MATERIAL SAFETY DATA SHEET

Section 1: Product and Company Identification

PortaGas, Inc.
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Product Code: MSDS 2636 (99-0191)

Gas Name	Concentration
Hydrogen Chloride	0.0001 - 0.05%
Nitrogen	BALANCE

	Chemical Substance	Chemical Family	Trade Names
Hydrogen Chloride	HYDROGEN CHLORIDE, ANHYDROUS	halogenated, gas	HYDROCHLORIC ACID, ANHYDROUS; HYDROGEN CHLORIDE; SPIRITS OF SALT; MURIATIC ACID; HYDROCHLORIC ACID; HYDROCHLORIC ACID GAS; ANHYDROUS HYDROCHLORIC ACID; HYDROGEN CHLORIDE (HCl); UN 1050; ClH
Nitrogen	NITROGEN, COMPRESSED GAS	inorganic, gas	DIATOMIC NITROGEN; DINITROGEN; NITROGEN; NITROGEN-14; NITROGEN GAS; UN 1066; N2

Section 2: Hazards Identification

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

US DOT SYMBOLS

CANADA (WHMIS) SYMBOLS

EUROPEAN and (GHS) HAZARD SYMBOLS

Signal Word: **Danger!**

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EU LABELING AND CLASSIFICATION:

Classification of the substance or mixture according to Regulation (EC) No1272/2008

Annex 1 Index #: EC# 231-595-7, 017-002-00-2

Annex 1 Index #: EC# 231-783-9, this substance is not listed in the Annex 1 of Regulation (EC) No 689/2008

Pressurized Gas
Oxidizing Gas Category 1
Eye Irritant Category 2
Skin Irritant Category 2
Aquatic Acute Toxicity Category 1
Acute Toxicity Category 3
Skin Corr. 1A

Hazard Statement(s):

H270: May cause or intensify fire; Oxidizer
H280: Contains gas under pressure, may explode if heated
H315: Causes skin irritation
H319: Causes serious eye irritation
H331: Toxic if inhaled
H400: Very toxic to aquatic life

Precautionary Statement(s):

P220: Keep/store away from combustible materials.
P260: Do not breathe dust/fume/gas/mist/vapors/spray
P281: Use personal protective equipment as required.
P314: Get medical advice/attention if you feel unwell
P403: Store in a well-ventilated place.

Hazard Classification:

[T] Toxic; [Xn] Harmful; [N] Dangerous To the Environment

Risk Phrases:

R23: Toxic by inhalation
R36/37/38: Irritating to eyes, respiratory system, and skin
R50: Very toxic to aquatic organisms.

Safety Phrases:

S9: Keep in well-ventilated area
S45: In case of an emergency or if you feel unwell, seek medical advice immediately
S61: Avoid release to the environment

HEALTH HAZARDS OR RISKS FROM EXPOSURE

ACUTE: This clear, pungent-smelling, colorless gas mixture is severely irritating to the eyes, respiratory system, and skin. Prolonged exposures may damage contaminated skin and eyes, as well as cause damage to the tissues of the respiratory system. Inhalation of high concentrations of this gas mixture may be fatal, due to Chlorine overexposure and asphyxiation.

CHRONIC: Dermatitis may result from repeated skin contact with this gas mixture. Repeated overexposures by inhalation can result in emphysema and erosion of tooth enamel. Refer to Section 11 (Toxicological Information) for additional information.

