

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

1.1. Product identifier

Product form : Mixture
 Product name : Chlorine (0.0001 % - 0.04%) 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

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
 CGA-PG05 - Use a back flow preventive device in the piping
 CGA-PG21 - Open valve slowly
 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-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F)
 P403 - Store in a well-ventilated place

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS-US)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

| Name | Product identifier | % | Classification (GHS-US) |
|----------|--------------------|-----------------|-------------------------|
| Nitrogen | (CAS No) 7727-37-9 | 99.96 - 99.9999 | Compressed gas, H280 |

Chlorine (0.0001 % - 0.04%) in Nitrogen

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| Name | Product identifier | % | Classification (GHS-US) |
|----------|--------------------|---------------|---|
| Chlorine | (CAS No) 7782-50-5 | 0.0001 - 0.04 | Liquefied gas, H280 Acute Tox. 2 (Inhalation:gas), H330 |

SECTION 4: First aid measures

4.1. Description of first aid measures

- First-aid measures after inhalation : Remove 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.
- First-aid measures after eye contact : Adverse effects not expected from this product.
- 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 : Symptoms similar to those listed under inhalation.
- 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.
- Symptoms/injuries upon intravenous administration : Not known.
- 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 : 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.

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.
- Emergency procedures : Escape the danger area by the closest safe route. Close doors and windows of adjacent premises. Keep containers closed. Mark the danger area. Seal off low-lying areas. Keep upwind.

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.

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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. Carefully collect the spill/leftovers. Clean contaminated surfaces with an excess of water. Scoop absorbed substance into closing containers.

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. 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 : Only experienced and properly instructed persons should handle gases under pressure. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents.
- 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.
- Incompatible materials : Bases or caustic materials. Reducing agents.

7.3. Specific end use(s)

Test gas/Calibration gas.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Nitrogen (7727-37-9)

Chlorine (7782-50-5)

| | | |
|-----------|---|---------------------|
| USA ACGIH | ACGIH TWA (ppm) | 0.5 ppm |
| USA ACGIH | ACGIH STEL (ppm) | 1 ppm |
| USA OSHA | OSHA PEL (Ceiling) (mg/m ³) | 3 mg/m ³ |
| USA OSHA | OSHA PEL (Ceiling) (ppm) | 1 ppm |

8.2. Exposure controls

- Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Systems under pressure should be regularly checked for leakages. Ensure exposure is below occupational exposure limits. Alarm detectors should be used when toxic gases may be released. Consider work permit system e.g. for maintenance activities.
- Hand protection : Wear working gloves when handling gas containers. 29CFR 1910.138: Hand Protection.
- Eye protection : Wear safety glasses with side shields. 29 CFR 1910.133: Eye and Face Protection.
- 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.
- Other information : Wear safety shoes while handling containers. 29 CFR 1910.136: Foot Protection.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

- Physical state : Gas
- Appearance : colorless to slightly yellow. Gas.

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| | |
|---|--|
| Molecular mass | : Not applicable for gas-mixtures. |
| Color | : colorless to slightly yellow |
| Odor | : Pungent |
| 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) | : Not applicable - not flammable |
| 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 : •: 20 mg/l •: 8620 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

Reacts with water to form corrosive acids. Corrosive vapors.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

May react violently with reducing agents.

10.4. Conditions to avoid

Moisture.

10.5. Incompatible materials

Reducing agents. Bases or caustic materials.

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

Acute toxicity : Not classified

| | |
|-----------------------------|--------------------------------|
| Nitrogen (7727-37-9) | |
| LC50 inhalation rat (ppm) | 410000 ppm/4h |
| Chlorine (7782-50-5) | |
| LC50 inhalation rat (mg/l) | 0.86 mg/l (Exposure time: 1 h) |

