



**GUJARAT FLUORO CHEMICALS LIMITED**  
**GLOBAL PRODUCT STRATEGY SAFETY SUMMARY**  
**HYDROCHLORIC ACID**

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**ISSUED : 28.08.2020**

**REVISION : 00**

This product safety summary is intended to provide a general overview of the chemical substance in the context of ICCA global product strategy. It is not intended to provide emergency response, medical or treatment information nor to provide an overview of all safety and health information. This summary is not intended to replace the Safety Data Sheet. For detailed guidance on the use or regulatory status of this substance, please consult the Safety Data Sheet.

**A. CHEMICAL PRODUCT IDENTIFICATION:**

Product Name	Hydrochloric acid (solutions); Anhydrous Hydrogen chloride (gas)
Synonyms	Hydrogen chloride, Anhydrous hydrochloric acid, Chlorohydric acid, Hydrochloric acid gas, Hydrochloride, Muriatic acid
IUPAC Name	Hydrogen chloride
CAS NO	7647-01-0
E C No	231-595-7
Molecular Formula	HCl

**B. USES AND APPLICATIONS:**

- ✓ Hydrogen chloride is an acid/gas used in pharmaceutical industry, fine chemistry and large scale substance manufacturing (including petroleum products). It is also used in the formulation of preparations and/or re-packaging (excluding alloys), and for electronics applications.

**C. PHYSICAL / CHEMICAL PROPERTIES:**

Properties	Value - HCl Solution	Value - HCl Anhydrous
Physical state and appearance	Light yellow colored liquid	Compressed gas
Odor	No data available	No data available
Molecular Weigh	36.458 g/mol	36.458 g/mol
Color:	Light yellow	colorless
Boiling Point	No data available	-85°C / -121°F



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Melting Point / Range	-30°C / -22°F	No data available
Flash Point	No data available	No data available
Specific Gravity	1.18 g/cm <sup>3</sup> at 20°C	1.639 g/L at 20°C
Critical Temperature	No information available	No information available
Relative Density	1.18 g/cm <sup>3</sup> at 20°C	1.639 g/L at 20°C
Vapor Pressure	19 kPa at 25°C	4620 kPa at 20°C
Vapor Density	No information available	No information available
Volatility	No information available	No information available
Odor Threshold	No data available	No data available
Partition Coefficient	Not information available	No information available
Water Solubility	Miscible	500 g/L at 20°C
Explosive/oxidising properties	No information available	Non oxidizing/explosive

**D. HEALTH EFFECTS:**

The substance, both as a gas and as an aqueous solution, is a strong acid and is therefore strongly corrosive to human tissues. However, hydrochloric acid exists naturally as a major component of gastric acid, maintaining a pH of 1-2 in the stomach.

Effect	Value	
Acute Toxicity Oral / inhalation / dermal	ORAL LD50: - DERMAL LD50: - INHALATION LC50: -  Based on available information, According to GHS product is not classified as Acutely Toxic.	ORAL LD50: - DERMAL LD50: - INHALATION LC50: 4701 ppm  Based on available information, According to GHS product is classified as Acutely Toxic.
Irritation / corrosion Skin / eye/ respiratory tract	Causes severe skin burns. Causes serious eye damage. May cause respiratory irritation.	Causes severe skin burns. Causes serious eye damage. Toxic if inhaled.
Sensitisation	Based on available data, the classification criteria are not met.	Based on available data, the classification criteria are not met.
Toxicity after repeated exposure	Based on available data, the classification criteria are not met.	Based on available data, the classification criteria are not met.



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Oral / inhalation / dermal		
Mutagenicity/Teratogenicity	Based on available data, the classification criteria are not met.	Based on available data, the classification criteria are not met.
Carcinogenicity	Based on available data, the classification criteria are not met.	Based on available data, the classification criteria are not met.
Toxicity for reproduction	Based on available data, the classification criteria are not met.	Based on available data, the classification criteria are not met.

**E. ENVIRONMENTAL EFFECTS:**

In contact with water, Hydrogen chloride immediately dissociates and decreases the pH value. HCl is very toxic to algae and aquatic invertebrates and harmful to fish, however, due to its rapid dissociation and the buffer capacity of the environment, this substance is not classified. If emitted, the gas will quickly partition to the atmosphere where it will photo degrade into chloride free radical in a few weeks, while the solution will stay in water and partly volatilise to the atmosphere. Neither will partition significantly to soil or sediment, and they are not expected to bio accumulate in the food chain as ions H<sup>+</sup>/Cl<sup>-</sup> are naturally present in living organisms.

Effect Assessment	Value	
Aquatic Toxicity	Toxicity to Fish LC50: - Toxicity to aquatic Invertebrate EC50: - Toxicity to Algae EC10: -  Based on available information, According to GHS product is not classified for Aquatic Toxicity.	Toxicity to Fish Effect concentration: 20.5 mg/L Toxicity to aquatic Invertebrate Effect concentration: 0.45 mg/L Toxicity to Algae EC 50: 0.73 mg/L  Based on available information, According to GHS product is not classified for Aquatic Toxicity.

Fate and behavior	Value	
Degradation/Persistence	Not biodegradable. Hydrochloric acid will likely be neutralized to chloride by naturally occurring alkalinity present in environment.	Based on available information, Persistence is unlikely.
Bio-accumulation	Bio-accumulation is unlikely.	Bio-accumulation is unlikely.
PBT/vPvB conclusion	No data available for assessment.	No data available for assessment.



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\*: Persistent, Bio accumulative and Toxic (PBT)

\*\* : very Persistent and very Bio accumulative (vPvB)

**F. EXPOSURE :**

Human health	
Consumers	<p>Consumers may use Hydrochloric acid solutions (maximum concentration: 20%) for private Households. Exposure is limited by the warning effect of the well-known local corrosive/irritant.</p> <p>Properties: gloves are worn and inhalation is limited.</p> <p>Indirect exposure via the environment is not relevant: hydrochloric acid consists in ions H<sup>+</sup> and Cl<sup>-</sup> Which are commonly present in the environment, animals and humans.</p>
Workers	<p>Hydrogen chloride and its solutions are industrially manufactured and used mainly in closed Systems in a continuous or batch process, minimizing the occupational exposure potential. Workers may be exposed during cleaning, maintenance, transfer (notably for formulation), Sampling and analysis.</p> <p>Some professional uses involve specific use processes such as roller application, spraying, treatment of articles, hand-mixing, etc. These processes involve higher exposure but workers are specifically trained and risks are controlled by adequate collective and individual risk management measures.</p> <p>Procedures, controls, collective and personal risk management measures are in place, which Limit the occupational exposure during the manufacture and use of the substance. Workers Who might accidentally come into contact with the gas or the solutions should follow the safety Measures recommended in the relevant Extended Safety Data Sheet.</p> <p>Based on the risk assessment, the risk is controlled when activities are carried out under conditions recommended in the Extended Safety Data Sheet (see Chap. 8 and Exposure Scenarios).</p>



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**Environment**

Hydrogen chloride and its solutions are industrially manufactured and used mainly in closed systems in a continuous or batch process, minimizing release to the environment.

Procedures, controls and risk management measures are in place, which limit the Environmental exposure.

Professional uses such as activities related to cleaning may involve a higher environmental release fraction, but due to lower tonnages and wide-spread use, local releases are low.

The main expected release compartment is the atmosphere for the gas, and water (with Partial volatilisation to the atmosphere) for the solutions. In the aquatic environment, the Solution immediately dissociates into ions  $H^+$  and  $Cl^-$  which are normal environmental Constituents. The relevant exposure determinant is more the effect on pH than the exposure to these ions. pH is buffered in environmental media. In the atmosphere, the gas Photo degrades in a few weeks.

Based on the risk assessment, the risk is controlled when activities are carried out under Conditions recommended in the Extended Safety Data Sheet.

## **G. RISK MANAGEMENT MEASURES**

Effect	Value
Eyes	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Skin protection	Remove/Take off immediately all contaminated clothing including shoes. Rinse skin with water or shower. In case of reddened skin or burns seek medical advice.
Ingestion	Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Call a Physician or poison control center immediately.
Inhalation	Remove to fresh air. If not breathing, give artificial respiration. Does not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediate medical attention is required.



