

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

#### 1.1. Product identifier

Product form : Mixture  
 Product name : Nitric Oxide (0.29% - 0.99%) in Nitrogen  
 Product code : SG-2002-00581

#### 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

Air Liquide  
 2700 Post Oak Boulevard  
 Houston, TX 77056 - USA  
 T 1-800-819-1704  
[www.us.airliquide.com](http://www.us.airliquide.com)

#### 1.4. Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300

### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture

##### Classification (GHS-US)

Compressed gas H280  
 Acute Tox. 4 (Inhalation) H332

Full text of H-phrases: see section 16

#### 2.2. Label elements

##### GHS-US labeling

Hazard pictograms (GHS-US) :



Signal word (GHS-US) :

Warning

Hazard statements (GHS-US) :

H280 - Contains gas under pressure; may explode if heated  
 H332 - Harmful if inhaled  
 CGA-HG11 - Symptoms may be delayed

Precautionary statements (GHS-US) :

P202 - Do not handle until all safety precautions have been read and understood  
 P261 - Avoid breathing gas  
 P271 - Use only outdoors or in a well-ventilated area  
 P280 - Wear eye protection, face protection, protective gloves, protective clothing  
 P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing  
 P308+P313 - If exposed or concerned: Get medical advice/attention  
 P403 - Store in a well-ventilated place  
 P501 - Dispose of contents/container in accordance with local/regional/national/international regulations  
 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

# Nitric Oxide (0.29% - 0.99%) in Nitrogen

## Safety Data Sheet

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

### 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  | 99.01 - 99.71 | Compressed gas, H280  |
| Nitric oxide | (CAS No) 10102-43-9 | 0.29 - 0.99   | Ox. Gas 1, H270<br>Compressed gas, H280<br>Acute Tox. 1 (Inhalation:gas),<br>H330<br>Skin Corr. 1B, H314<br>STOT SE 2, H371 |

Full text of H-phrases: see section 16

### 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.
- 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 after inhalation : Harmful if inhaled.
- 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 to extinguish.

#### 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.

#### 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.

# Nitric Oxide (0.29% - 0.99%) in Nitrogen

## Safety Data Sheet

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

### 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. Use equipment rated for cylinder pressure. Close valve after each use and when empty.
- 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.
- 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 : None known.

### 7.3. Specific end use(s)

See Section 1.2.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

| Nitric Oxide (0.29% - 0.99%) in Nitrogen |                                     |                      |
|--|-------------------------------------|----------------------|
| ACGIH                                    | Not applicable                      |                      |
| OSHA                                     | Not applicable                      |                      |
| Nitrogen (7727-37-9)                     |                                     |                      |
| ACGIH                                    | Not applicable                      |                      |
| OSHA                                     | Not applicable                      |                      |
| Nitric oxide (10102-43-9)                |                                     |                      |
| ACGIH                                    | ACGIH TWA (ppm)                     | 25 ppm               |
| OSHA                                     | OSHA PEL (TWA) (mg/m <sup>3</sup> ) | 30 mg/m <sup>3</sup> |
| OSHA                                     | OSHA PEL (TWA) (ppm)                | 25 ppm               |

### 8.2. Exposure controls

- Appropriate engineering controls : Ensure exposure is below occupational exposure limits. Provide adequate general and local exhaust ventilation. Systems under pressure should be regularly checked for leakages. Oxygen detectors should be used when asphyxiating gases may be released. Consider work permit system e.g. for maintenance activities.
- Hand protection : Wear working gloves when handling gas containers. 29 CFR 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.

# Nitric Oxide (0.29% - 0.99%) in Nitrogen

## Safety Data Sheet

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

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                                  | : Clear, colorless gas.            |
| Molecular mass                              | : Not applicable for gas-mixtures. |
| Color                                       | : Colorless                        |
| Odor  | : Irritating/pungent odour         |
| Odor threshold                              | : No Data Available                |
| pH  | : No data available                |
| Relative evaporation rate (butyl acetate=1) | : No data available                |
| 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 Section 2.1 and 2.2          |
| Vapor pressure                              | : No data available                |
| Relative vapor density at 20 °C             | : No data available                |
| Relative density                            | : No data available                |
| Relative gas density                        | : Similar to air                   |
| Solubility                                  | : No data available                |
| Log Pow                                     | : No data available                |
| Log Kow                                     | : No data available                |
| Viscosity, kinematic                        | : No data available                |
| Viscosity, dynamic                          | : No data available                |
| Explosive properties                        | : Not applicable - not flammable.  |
| Oxidizing properties                        | : None.                            |
| Explosive limits                            | : Not applicable - not flammable   |

#### 9.2. Other information

No additional information available

### SECTION 10: Stability and reactivity

#### 10.1. Reactivity

None known.

#### 10.2. Chemical stability

Stable under normal conditions.

#### 10.3. Possibility of hazardous reactions

None known.

#### 10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

#### 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

Acute toxicity : Inhalation: Harmful if inhaled.