TARGET ORGANS: ACUTE: Respiratory system, skin, eyes, and teeth. CHRONIC: None known

	Description	Main Health Hazard
Hydrogen Chloride	Colorless, irritating odor Containers may rupture or explode if exposed to heat. May react on contact with water.	Respiratory tract burns, skin burns, eye burns, mucous membrane burns. The gas absorbs moisture from the air and can form an acid fog in damp air.
Nitrogen	Colorless, odorless Containers may rupture or explode if exposed to heat.	Difficulty breathing

Likely Routes of Exposure:

	Inhalation	Ingestion	Eye	Skin	Health Effects	Target Organs	Medical Condition Aggravated by -
Hydrogen Chloride	Burns	Burns	Burns	Burns	Respiratory tract burns, skin burns, eye burns, mucous membrane burns. The gas absorbs moisture from the air and can form an acid fog in damp air.	Lungs, upper respiratory tract, skin, eyes	Pre-existing conditions of lungs, upper respiratory tract, skin, eyes.

	Inhalation	Ingestion	Eye	Skin	Health Effects	Target Organs	Medical Condition Aggravated by -
Nitrogen	Nausea, vomiting, difficulty breathing, headache, drowsiness, dizziness, tingling sensation, loss of coordination, convulsions, coma	Ingestion of a gas is unlikely	Contact with rapidly expanding gas may cause burns or frostbite	No information on significant adverse effects	Difficulty breathing	Respiratory system	Pre-existing conditions of respiratory system.

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Section 3: Composition/Information on Ingredients

	CAS #	EC #	% by Volume
Hydrogen Chloride	7647-01-0	231-595-7	0.0001 - 0.05%
Nitrogen	7727-37-9	231-783-9	BALANCE

Section 4: First Aid Measures

	Skin Contact	Eye Contact	Ingestion	Inhalation	Note to Physicians
Hydrogen Chloride	Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention. Thoroughly clean and dry contaminated clothing before reuse. Destroy contaminated shoes.	Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.	Contact local poison control center or physician immediately. Never make an unconscious person vomit or drink fluids. Give large amounts of water or milk. Allow vomiting to occur. When vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.	If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention. Avoid mouth-to-mouth contact by using mouth guards or shields.	For inhalation, consider oxygen. Avoid gastric lavage or emesis.
Nitrogen	Wash exposed skin with soap and water.	Flush eyes with plenty of water.	If a large amount is swallowed, get medical attention.	If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.	For inhalation, consider oxygen.

Section 5: Fire Fighting Measures

	Suitable Extinguishing Media	Products of Combustion	Protection of Firefighters
Hydrogen Chloride	Hydrogen chloride does not burn. Use extinguishing agents compatible with hydrogen chloride and appropriate for the surrounding fire.	Decomposes under intense fire conditions to form extremely flammable and potentially explosive hydrogen gas and very toxic and corrosive chlorine gas.	▪ Any self-contained breathing apparatus with a full facepiece. ▪ Any self-contained breathing apparatus with a full facepiece.
Nitrogen	Non-flammable. Use suitable extinguishing media for surrounding fire. Cylinders may rupture or explode if exposed to heat.	Non-flammable	▪ Respiratory protection may be needed for frequent or heavy exposure.

Section 6: Accidental Release Measures

	Personal Precautions	Environmental Precautions	Methods for Containment
Hydrogen Chloride	Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas. Ventilate closed spaces before entering. Evacuation radius: 150 feet.	Prevent contamination of the surrounding environment.	Stop leak if possible without personal risk. Reduce vapors with water spray. Do not get water directly on material. Do not get water inside container. Dig holding area such as lagoon, pond or pit for containment.
Nitrogen	Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas.	No significant effects from contamination expected.	Stop leak if possible without personal risk.

	Methods for Cleanup	Other Information
Hydrogen Chloride	Small spills: Flood with water. Large spills: Dike for later disposal. Collect runoff for disposal as potential hazardous waste. Absorb with sand or other non-combustible material. Add an alkaline material (lime, crushed limestone, sodium bicarbonate, or soda ash).	Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).
Nitrogen	N/A	N/A

Section 7: Handling and Storage

	Handling	Storage
Hydrogen Chloride	Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. Protect from physical damage. Store in a cool, dry place. Store in a well-ventilated area. Notify State Emergency Response Commission for storage or use at amounts greater than or equal to the TPQ (U.S. EPA SARA Section 302). SARA Section 303 requires facilities storing a material with a TPQ to participate in local emergency response planning (U.S. EPA 40 CFR 355.30).	Keep separated from incompatible substances.
Nitrogen	Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101.	Keep separated from incompatible substances.

