

Precision Gas Products Inc.

2455 Cawthra Road, Unit 21 Mississauga, Ontario L5A 3P1

Tel: (905)-949-2626/1-888-730-8196

Fax: (905)-949-2688

Emergency Contact: Chemtrec (800) 424-9300

Hydrogen Chloride in Nitrogen 0.0001-0.02%

MATERIAL SAFETY DATA SHEET

Identification

Formula: Not Applicable

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Document Number: MSDS 136N

Composition and Information on Ingredients

Chemical Name	CAS #	Mole %	Exposure Limits in Air					Other ppm
			ACGIH		OSHA			
			TLV ppm	STEL ppm	PEL ppm	STEL ppm	IDLH ppm	
Hydrogen Chloride	7647-01-0	0.0001 - 0.02%	NE	C 5	NE	C 5	50	NIOSH REL; C .5ppm DFG MAK 0.5 ppm IARC-3
Nitrogen	7727-37-9	Balance	There are no specific exposure limits for Nitrogen. Nitrogen is a simple Asphyxiant(SA). Oxygen levels should be maintained above 19.5%.					

NE=Not Established. C=Ceiling Limit. A4=Not Classifiable as a Human Carcinogen. See Section 16 for Definitions of Terms Used.

Note: All WHMIS required information is included.

HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This clear, pungent-smelling, greenish gas mixture is severely irritating. Persons who respond to releases must protect themselves from inhalation of Hydrogen Chloride, the corrosive component of this gas mixture, especially in areas where are downwind of the release. Another significant health hazard associated with this gas mixture is the potential for exposure to oxygen-deficient atmosphere. Extreme caution must be used when responding to spills.

Hazardous Material Information System

❖ HEALTH	(Blue)	3
❖ FLAMMABILITY	(Red)	0
❖ REACTIVITY	(Yellow)	0

INHALATION: Due to the small size of an individual cylinder of this product, no unusual health effects from over-exposure to the product are anticipated under routine circumstances of use. If this product is released in a small, poorly-ventilated area (i.e. an enclosed or confined space), over-exposure to Hydrogen Chloride enriched or oxygen-deficiency environment may occur. Inhalation of Hydrogen Chloride, a component of this gas mixture, may lead to irritation of the nose and throat. Additionally, over-exposure to Hydrogen Chloride can cause the following health effects: coughing, labored breathing, sore throat, and potentially fatal lung disorders (chemical pneumonitis and pulmonary edema). Repeated Hydrogen Chloride – overexposures by inhalation can result in emphysema and erosion in teeth.

CONCENTRATION OF HYDROGEN CHLORIDE

< 1ppm:
10-50ppm:
50-100ppm:
1000-1300ppm:
1300ppm:

OBSERVED EFFECT

Odor threshold.
Irritation of the eyes and mucous membranes
Immediate irritation of the throat.
A dangerous health hazard, even for short period of time.
May cause laryngeal spasm, resulting in death.

Health Effects or Risks from Exposure; Over-exposure to this gas mixture may cause the following health effects:

- ❖ **Acute:** Due to the small size of the individual cylinder of this product, no unusual health effects from exposure to the product are anticipated under routine circumstances of use. This gas mixture is severely irritating and may redden and damage eyes, skin, mucous membranes, and any other exposed tissue. Another significant hazard associated with this gas mixture is the potential for exposure to oxygen-deficient atmospheres. Symptoms of oxygen deficient include respiratory difficulty, ringing in ears, headache, shortness of breathing, wheezing, headaches, dizziness, indigestion, nausea, unconsciousness, and death. The skin of a victim of over-exposure may have a blue color.
- ❖ **Chronic:** Persistent irritation of the skin develops after exposure to this mixture.
- ❖ **Target Organs:** Respiratory system, skin, and eyes.

First Aid Measures

Rescuers should not attempt to retrieve victims of exposure to this product without adequate personal protective equipment. *If necessary, Self - Contained Breathing Apparatus must be worn.* No unusual health effects are anticipated after exposure to this product, due to the small cylinder size. If any adverse symptom develops after over-exposure to this product, remove victim(s) to fresh air as quickly as possible. Only trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation if necessary. Victim(s) who experience any adverse effect after over-exposure to this product must be taken for medical attention. Rescuers should be taken for medical attention if necessary. Take a copy of the label and the MSDS to physician or other health professional with victim(s).

Skin Exposure: If irritation of the skin develops after exposure to this gas mixture, immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Remove exposed or contaminated clothing, taking care not to contaminated eyes. Victim must seek immediate medical attention.

