SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
Product form : Mixture
Product name : Hydrogen Chloride (0.0001% - 0.02%) in Nitrogen

1.2. Relevant identified uses of the substance or mixture and uses advised against
Use of the substance/mixture : Test gas/Calibration gas.

1.3. Details of the supplier of the safety data sheet
Calgaz, division of Air Liquide
821 Chesapeake Drive
Cambridge, 21613 - USA
T 1-410-228-6400 - F 1-410-228-4251
info@Calgaz.com - www.Calgaz.com

1.4. Emergency telephone number
Emergency number : CHEMTREC: 1-800-424-9300
Internationally: 1-703-527-3887

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture
Classification (GHS-US)
Compressed gas H280
Full text of H-phrases: see section 16

2.2. Label elements

GHS-US labeling
Hazard pictograms (GHS-US) :

GHS04

Signal word (GHS-US) : Warning
Hazard statements (GHS-US) : H280 - Contains gas under pressure; may explode if heated
Precautionary statements (GHS-US) :
P202 - Do not handle until all safety precautions have been read and understood
P271 - Use only outdoors or in a well-ventilated area
P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing
P313 - Get medical advice/attention
P403 - Store in a well-ventilated place
CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F)
CGA-PG05 - Use a back flow preventive device in the piping
CGA-PG06 - Close valve after each use and when empty
CGA-PG10 - Use only with equipment rated for cylinder pressure
CGA-PG14 - Approach suspected leak area with caution
CGA-PG21 - Open valve slowly

2.3. Other hazards
No additional information available

2.4. Unknown acute toxicity (GHS-US)
Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substance
Not applicable

3.2. Mixture
Not applicable
SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If you feel unwell, seek medical advice.

First-aid measures after skin contact: Adverse effects not expected from this product. If skin irritation or rash occurs: Get medical advice/attention.

First-aid measures after eye contact: Adverse effects not expected from this product. If eye irritation develops, seek medical attention.

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

Symptoms/injuries after inhalation: May displace oxygen and cause rapid suffocation.

Symptoms/injuries after skin contact: Adverse effects not expected from this product.

Symptoms/injuries after eye contact: Adverse effects not expected from this product.

Symptoms/injuries after ingestion: Ingestion is not considered a potential route of exposure.

Chronic symptoms: Adverse effects not expected from this product.

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

If you feel unwell, seek medical advice. If breathing is difficult, give oxygen.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: Use extinguishing media appropriate for surrounding fire.

Unsuitable extinguishing media: Do not use water jet.

5.2. Special hazards arising from the substance or mixture

Fire hazard: The product is not flammable.

Explosion hazard: Product is not explosive. Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries.

Reactivity: None known. Reacts with water to form corrosive acids. Corrosive vapors.

5.3. Advice for firefighters

Firefighting instructions: In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion. Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire.

Protection during firefighting: Standard protective clothing and equipment (e.g., Self Contained Breathing Apparatus) for fire fighters. Do not enter fire area without proper protective equipment, including respiratory protection.

Specific methods: Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems. Exposure to fire may cause containers to rupture/explode. Continue water spray from protected position until container stays cool. Move containers away from the fire area if this can be done without risk.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures: Ensure adequate ventilation.

6.1.1. For non-emergency personnel

Protective equipment: Wear protective equipment consistent with the site emergency plan.

6.1.2. For emergency responders

Protective equipment: Standard protective clothing and equipment (e.g., Self Contained Breathing Apparatus) for fire fighters. Equip cleanup crew with proper protection.

Emergency procedures: Evacuate and limit access. Ventilate area.

6.2. Environmental precautions

Try to stop release if safe to do so.

6.3. Methods and material for containment and cleaning up

For containment: Try to stop release if safe to do so.

Methods for cleaning up: Dispose of this material and its container in accordance with local regulations.

6.4. Reference to other sections

See also Sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed: Pressurized container: Do not pierce or burn, even after use. Do not pierce or burn, even after use. Use equipment rated for cylinder pressure.

Precautions for safe handling: Do not handle until all safety precautions have been read and understood. Use only outdoors or in a well-ventilated area.

Safe handling of the gas receptacle: Protect cylinders from physical damage; do not drag, roll, slide or drop. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents.

Safe use of the product: The substance must be handled in accordance with good industrial hygiene and safety procedures. Only experienced and properly instructed persons should handle gases under pressure. Consider pressure relief device(s) in gas installations. Ensure the complete gas system was (or is regularly) checked for leaks before use. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.

Hygiene measures: Do not eat, drink or smoke when using this product.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures: Comply with applicable regulations.

Storage conditions: Do not expose to temperatures exceeding 52°C (125°F). Keep container closed when not in use. Protect cylinder from physical damage. Store in well ventilated area.

Incompatible products: None known.


Storage area: Store away from heat. Store in a well-ventilated place.

7.3. Specific end use(s)

See Section 1.2.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

<table>
<thead>
<tr>
<th>Hydrogen Chloride (0.0001% - 0.02%) in Nitrogen</th>
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<tbody>
<tr>
<td>ACGIH</td>
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<td>OSHA</td>
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<tr>
<th>Nitrogen (7727-37-9)</th>
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<tbody>
<tr>
<td>ACGIH</td>
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<td>OSHA</td>
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<table>
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<tr>
<th>Hydrogen chloride (7647-01-0)</th>
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<tbody>
<tr>
<td>ACGIH</td>
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<tr>
<td>OSHA</td>
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<tr>
<td>OSHA</td>
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</tbody>
</table>
8.2. Exposure controls

Appropriate engineering controls: Provide adequate general and local exhaust ventilation. Oxygen detectors should be used when asphyxiating gases may be released. Systems under pressure should be regularly checked for leakages. Consider work permit system e.g. for maintenance activities. Ensure exposure is below occupational exposure limits.


Skin and body protection: Wear suitable protective clothing, e.g. lab coats, coveralls or flame resistant clothing.

Respiratory protection: None necessary during normal and routine operations. See Sections 5 & 6.

Thermal hazard protection: None necessary during normal and routine operations.

Environmental exposure controls: Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.


SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state: Gas

Appearance: Clear, colorless gas.

Molecular mass: Not applicable for gas-mixtures.

Color: Colorless

Odor: Irritating/pungent odour; Odorless

Odor threshold: No data available

pH: Not applicable for gas-mixtures.

Relative evaporation rate (butyl acetate=1): No data available

Relative evaporation rate (ether=1): Not applicable for gas-mixtures.

Melting point: No data available

Freezing point: No data available

Boiling point: No data available

Flash point: No data available

Auto-ignition temperature: No data available

Decomposition temperature: No data available

Flammability (solid, gas): See Sect. 2.1 & 2.2

Vapor pressure: Not applicable.

Relative vapor density at 20 °C: No data available

Relative density: No data available

Relative gas density: Lighter or similar to air.

Solubility: Water: Solubility in water of component(s) of the mixture:

• : 720000 mg/l
• : 20 mg/l

Log Pow: Not applicable for gas-mixtures.

Log Kow: Not applicable for gas-mixtures.

Viscosity, kinematic: Not applicable.

Viscosity, dynamic: Not applicable.

Explosive properties: Not applicable - not flammable.

Oxidizing properties: None.

Explosive limits: Not applicable - not flammable

9.2. Other information

Additional information: None.

SECTION 10: Stability and reactivity

10.1. Reactivity

None known. Reacts with water to form corrosive acids. Corrosive vapors.

10.2. Chemical stability

Stable under normal conditions.
10.3. Possibility of hazardous reactions
None known. May react violently with reducing agents.

