

Hydrogen chloride

Safety Data Sheet P-4606

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1984 Revision date: 10/17/2016 Supersedes: 03/19/2015

SECTION: 1. Product and company identification

1.1. Product identifier

Product form	: Substance
Name	: Hydrogen chloride
CAS No	: 7647-01-0
Formula	: HCl
Other means of identification	: Anhydrous hydrochloric acid

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture	: Industrial use. Use as directed.
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1.3. Details of the supplier of the safety data sheet

Praxair, Inc.
10 Riverview Drive
Danbury, CT 06810-6268 - USA
T 1-800-772-9247 (1-800-PRAXAIR) - F 1-716-879-2146
www.praxair.com

1.4. Emergency telephone number

Emergency number	: Onsite Emergency: 1-800-645-4633
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CHEMTRAC, 24hr/day 7days/week
— Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887
(collect calls accepted, Contract 17729)

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

GHS-US classification

Liquefied gas	H280
Acute Tox. 3 (Inhalation:gas)	H331
Skin Corr. 1A	H314
Eye Dam. 1	H318

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :



GHS04 GHS05 GHS06

Signal word (GHS-US) :

: DANGER

Hazard statements (GHS-US) :

: H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED

H314 - CAUSES SEVERE SKIN BURNS AND EYE DAMAGE

H331 - TOXIC IF INHALED

CGA-HG22 - CORROSIVE TO THE RESPIRATORY TRACT

Precautionary statements (GHS-US) :

: P202 - Do not handle until all safety precautions have been read and understood

P261 - Avoid breathing gas

P262 - Do not get in eyes, on skin, or on clothing

P271+P403 - Use and store only outdoors or in a well-ventilated place

P280+P284 - Wear protective gloves, protective clothing, eye protection, respiratory protection, and/or face protection

P405 - Store locked up

P501 - Dispose of contents/container Dispose in a safe manner in accordance with local/national regulations

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CGA-PG05 - Use a back flow preventive device in the piping
 CGA-PG20+CGA-PG10 - Use only with equipment of compatible materials of construction and rated for cylinder pressure
 CGA-PG12 - Do not open valve until connected to equipment prepared for use
 CGA-PG18 - When returning cylinder, install leak tight valve outlet cap or plug
 CGA-PG06 - Close valve after each use and when empty
 CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F)

2.3. Other hazards

Other hazards not contributing to the classification : None.

2.4. Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/Information on ingredients

3.1. Substance

Name	Product identifier	%
Hydrogen chloride (Main constituent)	(CAS No) 7647-01-0	100

3.2. Mixture

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation

: Remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, trained personnel should give oxygen. Call a physician. . WARNING: To avoid possible chemical burns, the rescuer should avoid breathing any exhaled air from the victim.

First-aid measures after skin contact

: In case of contact, immediately flush affected areas with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash clothing before reuse. Discard contaminated shoes.

First-aid measures after eye contact

: Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately.

First-aid measures after ingestion

: Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

No additional information available

4.3. Indication of any immediate medical attention and special treatment needed

Obtain medical assistance.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

: Does not burn. Use extinguishing agents compatible with acid and appropriate for the burning material.

5.2. Special hazards arising from the substance or mixture

Reactivity

: No reactivity hazard other than the effects described in sub-sections below.

5.3. Advice for firefighters

Firefighting instructions

: **DANGER! Toxic, corrosive, liquefied gas.**

Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.



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Special protective equipment for fire fighters : Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : **DANGER: Toxic. Corrosive.** Wear a self-contained breathing apparatus and appropriate personal protective equipment (PPE). (gas tight, chemical-protective) Evacuate personnel to a safe area. Approach suspected leak area with caution. Remove all sources of ignition. Toxic, corrosive vapor can spread from spill. Ventilate area or move container to a well-ventilated area. Before entering the area, especially a confined area, check the atmosphere with an appropriate device.

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Try to stop release. Reduce vapor with fog or fine water spray. Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

6.3. Methods and material for containment and cleaning up

No additional information available

6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling

: Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g. wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions

: Store in a cool, well-ventilated place. Store and use with adequate ventilation. Store only where temperature will not exceed 125°F (52°C). Firmly secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

7.3. Specific end use(s)

None.