Section 8: Exposure Controls/Personal Protection

	Exposure Guidelines
Hydrogen Chloride	HYDROGEN CHLORIDE, ANHYDROUS: HYDROGEN CHLORIDE (HYDROCHLORIC ACID): 5 ppm (7 mg/m3) OSHA ceiling 2 ppm ACGIH ceiling 5 ppm (7 mg/m3) NIOSH recommended ceiling
Nitrogen	NITROGEN, COMPRESSED GAS: NITROGEN: ACGIH (simple asphyxiant)

Engineering Controls

Handle only in fully enclosed systems.

	Eye Protection	Skin Protection	Respiratory Protection
Hydrogen Chloride	Wear splash resistant safety goggles with a face shield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.	Wear appropriate chemical resistant clothing.	Any self-contained breathing apparatus with a full facepiece.
Nitrogen	Eye protection not required, but recommended.	Protective clothing is not required.	Respiratory protection may be needed for frequent or heavy exposure.

General Hygiene considerations

- Avoid breathing vapor or mist
- Avoid contact with eyes and skin
- Wash thoroughly after handling and before eating or drinking

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Section 9: Physical and Chemical Properties

	Physical State	Appearance	Color	Change in Appearance	Physical Form	Odor	Taste
Hydrogen Chloride	Gas	Colorless	Colorless	N/A	Gas	Irritating odor	N/A
Nitrogen	Gas	Clear	Colorless	N/A	Gas	Odorless	Tasteless

	Flash Point	Flammability	Partition Coefficient	Autoignition Temperature	Upper Explosive Limits	Lower Explosive Limits
Hydrogen Chloride	Non-flammable gas (does not burn).	Not available	Not available	Nonflammable	Nonflammable	Nonflammable
Nitrogen	Not flammable	Not available	Not available	Nonflammable	Nonflammable	Nonflammable

	Boiling Point	Freezing Point	Vapor Pressure	Vapor Density	Specific Gravity	Water Solubility	pH	Odor Threshold	Evaporation Rate	Viscosity
Hydrogen Chloride	-121 F (-85 C)	-175 F (-115 C)	30400 mmHg @ 17.8 C	1.268	1.187 @ -85 C	82.3% @ 0 C	Acidic in solution	1-5 ppm	Not applicable	Not available
Nitrogen	-321 F (-196 C)	-346 F (-210 C)	760 mmHg @ -196 C	0.967	Not applicable	1.6% @ 20 C	Not applicable	Not available	Not applicable	0.01787 cP @ 27 C

	Molecular Weight	Molecular Formula	Density	Weight per Gallon	Volatility by Volume	Volatility	Solvent Solubility
Hydrogen Chloride	36.46	H-Cl	0.095 lb/ft3	Not available	100%	Not applicable	Soluble: Alcohol, ether, benzene, methanol
Nitrogen	28.0134	N2	1.2506 g/L	Not available	100%	1	Soluble: Liquid ammonia

Section 10: Stability and Reactivity

	Stability	Conditions to Avoid	Incompatible Materials
Hydrogen Chloride	May react with evolution of heat on contact with water.	May react with evolution of heat on contact with water.	Cyanides, metals, amines, bases, metal carbide, oxidizing materials, acids, halo carbons, combustible materials, halogens, metal salts, formaldehyde, fluorine, alcohols
Nitrogen	Stable at normal temperatures and pressure.	Stable at normal temperatures and pressure.	Metals, oxidizing materials

	Hazardous Decomposition Products	Possibility of Hazardous Reactions
Hydrogen Chloride	Chlorine	Will not polymerize.
Nitrogen	Oxides of nitrogen	Will not polymerize.