10.4. Conditions to avoid
None under recommended storage and handling conditions (see section 7). Moisture.

10.5. Incompatible materials
None known.

10.6. Hazardous decomposition products
Under normal conditions of storage and use hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

<table>
<thead>
<tr>
<th>Substance</th>
<th>Acute toxicity</th>
<th>Skin corrosion/irritation</th>
<th>Respiratory or skin sensitization</th>
<th>Reproductive toxicity</th>
<th>Specific target organ toxicity (single exposure)</th>
<th>Specific target organ toxicity (repeated exposure)</th>
<th>Aspiration hazard</th>
<th>Symptoms/injuries after inhalation</th>
<th>Symptoms/injuries after skin contact</th>
<th>Symptoms/injuries after eye contact</th>
<th>Symptoms/injuries after ingestion</th>
<th>Symptoms/injuries upon intravenous administration</th>
<th>Chronic symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen (7727-37-9)</td>
<td>Not classified</td>
<td>Not classified</td>
<td>Not classified</td>
<td>Not classified</td>
<td>Not classified</td>
<td>Not classified</td>
<td></td>
<td>Adverse effects not expected from this product.</td>
<td>Adverse effects not expected from this product.</td>
<td>Adverse effects not expected from this product.</td>
<td>Ingestion is not considered a potential route of exposure.</td>
<td>Adverse effects not expected from this product.</td>
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<td>Hydrogen chloride (7647-01-0)</td>
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<td>LC50 inhalation rat (ppm)</td>
<td>820000 ppm/4h</td>
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<tr>
<td>LD50 oral rat</td>
<td>700 mg/kg</td>
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<tr>
<td>LD50 dermal rabbit</td>
<td>&gt; 5010 mg/kg</td>
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<tr>
<td>LC50 inhalation rat (ppm)</td>
<td>1560 ppm/4h</td>
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<tr>
<td>ATE US (gases)</td>
<td>700.000 ppmV/4h</td>
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</tbody>
</table>

12.1. Toxicity
Ecology - general: Classification criteria are not met.

12.2. Persistence and degradability

<table>
<thead>
<tr>
<th>Substance</th>
<th>Persistence and degradability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen Chloride (0.0001% - 0.02%) in Nitrogen</td>
<td>No data available.</td>
</tr>
<tr>
<td>Nitrogen (7727-37-9)</td>
<td>No ecological damage caused by this product.</td>
</tr>
</tbody>
</table>
Hydrogen Chloride (0.0001% - 0.02%) in Nitrogen

Persistence and degradability
Not applicable for inorganic gases.

12.3. Bioaccumulative potential

Hydrogen Chloride (0.0001% - 0.02%) in Nitrogen

Log Pow
Not applicable for gas-mixtures.

Log Kow
Not applicable for gas-mixtures.

Bioaccumulative potential
No data available.

Nitrogen (7727-37-9)

Log Pow
Not applicable for inorganic gases.

Bioaccumulative potential
No ecological damage caused by this product.

Hydrogen chloride (7647-01-0)

Log Pow
Not applicable for inorganic gases.

Bioaccumulative potential
No data available.

12.4. Mobility in soil

Hydrogen Chloride (0.0001% - 0.02%) in Nitrogen

Mobility in soil
No data available.

Nitrogen (7727-37-9)

Ecology - soil
No ecological damage caused by this product.

Hydrogen chloride (7647-01-0)

Ecology - soil
Because of its high volatility, the product is unlikely to cause ground or water pollution.

12.5. Other adverse effects

Effect on ozone layer
None.

Effect on the global warming
No known ecological damage caused by this product.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods
Contact supplier if guidance is required. Do not discharge into any place where its accumulation could be dangerous. Ensure that the emission levels from local regulations or operating permits are not exceeded.

Waste disposal recommendations
Refer to the CGA Pamphlet P-63 "Disposal of Gases" available at www.cganet.com for more guidance on suitable disposal methods.