Eye Exposure: If irritation of the eye develops after exposure to this gas mixture, open victim's eyes under gentle running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Seek medical assistance immediately, preferably an ophthalmologist.

Fire Fighting Measures

Flash Point, (method): Not applicable.

Autoignition Temperature: Not applicable.

Flammable Limits (in air by volume %):

Lower (LEL): Not applicable

Upper (LEL): Not applicable

- Fire Extinguishing Materials: Non – flammable gas mixture. Use extinguishing media appropriate for surrounding fire.
- Unusual Fire and Explosion Hazards: Hydrogen Chloride, can produce severe irritation and health effects at low concentrations; therefore, this gas mixture presents significant health hazards to firefighters. Gas is non-flammable; however, containers, when involved in fire, may rupture or burst in the heat of the fire.
 - Explosion Sensitivity to Mechanical Impact: Not sensitive.
 - Explosion Sensitivity to Static Discharge: Not sensitive.
- Special Fire – Fighting Procedures: Structural firefighters must wear Self – Contained Breathing Apparatus and full protective equipment.

Accidental Release Measures

Leak Response: Due to the small size and content of the cylinder, an accidental release of this product presents significantly less risk of over – exposure to Hydrogen Chloride, the toxic component of this product, and other safety hazards related to the remaining components of this product, than a similar release from a larger cylinder. However, as with any chemical release, extreme caution must be used during emergency response procedures. In the event of a release in which the atmosphere is unknown, and in which other chemicals are potentially involved, evacuate immediately area. Such release should be responded to by trained personnel using pre – planned procedures. Proper protective equipment should be used. In case of a leak, clear the affected area, protect people, and respond with trained personnel. Allow the gas mixture to dissipate. If necessary, monitor the surrounding area (and the original area of the release) for levels of Hydrogen Chloride and Oxygen. The level of Hydrogen Chloride must be above 19.5% oxygen before non-emergency personnel are allowed to re – enter area. If leaking comes from the cylinder, contact your supplier.

Handling and Storage

- **Handling and Storage Precautions**

Use only in well – ventilated areas. Eye wash stations/safety showers should be near areas where this product is used or stored. All work operations should be monitored in such way that emergency personnel can be contacted immediately in the event of a release. Do not attempt to repair, adjust, or in any other way modify cylinders contained with this gas mixture. If there is a malfunction or another type of operational problem, contact nearest distributor immediately.

Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure-reducing regulator when connecting cylinder to lower pressure (<3000 psig) piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous backflow into the system. Protect cylinders from physical damage. Store in cool, dry, well – ventilated area of noncombustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 130°F (54°C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Use a “first in, first out” inventory system to prevent full cylinders being stored for excessive periods of time. There should be no sources of ignition in the storage or use area. Never carry a compressed gas cylinder or a container of a gas in cryogenic liquid form in an enclosed space such as a car trunk, van or station wagon. A leak can result in a fire, asphyxiation or toxic exposure.

Exposure Controls/Personal Protection

Engineering Controls: Hood with forced ventilation. Use local exhaust to prevent accumulation above the exposure limit.

Eye/Face Protection: Safety goggles or glasses.

Skin Protection: Protective gloves of any material.

Other/General Protection: Safety shoes.

Respiratory Protection: No specific respiratory protection is required under normal circumstances of use. Use supplied air respiratory protection if oxygen levels are below 19.5% or unknown during emergency response to a release of this product. If respiratory protection is required for emergency response to this product, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134) or equivalent State standards.

Physical & Chemical Properties

GAS DENSITY @32°F (0°C) and 1 atm: 0.072lbs/ft³ (1.153kg/m³)

BIOLING POINT: -320.4°F (-195.8°C)

FREEZING/MELTING POINT @ 10psig –345.8°F (-210°C)

SPECIFIC GRAVITY (air = 1) @ 70°F (21.1°C): 0.906

SOLUBILITY IN WATER vol./vol. @ 32°F (0°C) and 1 atm: 0.023

EVAPORATING RATE (nBuAc = 1): Not applicable.

ODOR THRESHOLD: 0.06 ppm (Chlorine)

VAPOR PRESSURE @ 70°F (21.1°C) psig: Not applicable.

COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.

pH: Not applicable.

MOLECULAR WEIGHT: 28.01

EXPANSION RATIO: Not applicable

SPECIFIC VOLUME (ft³/lb): 13.8

Appearance and Color: This product is greenish-yellow gas mixture with a pungent odor.

How to Detect this Substance (warning properties): The odor and color of this gas mixture are distinctive warning properties associated with this product.