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SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Hydrogen chloride (7647-01-0)		
ACGIH	ACGIH TLV-C (ppm)	2 ppm
USA OSHA	OSHA PEL (Ceiling) (mg/m ³)	7 mg/m ³
USA OSHA	OSHA PEL (Ceiling) (ppm)	5 ppm
USA IDLH	US IDLH (ppm)	50 ppm
ACGIH	Not established	

8.2. Exposure controls

Appropriate engineering controls : Use a corrosion-resistant local exhaust ventilation system with sufficient air flow velocity to maintain concentration below all applicable exposure limits in the worker's breathing zone. A canopy-type, forced-draft fume hood is preferred.

Hand protection : Neoprene rubber (HNBR) /.

Eye protection : Provide readily accessible eye wash stations and safety showers. Wear safety glasses when handling cylinders; vapor-proof goggles and a face shield during cylinder changeout or whenever contact with product is possible. Select eye protection in accordance with OSHA 29 CFR 1910.133.

Skin and body protection : Wear metatarsal shoes and work gloves for cylinder handling, and protective clothing where needed. Wear appropriate chemical gloves during cylinder changeout or wherever contact with product is possible. Select per OSHA 29 CFR 1910.132, 1910.136, and 1910.138.

Respiratory protection : When workplace conditions warrant respirator use, follow a respiratory protection program that meets OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable). Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

Thermal hazard protection : Wear cold insulating gloves when transfilling or breaking transfer connections.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Gas
Appearance	: Colorless gas.
Molecular mass	: 36.5 g/mol
Color	: Colorless. Gives off white fumes in moist air.
Odor	: Pungent.
Odor threshold	: No data available
pH	: Not applicable.
Relative evaporation rate (butyl acetate=1)	: No data available
Relative evaporation rate (ether=1)	: Not applicable.
Melting point	: -114 °C
Freezing point	: No data available
Boiling point	: -85 °C
Flash point	: Not applicable.
Critical temperature	: 51.4 °C
Auto-ignition temperature	: Not applicable.
Decomposition temperature	: No data available
Flammability (solid, gas)	: Not Applicable
Vapor pressure	: 4260 kPa
Critical pressure	: 8310 kPa
Relative vapor density at 20 °C	: No data available

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Relative density	: 1.2
Density	: 1.161 - 1.19 g/cm ³ (at 20 °C)
Relative gas density	: 1.3
Solubility	: Water: 720000 mg/l
Log Pow	: Not applicable.
Log Kow	: Not applicable.
Viscosity, kinematic	: 0.092 cSt Not applicable.
Viscosity, dynamic	: Not applicable.
Explosive properties	: Not applicable.
Oxidizing properties	: None.
Explosion limits	: Non flammable.

9.2. Other information

Gas group	: Liquefied gas
Additional information	: Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level

SECTION 10: Stability and reactivity

10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

May occur.

10.4. Conditions to avoid

Avoid moisture in installation systems.

10.5. Incompatible materials

Most common metals and their alloys. Bases. unsaturated organics. metal carbides. Fluorine. metal acetylides. potassium permanganate. sulfuric acid.

10.6. Hazardous decomposition products

Hydrogen. Chlorine. Chlorides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Inhalation:gas: TOXIC IF INHALED.

Hydrogen chloride (1f)7647-01-0

LD50 oral rat	238 - 277 mg/kg
LD50 dermal rabbit	> 5010 mg/kg
LC50 inhalation rat (ppm)	3120 ppm/1h
ATE US (oral)	238.000 mg/kg body weight
ATE US (gases)	1560.000 ppmV/4h

Skin corrosion/irritation : CAUSES SEVERE SKIN BURNS AND EYE DAMAGE.

pH: Not applicable.

Serious eye damage/irritation : CAUSES SERIOUS EYE DAMAGE.

pH: Not applicable.

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

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Hydrogen chloride (7647-01-0)	
IARC group	3 - Not classifiable
Reproductive toxicity	: Not classified
Specific target organ toxicity (single exposure)	: Not classified
Specific target organ toxicity (repeated exposure)	: Not classified
Aspiration hazard	: Not classified

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : No known ecological damage caused by this product.

12.2. Persistence and degradability

Hydrogen chloride (7647-01-0)	
Persistence and degradability	Not applicable for inorganic gases.

12.3. Bioaccumulative potential

Hydrogen chloride (7647-01-0)	
Log Pow	Not applicable.
Log Kow	Not applicable.
Bioaccumulative potential	No data available.

12.4. Mobility in soil

Hydrogen chloride (7647-01-0)	
Mobility in soil	No data available.
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.

12.5. Other adverse effects

Other adverse effects : May cause pH changes in aqueous ecological systems.
 Effect on ozone layer : None
 Effect on the global warming : No known effects from this product

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations : Do not attempt to dispose of residual or unused quantities. Return container to supplier.

SECTION 14: Transport information

In accordance with DOT

Transport document description : UN1050 Hydrogen chloride, anhydrous, 2.3
 UN-No.(DOT) : UN1050
 Proper Shipping Name (DOT) : Hydrogen chloride, anhydrous
 Class (DOT) : 2.3 - Class 2.3 - Poisonous gas 49 CFR 173.115
 Hazard labels (DOT) : Poison Gas
 2.3 - Poison gas
 8 - Corrosive





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DOT Special Provisions (49 CFR 172.102)	: 3 - This material is poisonous by inhalation (see 171.8 of this subchapter) in Hazard Zone C (see 173.116(a) of this subchapter), and must be described as an inhalation hazard under the provisions of this subchapter N86 - UN pressure receptacles made of aluminum alloy are not authorized N89 - When steel UN pressure receptacles are used, only those bearing the "H" mark are authorized
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Additional information

Emergency Response Guide (ERG) Number	: 125 (UN1050);157 (UN1789)
Other information	: No supplementary information available.
Special transport precautions	: Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

Transport by sea

UN-No. (IMDG)	: 1050
Proper Shipping Name (IMDG)	: HYDROGEN CHLORIDE, ANHYDROUS
Class (IMDG)	: 2 - Gases
MFAG-No	: 125

Air transport

UN-No. (IATA)	: 1050
Proper Shipping Name (IATA)	: Hydrogen chloride, anhydrous
Class (IATA)	: 2
Civil Aeronautics Law	: Gases under pressure/Gases toxic under pressure

SECTION 15: Regulatory information

15.1. US Federal regulations

Hydrogen chloride (7647-01-0)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Listed on the United States SARA Section 302	
Subject to reporting requirements of United States SARA Section 313	
EPA TSCA Regulatory Flag	T - T - indicates a substance that is the subject of a Section 4 test rule under TSCA
CERCLA RQ	5000 lb
SARA Section 302 Threshold Planning Quantity (TPQ)	500 lb (gas only)
SARA Section 311/312 Hazard Classes	Delayed (chronic) health hazard Immediate (acute) health hazard Sudden release of pressure hazard
SARA Section 313 - Emission Reporting	1.0 % (acid aerosols including mists, vapors, gas, fog, and other airborne forms of any particle size)

15.2. International regulations

CANADA

Hydrogen chloride (7647-01-0)
Listed on the Canadian DSL (Domestic Substances List)

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EU-Regulations

Hydrogen chloride (7647-01-0)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

15.2.2. National regulations

Hydrogen chloride (7647-01-0)

Listed on the AICS (Australian Inventory of Chemical Substances)
 Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
 Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
 Listed on the Korean ECL (Existing Chemicals List)
 Listed on NZIoC (New Zealand Inventory of Chemicals)
 Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
 Japanese Poisonous and Deleterious Substances Control Law
 Listed on the Canadian IDL (Ingredient Disclosure List)
 Listed on INSQ (Mexican National Inventory of Chemical Substances)
 Listed on CICR (Turkish Inventory and Control of Chemicals)

15.3. US State regulations

Hydrogen chloride(7647-01-0)

U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Other information

: When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product

Praxair asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Praxair, Inc, it is the user's obligation to determine the conditions of safe use of the product

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NFPA health hazard

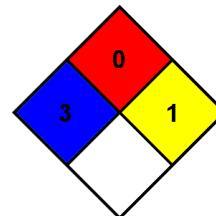
: 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.

NFPA fire hazard

: 0 - Materials that will not burn.

NFPA reactivity

: 1 - Normally stable, but can become unstable at elevated temperatures and pressures or may react with water with some release of energy, but not violently.



HMIS III Rating

Health	: 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given
Flammability	: 0 Minimal Hazard
Physical	: 3 Serious Hazard

SDS US (GHS HazCom 2012) - Praxair

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.