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**H. PERSONAL PROTECTIVE EQUIPMENT AND EMERGENCY MEASURES**

Effect		Value
Engineering controls		Ensure that eyewash stations and safety showers are close to the workstation location. Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimize release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source.
Special risks , Specific hazards		The product causes burn of eyes, skin and mucous membranes. Thermal decomposition can lead to release of toxic and corrosive vapour/gases.
Personnel Protective equipment	Eye/Face protection	Tightly fitting safety goggles. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).
	Skin protection	Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it. Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
	Hand protection	Inspect gloves before use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves.



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		<table border="1"> <thead> <tr> <th>Glove material</th> <th>Breakthrough time</th> <th>Glove thickness</th> <th>EU standard</th> <th>Glove comments</th> </tr> </thead> <tbody> <tr> <td>Butyl rubber</td> <td>&gt; 480 minutes</td> <td>0.20 mm</td> <td>Level 6</td> <td rowspan="5">As tested under EN374-3 Determination of Resistance to Permeation by Chemicals</td> </tr> <tr> <td>Neoprene</td> <td>&gt; 480 minutes</td> <td>0.35 mm</td> <td>EN 374</td> </tr> <tr> <td>Nitrile rubber</td> <td>&gt; 480 minutes</td> <td>0.45 mm</td> <td></td> </tr> <tr> <td>PVC</td> <td>&gt; 480 minutes</td> <td>0.18 mm</td> <td></td> </tr> <tr> <td>Viton (R)</td> <td>&gt; 480 minutes</td> <td>0.30 mm</td> <td></td> </tr> </tbody> </table> <p>(Refer to manufacturer/supplier for information) gloves are suitable for the task: Chemical compatibility, Dexterity, Operational conditions, User susceptibility, e.g. sensitization effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion. gloves with care avoiding skin contamination.</p>	Glove material	Breakthrough time	Glove thickness	EU standard	Glove comments	Butyl rubber	> 480 minutes	0.20 mm	Level 6	As tested under EN374-3 Determination of Resistance to Permeation by Chemicals	Neoprene	> 480 minutes	0.35 mm	EN 374	Nitrile rubber	> 480 minutes	0.45 mm		PVC	> 480 minutes	0.18 mm		Viton (R)	> 480 minutes	0.30 mm	
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	Respiratory protection	When workers are facing concentrations above the exposure limit, they must use appropriate certified respirators. To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly.																										

**I. ACCIDENTAL RELEASE MEASURES**

- ✓ **Use proper personal protective equipment (pl refer MSDS)**
- ✓ Person Precautions: Avoid contact with skin and eyes. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. In enclosed areas: ventilate or wear a self-contained breathing apparatus. Remove all sources of ignition. Do not smoke. Evacuate personnel to safe areas.
- ✓ Environmental precautions: Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). May be harmful to the environment if released in large quantities.
- ✓ Spill cleanup measures: Collect leaking product in suited acid-proof containers. Stop the leakage by shutting valves, if this can be done safely. Immediately contact emergency personal. Isolate affected area. Approach from upwind. Ventilate the premises. Eliminate all sources of ignition, and do not generate flames or sparks. Keep away materials and products which are incompatible with the product.


**J. FIRE FIGHTING MEASURES**

Suitable Extinguishing Media	Water spray, Carbon dioxide (CO <sub>2</sub> ), dry chemical, alcohol-resistant foam. Water mist can be used to cool the closed containers.
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## **K. CLASSIFICATION AND LABELLING**


Under GHS substances are classified according to their physical, health, and environmental hazards. The hazards are communicated via specific labels and the eSDS. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers, and emergency responders) can better understand the hazards of the chemicals in use. Substances registered for REACH are classified according CLP (EC) 1272/2008, implementation of the GHS in the European Union.

For Gas:

Classification H280 H331 H314	Gases under pressure – Compressed gas: Category 1 Acute oral toxicity: Category 3 Skin corrosion/irritation: Category 1A
Pictogram	
Signal Word	Danger
Hazard statements H280 H331 H314	Contain gas under pressure; may explode if heated. Toxic if inhaled. Causes severe skin burns and eye damage.
Precautionary statements P261 P271 P280 P264 P301+P330+P331 P303+P361+P353 P363	Avoid breathing dust/fume/gas/mist/vapour spray. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/ face protection. Wash face, hands and skin thoroughly after handling. IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair) : Take off immediately all contaminated clothing. Rinse skin with water/shower Wash contaminated clothing before reuse.

P304+P340	<p>IF INHALED: Remove victim to fresh air and keep at rest in comfortable position for breathing.</p> <p>IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTRE or doctor/physician.</p> <p>Protect from sunlight. Store in a well-ventilated space.</p> <p>Store in a well-ventilated place. Keep container tightly closed.</p> <p>Store locked up.</p> <p>Dispose of contents/container to an approved waste disposal plant.</p>
P305+P351+P338	
P310	
P410+P403	
P403+P233	
P405	
P501	

**For Solution:**

<p>Classification</p> <p>H290</p> <p>H314</p> <p>H335</p>	<p>Substance or mixture corrosive to metals: Category 1</p> <p>Skin corrosion/irritation: Category 1B</p> <p>Specific target organ toxicity – Single Exposure(SE): Category 1</p>
<p>Pictogram</p>	
<p>Signal Word</p>	<p>Danger</p>
<p>Hazard statements</p> <p>H290</p> <p>H314</p> <p>H335</p>	<p>May be corrosive to metal.</p> <p>Causes severe skin burns and eye damage.</p> <p>May cause respiratory irritation.</p>
<p>Precautionary statements</p> <p>P234</p> <p>P260</p> <p>P271</p> <p>P280</p> <p>P264</p> <p>P390</p> <p>P301+P330+P331</p>	<p>Keep only in original container.</p> <p>Do not breathe fume/gas/mist/vapour spray.</p> <p>Use only outdoors or in a well-ventilated area.</p> <p>Wear protective gloves/protective clothing/eye protection/ face protection.</p> <p>Wash face, hands and skin thoroughly after handling.</p> <p>Absorb spillage to prevent material damage.</p> <p>IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.</p>



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P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P363	<b>P363</b> Wash contaminated clothing before reuse.
P304+P340	IF INHALED: Remove victim to fresh air and keep at rest in comfortable position 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 CENTRE or doctor/physician.
P406	Store in corrosive resistant/container with a resistant inner linear.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/container to an approved waste disposal plant.

**L. BASIC TRANSPORT INFORMATION**

DOT / TDG/ IATA/ IMDG/IMO		
Product form	Solution	Gas
UN No.	UN 1789	UN 1050
Proper shipping Name	Hydrochloric Acid	Hydrogen Chloride, anhydrous
Technical name	Hydrochloric Acid	Hydrogen Chloride, anhydrous
Hazard Class	8	2.3(8)
Environmental Hazard	No	No
IATA Passenger		Not permitted for transport
IATA Cargo		Not permitted for transport

**M. REGULATORY INFORMATION**



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✓ **International Inventories**

TSCA	Complies
EINECS/ ELINCS	Complies
DSL/NDSL	Complies
PICCS	Complies
ENCS	Complies
IECSC	Complies
AICS	Complies
KECL	Complies

**Legend**

**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory

**DSL/NDSL** - Canadian Domestic Substances List/Non-Domestic Substances List

**EINECS/ELINCS** - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

**PICCS** - Philippines Inventory of Chemicals and Chemical Substances

**ENCS** - Japan Existing and New Chemical Substances

**IECSC** - China Inventory of Existing Chemical Substances

**AICS** - Australian Inventory of Chemical Substances

**KECL** - Korean Existing and Evaluated Chemical Substances

**N. CONCLUSIONS**

- ✓ Hydrogen chloride is used in pharmaceutical intermediates.
- ✓ Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.
- ✓ By applying the appropriate Risk Management measures the concentrations to be expected at workplaces and to the general public are below recommended exposure limits

**O. CONTACT INFORMATION**

Company Name	GUJARAT FLUOROCHEMICALS LIMITED
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