Section 11: Toxicology Information

Acute Effects

	Oral LD50	Dermal LD50	Inhalation
Hydrogen Chloride	900 mg/kg oral-rabbit LD50	Not available	Burns
Nitrogen	Not available	Not available	Nausea, vomiting, difficulty breathing, headache, drowsiness, dizziness, tingling sensation, loss of coordination, convulsions, coma

	Eye Irritation	Skin Irritation	Sensitization
Hydrogen Chloride	Burns	Burns	Respiratory tract burns, skin burns, eye burns, mucous membrane burns. The gas absorbs moisture from the air and can form an acid fog in damp air.

	Eye Irritation	Skin Irritation	Sensitization
Nitrogen	Contact with rapidly expanding gas may cause burns or frostbite	No information on significant adverse effects	Difficulty breathing

Chronic Effects

	Carcinogenicity	Mutagenicity	Reproductive Effects	Developmental Effects
Hydrogen Chloride	IARC: Human Inadequate Evidence, Animal Inadequate Evidence, Group 3; ACGIH: A4 -Not Classifiable as a Human Carcinogen	Available.	Available.	No data
Nitrogen	Not hazardous	Not available	Not available	No data

Section 12: Ecological Information

Fate and Transport

	Eco toxicity	Persistence / Degradability	Bioaccumulation / Accumulation	Mobility in Environment
Hydrogen Chloride	Fish toxicity: Acute LC50 282000 ug/L Fresh water Fish - Western mosquitofish - Gambusia affinis - Adult 96 hours; 21900 ug/L 96 hour(s) LC50 (Mortality) Fathead min Invertibrate toxicity: 560 ug/L 48 hour(s) EC50 (Immobilization) Water flea (Daphnia magna) Algal toxicity: 800 ug/L 1600 week(s) EC50 (Population Size Reduction) Green algae (Chlorella pyrenoidosa) Phyto toxicity: 1000 ug/L 4-48 week(s) (Residue) Water-hyacinth (Eichhornia crassipes) Other toxicity: Not available	Not available	Not available	Not available
Nitrogen	Fish toxicity: Not available Invertibrate toxicity: Not available Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available	Not available	Not available	Not available

Section 13: Disposal Considerations

Hydrogen Chloride	Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D002. Dispose in accordance with all applicable regulations.
Nitrogen	Dispose in accordance with all applicable regulations.

Section 14: Transportation Information

US DOT; IATA; IMO; ADR:

THIS GAS MIXTURE IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME: Compressed gases, n.o.s. (*Oxygen, Nitrogen)*or the gas component with the next highest concentration next to Nitrogen.

HAZARD CLASS NUMBER and DESCRIPTION: 2.2 (Non-Flammable Gas)

UN IDENTIFICATION NUMBER: UN 1956

PACKING GROUP: Not applicable.

DOT LABEL(S) REQUIRED: Class 2.2 (Non-Flammable Gas)

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 126

MARINE POLLUTANT: The components of this gas mixture are not classified by the DOT as Marine Pollutants (as defined by 49 CFR 172.101, Appendix B).

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards. If transporting these cylinders in vehicles, ensure these cylinders are not exposed to extremely high temperatures (as may occur in an enclosed vehicle on a hot day). Additionally, the vehicle should be well-ventilated during transportation.

Note: DOT 39 Cylinders ship in a strong outer carton (overpack). Pertinent shipping information goes on the outside of the overpack. DOT 39 Cylinders do not have transportation information on the cylinder itself.

U.S. DEPARTMENT OF TRANSPORTATION (DOT) SHIPPING REGULATIONS:

This product is classified as dangerous goods, per U.S. DOT regulations, under 49 CFR 172.101.

TRANSPORT CANADA, TRANSPORTATION OF DANGEROUS GOODS REGULATIONS:

This product is classified as Dangerous Goods, per regulations of Transport Canada.