Stability & Reactivity

- **Stability:** Normally stable in gaseous state.
- **Decomposition Products:** The components of this gas mixture do not decompose, per se, but can react with other compounds in the heat of fire.
- **Incompatible Materials:** Titanium will burn in Nitrogen (a main component of this product). Lithium reacts slowly with Nitrogen at ambient temperatures. Chlorine is not compatible with most metals (except titanium).
- **Hazardous Polymerization:** Will no occur.

- Conditions to Avoid: Contact with incompatible materials. Cylinders exposed to high temperature or direct flame can rupture or burst.

Toxicological Information

Hydrogen Chloride:

Eye Irritant (rabbit)= 100mg,mild reaction
 DNA Repair System (E. coli)= 0.025mg/well
 TCLo (inhalation, human) = 3000ppm/5minutes
 LC50 (inhalation, rat) = 3124ppm/1hour
 LC50 (inhalation, mouse) = 1108ppm/1 hour
 LDLo (human) = 81mg/kg
 LCLo (inhalation, rabbit) = 4416ppm/30minutes
 LD50 (oral-rabbit)= 90mg/kg
 LD50 (intraperitoneal-mouse)= 1449mg/kg

Hydrogen Chloride is severely irritating to contaminated tissue.
 The components of this gas mixture are not known to cause sensitization after prolonged or repeated exposures.
 Treat symptoms, eliminate exposure. Be observant for signs of pulmonary edema.

Ecological Information

HYDROGEN CHLORIDE/HYDROCHLORIC ACID:

LC100 (trout) = 10 mg/l, 24 hours
 LC50(shrimp) = 100-330 ppm, 48 hours (salt water)
 LC50(starfish) = 100-300 mg/L/48 hours
 LC50(cockle) = 330-1000 mg/L/48 hours
 TLM(Gambusia affinis;mosquito fish) = 282 ppm/96 hours (fresh water)
 TLM(Ocean spot) =0.14 mg/L/24 hours;stress
 TLM(Carassium auratus, goldfish) = 178 mg/L/(1-2 hour survival time)

Effects of Materials on Plants or Animals: Due to presence of of Hydrogen Chloride in this gas mixture, animals exposed to this product may be adversely affected.

Effects of Chemicals on Aquatic Life: No evidence is currently available on this product's effects on aquatic life.

Disposal Considerations

Do not attempt to dispose of waste or unused quantities. Return in the shipping container properly labeled, with any valve outlet plugs or caps secure and valve protection cap in place to Precision Gas Products for proper disposal.

Transport Information

Proper Shipping Name:	Compressed gases, n.o.s. (Nitrogen, Hydrogen Chloride)
Hazard Class Number and Description:	2.2 (Non – Flammable Gas)
UN Identification Number:	UN 1956
Packing Group:	Not applicable
CT (DOT) Label(s) Required:	Non – Flammable Gas

Regulatory Information

Hydrogen Chloride = 500 pounds.
 SARA Section 302 (40CFR355.30): Yes
 SARA Section 304 (40CFR355.40): Yes
 SARA Section 313 (40CFR372.65): Yes

This gas mixture is categorized as a Controlled Product, Hazard Class A, as per the Controlled Product Regulations.

Other Information

Information About CT 39 (DOT-39) NRC (Non-Refillable Cylinders) Products

CT 39 (DOT 39) cylinders ship as hazardous materials when full. Once the cylinders are relieved of pressure (empty) they are not considered hazardous material or waste. Residual gas in this type of cylinder is not an issue because toxic gas mixtures are prohibited. Calibration gas mixtures typically packed in these cylinders are Nonflammable n.o.s., UN 1956. A small percentage of calibration gases packed in CT 39 (DOT 39) cylinders are flammable or oxidizing gas mixtures. For disposal of used CT 39 (DOT-39) cylinders, it is acceptable to place them in a landfill if local laws permit. Their disposal is no different than that employed with other CT (DOT) containers such as spray paint cans, household aerosols, or disposable cylinders of propane (for camping, torch etc.). When feasible, we recommended recycling for scrap metal content. Precision Gas Products Inc. will do this for any customer that wishes to return cylinders to us prepaid. All that is required is a phone call to make arrangements so we may anticipate arrival. Scrapping cylinders to valued customers who want to participate.

MIXTURES: When two or more gases or liquefied gases are mixed, their hazardous properties may combine to 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 make your safety evaluation of the end product. Remember gases and liquids have properties, which can cause injury or death.

<p>This Material Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of Precision Gas Products Inc. knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, stability or completeness is not guaranteed and no warranties of any type, either express or implied, are provided. The information contained herein relates only to this specific product. If this product is combined with other materials, all component properties must be considered. Data may be changed from time to time.</p>
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