SECTION 14: Transport information

In accordance with DOT

Transport document description
UN1956 Compressed gas, n.o.s. (Nitrogen, Hydrogen Chloride)

UN-No.(DOT)
UN1956

Proper Shipping Name (DOT)
Compressed gas, n.o.s.

Hazard labels (DOT)
2.2 - Non-flammable gas

DOT Symbols
G - Identifies PSN requiring a technical name

DOT Packaging Exceptions (49 CFR 173.xxx)
306,307

DOT Packaging Non Bulk (49 CFR 173.xxx)
302,305

DOT Packaging Bulk (49 CFR 173.xxx)
314,315

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)
75 kg

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)
150 kg

DOT Vessel Stowage Location
A - The material may be stowed “on deck” or “under deck” on a cargo vessel and on a passenger vessel.
Hydrogen Chloride (0.0001% - 0.02%) in Nitrogen

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

<table>
<thead>
<tr>
<th>Additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other information</td>
</tr>
<tr>
<td>Special transport precautions</td>
</tr>
</tbody>
</table>

**ADR**

Transport document description: UN 1956 COMPRESSED GAS, N.O.S., 2.2

Class (ADR): 2 - Gases

Hazard labels (ADR): 2.2 - Non-flammable compressed gas

**Transport by sea**

UN-No. (IMDG): 1956

Proper Shipping Name (IMDG): COMPRESSED GAS, N.O.S.

Class (IMDG): 2.2 - Non-flammable, non-toxic gases

**Air transport**

UN-No.(IATA): 1956

Proper Shipping Name (IATA): COMPRESSED GAS, N.O.S.

Class (IATA): 2

**SECTION 15: Regulatory information**

**15.1. US Federal regulations**

Nitrogen (7727-37-9)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Hydrogen chloride (7647-01-0)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Listed on the United States SARA Section 302

Listed on United States SARA Section 313

SARA Section 302 Threshold Planning Quantity (TPQ): 500 (gas only)

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**

Nitrogen (7727-37-9)

Listed on the Canadian DSL (Domestic Sustances List)

WHMIS Classification: Class A - Compressed Gas

Hydrogen chloride (7647-01-0)

Listed on the Canadian DSL (Domestic Sustances List)

WHMIS Classification: Class A - Compressed Gas

Class D Division 1 Subdivision A - Very toxic material causing immediate and serious toxic effects

Class E - Corrosive Material

**EU-Regulations**

Nitrogen (7727-37-9)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
Hydrogen Chloride (0.0001% - 0.02%) in Nitrogen

Safety Data Sheet

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Hydrogen chloride (7647-01-0)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

Classification according to Regulation (EC) No. 1272/2008 [CLP]
Not classified

Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]

15.2. National regulations

Nitrogen (7727-37-9)
Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IEESC (Inventory of Existing Chemical Substances Produced or Imported in China)
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)

Hydrogen chloride (7647-01-0)
Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IEESC (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

15.3. US State regulations

Nitrogen (7727-37-9)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

Hydrogen chloride (7647-01-0)
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

Indication of changes: Revised safety data sheet in accordance with OSHA final rule on GHS implementation promulgated March 26, 2012.

Other information: This 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.

Full text of H-phrases:

| Acute Tox. 3 (Inhalation:gas) | Acute toxicity (inhalation:gas) Category 3 |
| Compressed gas | Gases under pressure Compressed gas |
| Eye Dam. 1 | Serious eye damage/eye irritation Category 1 |
| Liquefied gas | Gases under pressure Liquefied gas |
| Skin Corr. 1A | Skin corrosion/irritation Category 1A |
| H280 | Contains gas under pressure; may explode if heated |
| H314 | Causes severe skin burns and eye damage |
| H318 | Causes serious eye damage |
| H331 | Toxic if inhaled |

SDS US (GHS HazCom 2012)

This 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 gas mixture. To the best of Calgaz’s knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are 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 gas mixture is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.