PROPER SHIPPING NAME:	Compressed gases, n.o.s. (*Oxygen, Nitrogen)*or the gas component with the next highest concentration next to Nitrogen.
HAZARD CLASS NUMBER and DESCRIPTION:	2.2 (Non-Flammable Gas)
UN IDENTIFICATION NUMBER:	UN 1956
PACKING GROUP:	Not Applicable
HAZARD LABEL:	Class 2.2 (Non-Flammable Gas)
SPECIAL PROVISIONS:	None
EXPLOSIVE LIMIT AND LIMITED QUANTITY INDEX:	0.12
ERAP INDEX:	3000
PASSENGER CARRYING SHIP INDEX:	Forbidden

PASSENGER CARRYING ROAD VEHICLE OR PASSENGER CARRYING RAILWAY VEHICLE INDEX: Forbidden
NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2004): 126

Note: Shipment of compressed gas cylinders via Public Passenger Road Vehicle is a violation of Canadian law (Transport Canada Transportation of Dangerous Goods Act, 1992).

INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA):

This product is classified as Dangerous Goods, by rules of IATA:

INTERNATIONAL MARITIME ORGANIZATION (IMO) DESIGNATION:

This product is classified as Dangerous Goods by the International Maritime Organization.

EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR):

This product is classified by the United Nations Economic Commission for Europe to be dangerous goods.

U.S. DOT 49 CFR 172.101

	Proper Shipping Name	ID Number	Hazard Class or Division	Packing Group	Labeling Requirements	Passenger Aircraft or Railcar Quantity Limitations	Cargo Aircraft Only Quantity Limitations	Additional Shipping Description
Hydrogen Chloride	Hydrogen chloride, anhydrous	UN1050	2.3	Not applicable	2.3; 8	Forbidden	Forbidden	Toxic-Inhalation Hazard Zone C
Nitrogen	Nitrogen, compressed	UN1066	2.2	Not applicable	2.2	75 kg or L	150 kg	N/A

Canadian Transportation of Dangerous Goods

	Shipping Name	UN Number	Class	Packing Group / Risk Group
Hydrogen Chloride	Hydrogen chloride, anhydrous	UN1050	2.3; 8	Not applicable
Nitrogen	Nitrogen, compressed	UN1066	2.2	Not applicable

Section 15: Regulatory Information

U.S. Regulations

	CERCLA Sections	SARA 355.30	SARA 355.40
Hydrogen Chloride	5000 LBS RQ (liquid)	500 LBS TPQ (gas)	5000 LBS RQ (gas)
Nitrogen	Not regulated.	Not regulated.	Not regulated.

SARA 370.21

	Acute	Chronic	Fire	Reactive	Sudden Release

Hydrogen Chloride	Yes	No	No	Yes	Yes
Nitrogen	Yes	No	No	No	Yes

SARA 372.65

Hydrogen Chloride	HYDROGEN CHLORIDE (HYDROCHLORIC ACID): except non-aerosol forms
Nitrogen	Not regulated.

OSHA Process Safety

Hydrogen Chloride	5000 LBS TQ (gas)
Nitrogen	Not regulated.

State Regulations

	CA Proposition 65
Hydrogen Chloride	Not regulated.
Nitrogen	Not regulated.

Canadian Regulations

	WHMIS Classification
Hydrogen Chloride	A, D1A, E
Nitrogen	A

National Inventory Status

	US Inventory (TSCA)	**TSCA 12b Export Notification**	**Canada Inventory (DSL/NDSL)**
Hydrogen Chloride	Listed on inventory.	Not listed.	Not determined.
Nitrogen	Listed on inventory.	Not listed.	Listed on inventory.

Section 16: Other Information

	NFPA Rating
Hydrogen Chloride	HEALTH=3 FIRE=0 REACTIVITY=1
Nitrogen	HEALTH=1 FIRE=0 REACTIVITY=0

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard