

### Material Safety Data Sheet

#### ANHYDROUS HYDROGEN CHLORIDE GAS (AHCI)

##### **Section 1 - Product and Company Information**

Substance	: Hydrogen Chloride gas Anhydrous
Trade Name	: Hydrochloric acid gas, Hydrochloride
Chemical Family	: Acid
Company	: Shiva Pharmachem Ltd. (SPL)
	Plot No. 588,
	Village Luna – 391440
	Taluka Padra,
	District: Vadodara, Gujarat,
	India.
Phone No.	: +91-2662-221021 / 224360
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##### **Section 2 – Hazards Identification**

**Physical state** : Gas (Colourless to slightly yellow liquefied compressed gas with an irritating odour or colourless fuming gas with pungent irritating odour)

**Emergency overview:** Danger!  
Causes severe respiratory tract, eye and skin burn. Harmful if inhaled. May cause target organ damaged, based on animal data. Contents under pressure. Do not puncture or incinerate container. Do not breathe gas. Do not get on skin or clothing. Use only with adequate ventilation. Contact with rapidly expanding gas can cause frostbite.

**Target organs** : May cause damage to lungs. Upper respiratory tract, skin and eyes.

**Routes of entry** : Inhalation, dermal, eyes.

##### **Potential acute health effect**

**Eyes** : Severely corrosive to the eyes. Causes severe burns. Contact with rapidly expanding gas may cause burns or frostbite.

**Skin** : Severely corrosive to the skin. Causes severe burns. Contact with rapidly expanding gas may cause burns or frostbite.

**Inhalation** : Toxic by inhalation. Severely corrosive to the respiratory system.

**Ingestion** : Ingestion is not a normal route of exposure for gases

FPA Ratings	:	Health	3
	:	Fire	0
	:	Reactivity	1

Scale                      0 = No hazard      1 = Slight hazard      2 = Moderate Hazard  
                                 3 = Serious Hazard      4 = Severe Hazard

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### **Section 3 - Composition / Information on Ingredients**

Product Name	CAS No.	EC No.	Mol. Formula	Mol. Wt.
Anhydrous Hydrogen Chloride	7647-01-0	231-595-7	HCl	36.5

#### **Exposure Limits**

ACGIH TLV (United States, 1/2009).

C: 2 ppm

NIOSH REL (United States, 6/2009).

CEIL: 7 mg/m<sup>3</sup>

CEIL: 5 ppm

OSHA PEL (United States, 11/2006).

CEIL: 7 mg/m<sup>3</sup>

CEIL: 5 ppm

OSHA PEL 1989 (United States, 3/1989).

CEIL: 7 mg/m<sup>3</sup>

CEIL: 5 ppm

### **Section 4 – First Aid Measures**

No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

**Eye contact:** Flush the eyes with plenty of water immediately for a minimum 15 minutes. Seek Immediate medical attention. Persons working in the area of use should avoid wearing contact lenses.

**Skin contact:** Remove contaminated clothing and Shoes. Simultaneously wash skin with soap and water for a minimum of 15 Minutes. Seek medical attention.

**Inhalation:** Take affected person immediately to Fresh air in case of any adverse effect, provide Oxygen if breathing is difficult. Seek medical attention immediately.

**Ingestion:** Give plenty of water or milk. Never administer fluid to unconscious person or allow vomiting. If person is unconscious turn head to side. Seek Immediate medical attention. If person is conscious, allow vomiting to occur. When vomiting occurs, keep head below than his hips to prevent aspiration.

**Frostbite:** Try to warm up the frozen tissues and seek medical attention.

**Advice for Medical Attendant:** Give oxygen for inhalation. Avoid gastric lavage or emesis. Victims of over-exposure should kept under medical observation for 24 to 48 hours. The hazards of this Material is mainly due to its severely irritant and corrosive properties on skin and mucosal surfaces. There is no specific Antidote. Treatment of over-exposure should be directed at the control of symptoms and the clinical condition of the patient.

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### **Section 5 – Fire Fighting Measures**

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**Fire and Explosion Hazards:** Non-flammable. Reacts with water in a corrosive manner to liberate Hydrogen gas. Also reacts with many organic chemicals with liberation of heat. Exposure of the Containers to heat should be avoided.

