Specific target organ toxicity, single exposure, Category 3 (respiratory tract irritation)

Signal Word

Danger

Hazard Statements

H290 May be corrosive to metals

H314 Causes severe skin burns and eye damage

H335 May cause respiratory irritation

Precautionary Statements

P234 Keep only in original packaging.

P260 Do not breathe dust, fume, gas, mist, vapors or spray.

P261 Avoid breathing dust, fume, gas, mist, vapors or spray.

P264 Wash hands and face thoroughly after handling.

P271 Use only outdoors or in a well-ventilated area.

P280 Wear protective gloves, protective clothing, and eye/face protection.

P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.

P304+P340 IF INHALED: Remove person to fresh air and keep 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.

P321 Specific treatment (see first-aid information on this label).

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 a corrosion resistant container with a resistant inner liner.

P501 Dispose of contents and container in accordance with local, regional, national, and international regulations.

Classification, hazard (H) and precautionary (P) statements and pictograms per OSHA HCS 2024 (29 CFR 1910.1200, Appendices A–C), aligned with GHS Rev. 7.

3 Composition / Information on Ingredients

Component	CAS No.	Formula	Concentration
Hydrochloric acid (hydrogen chloride)	7647-01-0	HCl	30.5-31.5% (w/w)
Water	7732-18-5	H2O	Balance (w/w)

Concentrations are nominal; lot-specific values appear on the Certificate of Analysis. Components not contributing to classification are omitted.

4 First-Aid Measures

Eyes

Rinse with plenty of water for at least 15 minutes. Remove contact lenses if present and easy to do. Continue rinsing. Seek medical attention immediately.

Skin

Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing. Wash with soap. Get medical attention immediately.

Inhalation

Move person to fresh air and keep comfortable for breathing. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention immediately.

Ingestion

Do Not Induce Vomiting! Never give anything by mouth to an unconscious person. If conscious, wash out mouth with water. Get medical attention immediately.

Most Important Symptoms and Effects

Causes burns to the skin, eyes and mucous membranes; eye contact may cause permanent damage including blindness; ingestion burns the mouth, throat and stomach.

Inhalation may irritate the nose, throat and respiratory tract (coughing, sore throat).

Immediate Medical Attention and Special Treatment

Immediate medical attention is required after eye or skin contact or ingestion; tissue damage may continue after exposure ends.

5 Fire-Fighting Measures

Suitable Extinguishing Media	Dry chemical, CO2, water spray. Use water spray to cool containers.
Unsuitable Extinguishing Media	Do not use a solid water stream as it may scatter and spread fire.
Specific Hazards Arising from the Chemical	Fire may release corrosive and toxic gases. Containers may rupture when heated.
Protective Equipment	Wear self-contained breathing apparatus and full protective clothing.
Hazardous Combustion Products	Hydrogen chloride gas. Contact with metals releases hydrogen; contact with oxidizers releases chlorine.

6 Accidental Release Measures

Personal Precautions	Use PPE as described in Section 8. Ensure adequate ventilation. Evacuate personnel to safe areas.
Hazard-Specific Precautions	Do not touch spilled material without protective equipment. Neutralize residue only with a method suitable for the material, then collect.
Environmental Precautions	Prevent leakage or spillage from entering drains, sewers, or waterways.
Containment & Cleanup	Absorb with inert material. Collect in appropriate waste container. Dispose per applicable regulations.

7 Handling and Storage

Safe Handling	Use with adequate ventilation. Avoid contact with skin, eyes, and clothing. Wash thoroughly after handling. Keep container closed when not in use.
Safe Storage	Store in a cool, dry, well-ventilated area. Use corrosion-resistant containers. Keep away from incompatible materials (see Section 10). Keep containers tightly closed.
Specific Storage Precautions	Store in a cool, well-ventilated area out of direct sunlight in closed, vented, corrosion-resistant containers (polyethylene or glass). Keep away from bleach and other oxidizers, bases and metals.

8 Exposure Controls / Personal Protection

Occupational Exposure Limits

Limit	Value
OSHA PEL	5 ppm ceiling
ACGIH TLV	2 ppm Ceiling
NIOSH REL	5 ppm ceiling
IDLH	50 ppm

Engineering Controls	Use adequate ventilation. Provide eyewash stations and quick-drench showers accessible to areas of use.
Eye/Face Protection	Wear chemical safety goggles or face shield.
Skin Protection	Wear chemical-resistant gloves and protective clothing.

Respiratory Protection	Where mist, spray or dust is generated (e.g., spraying, atomization, pressure washing), use a NIOSH-approved half-face air-purifying respirator with combination acid gas / P100 cartridges. Ensure local exhaust ventilation.

Exposure limits sourced from NIOSH Pocket Guide, OSHA 29 CFR 1910.1000 and ACGIH TLVs.

9 Physical & Chemical Properties

Appearance	Clear, colorless to slightly yellow liquid
Odor	Pungent, acrid odor
Odor Threshold	4.7 ppm at 25 °C
pH	< 1
Melting Point / Freezing Point	-46.9 °C (-52.5 °F), freezing point
Boiling Point	~85-90 °C (fumes)
Flash Point	Not flammable
Evaporation Rate	< 1 (n-butyl acetate = 1)
Flammability (solid, gas)	No data available
Upper/Lower Flammability or Explosive Limits	No data available
Vapor Pressure	35–40 mmHg at 30 °C (86 °F)
Vapor Density	1.27 (air = 1)
Relative Density	1.156 at 20/20 °C (water = 1)
Solubility	Completely miscible with water
Partition Coefficient (n-octanol/water)	No data available
Auto-ignition Temperature	No data available
Decomposition Temperature	No data available
Viscosity	1.55 mPa·s at 30 °C
Particle Characteristics	Not applicable
Form	Liquid
Density	1.1543 g/cm^3 at 20 °C

Values shown reflect product-specific canonical data. Lot-specific ranges may vary; see the Certificate of Analysis for the shipped lot.

10 Stability and Reactivity

Reactivity	May be corrosive to metals.
Chemical Stability	Stable under recommended storage conditions.
Possibility of Hazardous Reactions	None under normal processing conditions.
Conditions to Avoid	Heat, direct sunlight and ultraviolet light, and contact with incompatible materials.
Incompatible Materials	Bases, hydroxides, carbonates, amines and ammonia; oxidizers, including sodium hypochlorite (bleach) (release chlorine gas); most metals and metal oxides, including iron, copper, nickel and aluminum (release flammable hydrogen); cyanides, sulfides and sulfites (release toxic gases); formaldehyde.
Hazardous Decomposition Products	Hydrogen chloride gas. Contact with metals releases hydrogen; contact with oxidizers releases chlorine.

11 Toxicological Information

See below for route-specific acute toxicity data.

Likely Routes of Exposure	Inhalation, skin contact, eye contact, ingestion.
Symptoms	Causes burns to the skin, eyes and mucous membranes; eye contact may cause permanent damage including blindness; ingestion burns the mouth, throat and stomach. Inhalation may irritate the nose, throat and respiratory tract (coughing, sore throat).
Delayed and Chronic Effects	No delayed or chronic effects identified beyond the classification in Section 2.

Route	Value
LD50 Oral (rat)	700 mg/kg
LC50 Inhalation	3124 ppm (hydrogen chloride gas, rat, 1 h)

Carcinogen Classification

Agency	Status
IARC	Group 3 — not classifiable as to its carcinogenicity to humans (Hydrochloric acid; IARC agent: Hydrochloric acid, Vol. 54).
NTP	Not listed as carcinogen.
OSHA	Not listed as carcinogen.

12 Ecological Information

Ecotoxicity	Aquatic invertebrates EC50: ~ 100 mg/L (48 h, Marine crustaceans — pH-driven; shrimp 100–330 ppm; Carcinus maenas 240, Crangon crangon 260 mg/L)
Persistence & Degradability	Not applicable (inorganic; dissociates to chloride and hydronium ions)
Bioaccumulative Potential	log Kow 0.25, BCF Does not bioaccumulate
Mobility in Soil	Not Available

13 Disposal Considerations

Dispose of contents/container in accordance with applicable federal, state, and local regulations. Do not dispose of into drains or waterways.

If discarded, this material may be a corrosive hazardous waste (EPA RCRA D002, 40 CFR 261.22): aqueous with pH ≤ 2 or ≥ 12.5, or a liquid that corrodes steel at more than 6.35 mm per year. The waste generator must make the final hazardous-waste determination.

14 Transport Information

US DOT (49 CFR)

UN Number	UN1789
Proper Shipping Name	Hydrochloric acid

Hazard Class	8
Packing Group	II

IMDG / IATA classifications may differ from US DOT. Verify current regulations before international shipment.

15 Regulatory Information

Inventory / List	Status
California Proposition 65	Not listed
US EPA TSCA Active Inventory	Listed
EPCRA SARA 313 (TRI)	Listed as acid aerosols including mists, vapors, gas, fog, and other airborne forms of any particle size
CERCLA Reportable Quantity (RQ)	Hydrochloric acid / hydrogen chloride (CAS 7647-01-0) 5,000 lb (2,270 kg), about 15,900 lb of 31.45% solution. EPCRA Section 313 (TRI): reportable only in aerosol forms (mists, vapors, gas, fog).

SARA 311/312 hazard categories correspond to the GHS classification in Section 2. Data retrieved as of: California Proposition 65 2026-11-02; US EPA TSCA Active Inventory 2026-11-02; EPCRA SARA 313 (TRI) 2026-11-02.

16 Other Information

Revision Date	2026-11-19
Format	16-section format per OSHA HCS 2024 (29 CFR 1910.1200, Appendix D), aligned with GHS Rev. 7.

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