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| Chlorine (7782-50-5) | |
|---------------------------|----------------------|
| LC50 inhalation rat (ppm) | 146.5 ppm/4h |
| ATE US (gases) | 146.50000000 ppmV/4h |
| ATE US (vapors) | 0.86000000 mg/l/4h |
| ATE US (dust, mist) | 0.86000000 mg/l/4h |

| | |
|--|--|
| Skin corrosion/irritation | : Not classified pH: Not applicable for gas-mixtures. |
| Serious eye damage/irritation | : Not classified pH: Not applicable for gas-mixtures. |
| Respiratory or skin sensitization | : Not classified |
| Germ cell mutagenicity | : Not classified |
| Carcinogenicity | : Not classified |
| Reproductive toxicity | : Not classified |
| Specific target organ toxicity (single exposure) | : Not classified |
| Specific target organ toxicity (repeated exposure) | : Not classified No known effects from this product. |
| Aspiration hazard | : Not classified Not applicable for gases and gas-mixtures. |
| 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. |
| Symptoms/injuries upon intravenous administration | : Not known. |
| Chronic symptoms | : Adverse effects not expected from this product. |

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : Classification criteria are not met.

| Chlorine (7782-50-5) | |
|----------------------|--|
| LC50 fish 1 | 0.44 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [flow-through]) |
| EC50 Daphnia 1 | 0.017 mg/l (Exposure time: 48 h - Species: Daphnia magna) |
| LC50 fish 2 | 0.014 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [flow-through]) |

12.2. Persistence and degradability

| Chlorine (0.0001 % - 0.04%) in Nitrogen | |
|---|--------------------|
| Persistence and degradability | No data available. |

| Nitrogen (7727-37-9) | |
|-------------------------------|--|
| Persistence and degradability | No ecological damage caused by this product. |

| Chlorine (7782-50-5) | |
|-------------------------------|-------------------------------------|
| Persistence and degradability | Not applicable for inorganic gases. |

12.3. Bioaccumulative potential

| Chlorine (0.0001 % - 0.04%) 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. |

| Chlorine (7782-50-5) | |
|----------------------|-------------------------------|
| BCF fish 1 | (no bioaccumulation expected) |

Chlorine (0.0001 % - 0.04%) in Nitrogen

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| Chlorine (7782-50-5) | |
|---------------------------|-------------------------------------|
| Log Pow | Not applicable for inorganic gases. |
| Bioaccumulative potential | No data available. |

12.4. Mobility in soil

| Chlorine (0.0001 % - 0.04%) in Nitrogen | |
|---|--------------------|
| Mobility in soil | No data available. |

| Nitrogen (7727-37-9) | |
|----------------------|--|
| Ecology - soil | No ecological damage caused by this product. |

| Chlorine (7782-50-5) | |
|----------------------|---|
| 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. |
| Effect on the global warming | : No known effects from 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. Must not be discharged to atmosphere. Gas may be scrubbed in alkaline solution under controlled conditions to avoid violent reaction. 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, Chlorine) |
| UN-No.(DOT) | : 1956 |
| DOT NA no. | : UN1956 |
| DOT Proper Shipping Name | : Compressed gas, n.o.s. (Nitrogen, Chlorine) |
| 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. |

Additional information

| | |
|-------------------------------|---|
| Other information | : No supplementary information available. |
| Special transport precautions | : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted. |

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ADR

Transport document description :

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

Chlorine (7782-50-5)

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) | 100 |
| SARA Section 313 - Emission Reporting | 1.0 % |

15.2. International regulations

CANADA

Nitrogen (7727-37-9)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification : Class A - Compressed Gas

Chlorine (7782-50-5)

Listed on the Canadian DSL (Domestic Substances 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

Chlorine (7782-50-5)

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]

15.2.2. National regulations

Chlorine (7782-50-5)

Listed on AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (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)
Japanese Poisonous and Deleterious Substances Control Law
Listed on the Canadian IDL (Ingredient Disclosure List)

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

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Nitrogen (7727-37-9)

U.S. - Pennsylvania - RTK (Right to Know) List

Chlorine (7782-50-5)

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.

Revision date : 09/22/2014

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: see section 16:

| | |
|-------------------------------|--|
| Acute Tox. 2 (Inhalation:gas) | Acute toxicity (inhalation:gas) Category 2 |
| Compressed gas | Gases under pressure Compressed gas |
| Liquefied gas | Gases under pressure Liquefied gas |
| H280 | Contains gas under pressure; may explode if heated |
| H330 | Fatal 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.