**Extinguishing Media:** Carbon dioxide and Dry Chemical.

**Large fires:** Use regular foam or use sprinkler for water Spray.

**Fire fighting:** Wear appropriate protective equipment and self-contained breathing (SCBA). Avoid water ingress. If possible, remove container to safer area and cool with water spray. Stay away from container.

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### **Section 6 – Accidental Release Measures**

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**Air Release:** Use sprinkler for water spray to reduce vapors. Keep out of low areas. Collect contaminated water and dispose as per Federal rules.

**Soil Release:** Use lime or limestone to neutralize the released Acid. Prepare Dykes to avoid Spreading of the released acid.

**Water Release:** Use Alkaline Material such as Lime or Limestone to neutralize released Acid.

**Occupational Release:**

Stop leakage, if possible, without personal risk. Divert the AHCl release to the Scrubber / Absorber System through Vacuum Hoses wherever is Possible. Blanket the vapors with water spray do not spray water directly on the damaged part or point of release. Do not allow water to go inside the Container. Small spills should be controlled by flooding with water and large spills should be controlled in a Dyke, to be neutralized and disposed off safely as per local federal rules. Train operators for prevention and emergency control. Person should wear Self-contained breathing apparatus and take all safety precautions while handling the emergency

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### **Section 7 - Handling and Storage**

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Store and handle in accordance with all Current Regulations and Standards. Protect from physical damage. Store in a cool and dry place and avoid exposure from direct sunlight and source of heat. Store in well-ventilated, cool and dry area of non-combustible construction. Keep separately and away from incompatible substances.

The Temperature at the Storage area should never be allowed to exceed 50 - 52 °C.

Cylinders must be stored upright and firmly secured with chain to prevent falling or being knocked over. Full and empty Cylinders should be segregated. Use a FIFO inventory System to prevent full Cylinders from being stored for excessive periods of time. Do not drag, slide or roll Cylinders. Use a suitable hand truck for cylinder movement. Use a specified and approved pressure reducing

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regulator when connecting cylinder to lower pressure piping or systems. Do not heat Cylinder by any means to increase the discharge rate of Product from the Cylinder.

Avoid breathing and contact of vapor or liquid in eyes, skin or on clothing. Safety Showers and eyewash fountains shall be maintained properly and made immediately available. Ensure that piping and equipments are designed to withstand pressure to be encountered. Tightly close cylinder valve after use. Keep it closed even cylinder is empty. To prevent reverse flow, use a check Valve or other protective device in any line or piping from the cylinder. Reverse flow in cylinder may cause rupture. If there is a leak, close the cylinder valve. Blow the System down in a safe and environmentally sound manner in compliance with statutory regulations then repair the leak. Follow safe practices when returning the cylinders to supplier. Be sure valve is closed; then tightly install valve outlet plug and cap.

Lime Stone and enough water should be available during transport. Leaking Cylinder should be taken to an isolated place. Initially the leak will be more and will rapidly become less due to cooling of the Cylinder. The area should be sprayed with water and neutralized with Lime Stone. Universal pH indicator paper should be used for checking the pH of the Water on the ground.

Keep unnecessary people away, isolate hazard area and deny entry. Always stay upwind and keep out of low areas.

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### **Section 8 - Exposure Controls / Personal Protection**

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#### **Ventilation:**

Provide a local exhaust or process enclosure Ventilation System. Ensure compliance with applicable Exposure Limits.

#### **Eye protection:**

Wear Splash Resistant Safety goggles with a Face Shield. Provide an emergency Eye-wash fountain and Quick Drench Shower in the immediate work area.

#### **Skin protection:**

Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

#### **Respiratory:**

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

**Hands:** Wear Appropriate Chemical resistant Hand Gloves

#### **Personal protection Clothing:**

Wear appropriate Chemical resistant Cloth. Full chemical-resistant suit and self-contained breathing apparatus should be worn only by trained and authorized persons.

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#### **Section 9 - Physical and Chemical Properties**

Physical state	:	Gas
Color	:	Colorless
Odor	:	Irritating pungent odor
Molecular Weight	:	36.46 g / mole
Molecular Formula	:	HCl
Boiling Point	:	(-) 85°C (-) 121°F
Freezing Point	:	(-) 114°C (-) 173°F
Critical Temperature	:	51.5°C (124.7°F)
Vapor Pressure	:	51.0 Kg/cm <sup>2</sup> g @ 30°C or 86°F
Vapor Density (Air=1)	:	1.268
Specific Gravity (Water=1)	:	1.187 @ (-) 85°C
Specific Volume (ft 3/lb)	:	10.5263
Gas Density (lb/ft 3)	:	0.095
pH	:	Acidic in solution
Volatility	:	Not Applicable
Threshold Limit Value (Odor)	:	OSHA PEL 5 ppm Max TLV-ACGIH 5 ppm Max
Soluble in	:	Water, Alcohol, Ether, Benzene and Methanol
Solubility in Water	:	82.3 % at 0°C

#### **Section 10 - Stability and Reactivity**

**Stability and Reactivity :** The product is stable.

**Conditions to avoid :** Direct contact of the cylinder with heat and its sources.

**Incompatibilities :** Cast iron, Zinc, Brass, Galvanized Iron, Aluminium, Copper, Copper Alloys, Cyanides, Amines, Bases, Metal Carbides. Oxidizing Materials, Acids, Combustible Materials.

**Hazardous Decomposition product:** Under normal conditions of storage and use, hazardous decomposition products should not be produced.

**Polymerization :** Does not Polymerize.

#### **Section 11 - Toxicological Information**

<b>Carcinogen Status</b>	:	Inadequate evidence for Humans and Animals.
<b>Local Effects (Corrosive)</b>	:	Inhalation, Eye, Skin and Ingestion.
<b>Toxicity Data</b>	:	LC 50 3124 ppm/1 hr (Inhalation – Rat) LC 50 1108 ppm/1 hr (Inhalation – Mouse) LD 50 900 mg/Kg (Oral – Rabbit)
<b>IDLH</b>	:	50 ppm

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### **Section 12 - Ecological Information**

**Aquatic ecotoxicity:**

Acute LC50 282000 ug/L Fresh water Fish – Western mosquitofish - Gambusia affinis – Adult, 96 hours

Acute LC50 260000 ug/L Marine water Crustaceans - Common shrimp, sand shrimp - Crangon crangon – Adult, 48 hours

Acute LC50 240000 ug/L Marine water Crustaceans - Green or European shore crab – Carcinus maenas – Adult, 48 hours

**Environmental fate:** Data Not available.

**Environmental hazards:** Significant effects or critical hazards are not known.

**Toxicity to the environment:** Data Not available.

### **Section 13 – Disposal Consideration**

Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State; local regulation. Return cylinders with residual product to Shiva Pharmachem Ltd .Do not dispose off locally.

### **Section 14 - Transport Information**

Transporting Name	:	Hydrogen Chloride, Anhydrous
ID Number	:	UN 1050
Hazard Class or Division	:	2.3
Labeling requirements	:	2.3 (Poison Gas), 8 (Corrosive)
Additional shipping Description	:	As per specific requirements

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

### **Section 15 - Regulatory Information**

**U.S. Federal regulations:**

**United States inventory (TSCA 8b):** This material is listed or exempted.

**SARA 302/304/311/312 extremely hazardous substances:** Hydrogen chloride

**SARA 302/304 emergency planning and notification:** Hydrogen chloride

**SARA 302/304/311/312 hazardous chemicals:** Hydrogen chloride

**SARA 311/312 MSDS distribution - chemical inventory - hazard identification:**

Hydrogen chloride: Sudden release of pressure, Immediate (acute) health hazard,  
Delayed (chronic) health hazard

**Clean Water Act (CWA) 307:** No products were found.

**Clean Water Act (CWA) 311:** Hydrogen chloride

**Clean Air Act (CAA) 112 accidental release prevention:** Hydrogen chloride

**Clean Air Act (CAA) 112 regulated flammable substances:** Hydrogen chloride

**Clean Air Act (CAA) 112 regulated toxic substances:** Hydrogen chloride

**State regulations**

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**WHMIS (Canada)** Class A: Compressed gas.

Class D-1A: Material causing immediate and serious toxic effects (Very toxic).

Class E: Corrosive material

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#### **Section 16- Additional Information**

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Always secure Cylinders in an upright position before transporting them. Never transport Cylinders in trunks of vehicles, enclosed vans, and truck cabs or in passenger compartments. Transport Cylinders secured in flat bed or in open pick-up type vehicles.

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