Safety Data Sheet · OSHA HCS 2024

# Hydrochloric Acid 5% ACS Grade

ACS · 5% 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 5% ACS Grade |
| Grade | ACS |
| Concentration | 5% w/w |
| CAS Number | 7647-01-0 |
| Chemical Formula | HCl |
| Molecular Weight | 36.46 g/mol |
| Manufacturer | Alliance Chemical<br>204 South Edmond Street, Taylor, TX 76574 |
| Emergency Phone | Chemtel 1-800-255-3924 (24/7) |
| Synonyms | Muriatic acid (dilute); 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 | 4.5-5.5% (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

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| 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 when heated. Contact with metals releases hydrogen; contact with oxidizers releases chlorine. |

## 6 Accidental Release Measures

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| 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

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|---|---|
| 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 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 |

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| 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. |

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| **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

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| **Appearance** | Clear, colorless liquid |
| **Odor** | Pungent, irritating odor |
| **Odor Threshold** | No data available |
| **pH** | < 1 |
| **Melting Point / Freezing Point** | About -6 °C (21 °F), freezing point |
| **Boiling Point** | About 101 °C (214 °F) |
| **Flash Point** | Not applicable |
| **Evaporation Rate** | No data available |
| **Flammability (solid, gas)** | No data available |
| **Upper/Lower Flammability or Explosive Limits** | No data available |
| **Vapor Pressure** | About 17 mmHg at 20 °C (mostly water vapor) |
| **Vapor Density** | No data available |
| **Relative Density** | 1.025 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** | No data available |
| **Particle Characteristics** | Not applicable |
| **Form** | Liquid |
| **Density** | 1.0228 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

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| **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 contact with incompatible materials. |
| **Incompatible Materials** | Bases, hydroxides, carbonates, amines and ammonia; oxidizers, including sodium hypochlorite (bleach) (release chlorine gas); most metals (release flammable hydrogen); cyanides and sulfides (release toxic gas). |
| **Hazardous Decomposition Products** | Hydrogen chloride gas when heated. Contact with metals releases hydrogen; contact with oxidizers releases chlorine. |

## 11 Toxicological Information

See below for route-specific acute toxicity data.

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| 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.<br>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 |
|---|---|
| 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

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| 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.

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|---|---|
| EPA RCRA Waste Codes | D002 (corrosive, pH ≤ 2, 40 CFR 261.22). Not a P- or U-listed waste. |

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)

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| UN Number | UN1789 |
| Proper Shipping Name | Hydrochloric acid |
| Hazard Class | 8 |

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| Packing Group | III |

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 90,900 lb or 10,600 US gal of 5% solution; no single package reaches it. EPCRA Section 313 (TRI): reportable only in aerosol forms. |

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

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| 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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