# Nitric Oxide (0.29% - 0.99%) in Nitrogen

## Safety Data Sheet

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

| Nitric Oxide (0.29% - 0.99%) in Nitrogen |                  |
|--|------------------|
| ATE US (gases)                           | 4500.000 ppmV/4h |
| ATE US (vapors)                          | 11.000 mg/l/4h   |
| ATE US (dust, mist)                      | 1.500 mg/l/4h    |

| Nitrogen (7727-37-9)      |               |
|---------------------------|---------------|
| LC50 inhalation rat (ppm) | 820000 ppm/4h |

| Nitric oxide (10102-43-9) |             |
|---------------------------|-------------|
| LC50 inhalation rat (ppm) | 57.5 ppm/4h |

|  |  |
|--|--|
| Skin corrosion/irritation                          | : Not classified   |
| Serious eye damage/irritation                      | : Not classified   |
| 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   |
| Aspiration hazard                                  | : Not classified   |
| Symptoms/injuries after inhalation                 | : Harmful if inhaled.  |
| 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

No additional information available

### 12.2. Persistence and degradability

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

| Nitric oxide (10102-43-9)     |                                     |
|-------------------------------|-------------------------------------|
| Persistence and degradability | Not applicable for inorganic gases. |

### 12.3. Bioaccumulative potential

| Nitrogen (7727-37-9)      |  |
|---------------------------|--|
| Log Pow                   | Not applicable for inorganic gases.          |
| Bioaccumulative potential | No ecological damage caused by this product. |

| Nitric oxide (10102-43-9) |                                     |
|---------------------------|-------------------------------------|
| Log Pow                   | Not applicable for inorganic gases. |
| Bioaccumulative potential | No data available.                  |

### 12.4. Mobility in soil

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

| Nitric oxide (10102-43-9) |   |
|---------------------------|---|
| 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        | : No known effects from this product.                |
| Effect on the global warming | : No known ecological damage caused by this product. |

# Nitric Oxide (0.29% - 0.99%) in Nitrogen

## Safety Data Sheet

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

### 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](http://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. (Nitric Oxide, Nitrogen)
- 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.

#### Additional information

- Other information : No supplementary information available.

#### ADR

- Transport document description : UN 1956, 2.2, (E)
- Class (ADR) : 2 - Gases
- Hazard identification number (Kemler No.) : 20
- Classification code (ADR) : 1A
- Hazard labels (ADR) : 2.2 - Non-flammable compressed gas



- Orange plates : An orange rectangular plate with a black border. It contains the hazard number '20' in the top half and the UN number '1956' in the bottom half, both in black text.

- Tunnel restriction code (ADR) : E
- LQ : 120ml
- Excepted quantities (ADR) : E1

#### Transport by sea

- UN-No. (IMDG) : 1956
- Proper Shipping Name (IMDG) : COMPRESSED GAS, N.O.S.
- Class (IMDG) : 2 - Gases

# Nitric Oxide (0.29% - 0.99%) in Nitrogen

## Safety Data Sheet

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

### 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

|   |     |
|---|-----|
| <b>Nitrogen (7727-37-9)</b>   |     |
| Listed on the United States TSCA (Toxic Substances Control Act) inventory   |     |
| <b>Nitric oxide (10102-43-9)</b>  |     |
| Listed on the United States TSCA (Toxic Substances Control Act) inventory<br>Listed on the United States SARA Section 302 |     |
| SARA Section 302 Threshold Planning Quantity (TPQ)  | 100 |

### 15.2. International regulations

#### CANADA

|   |  |
|---|--|
| <b>Nitrogen (7727-37-9)</b>                           |  |
| Listed on the Canadian DSL (Domestic Substances List) |  |
| WHMIS Classification                                  | Class A - Compressed Gas   |
| <b>Nitric oxide (10102-43-9)</b>                      |  |
| Listed on the Canadian DSL (Domestic Substances List) |  |
| WHMIS Classification                                  | Class A - Compressed Gas<br>Class C - Oxidizing Material<br>Class D Division 1 Subdivision A - Very toxic material causing immediate and serious toxic effects<br>Class E - Corrosive Material |

### EU-Regulations

|  |  |
|--|--|
| <b>Nitrogen (7727-37-9)</b>  |  |
| Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances) |  |
| <b>Nitric oxide (10102-43-9)</b>   |  |
| 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

|  |  |
|--|--|
| <b>Nitrogen (7727-37-9)</b>  |  |
| Listed on the AICS (Australian Inventory of Chemical Substances)<br>Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)<br>Listed on the Korean ECL (Existing Chemicals List)<br>Listed on NZIoC (New Zealand Inventory of Chemicals)<br>Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)  |  |
| <b>Nitric oxide (10102-43-9)</b>   |  |
| Listed on the AICS (Australian Inventory of Chemical Substances)<br>Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)<br>Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory<br>Listed on the Korean ECL (Existing Chemicals List)<br>Listed on NZIoC (New Zealand Inventory of Chemicals)<br>Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)<br>Listed on the Canadian IDL (Ingredient Disclosure List) |  |

### 15.3. US State regulations

# Nitric Oxide (0.29% - 0.99%) in Nitrogen

## Safety Data Sheet

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

### Nitric oxide (10102-43-9)

U.S. - Massachusetts - Right To Know List  
U.S. - New Jersey - Right to Know Hazardous Substance List  
U.S. - Pennsylvania - RTK (Right to Know) - 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. 1 (Inhalation:gas) | Acute toxicity (inhalation:gas) Category 1                  |
| Acute Tox. 4 (Inhalation)     | Acute toxicity (inhalation) Category 4                      |
| Compressed gas                | Gases under pressure Compressed gas                         |
| Ox. Gas 1                     | Oxidizing gases Category 1                                  |
| Skin Corr. 1B                 | Skin corrosion/irritation Category 1B                       |
| STOT SE 2                     | Specific target organ toxicity (single exposure) Category 2 |
| H270                          | May cause or intensify fire; oxidizer                       |
| H280                          | Contains gas under pressure; may explode if heated          |
| H314                          | Causes severe skin burns and eye damage                     |
| H330                          | Fatal if inhaled  |
| H332                          | Harmful if inhaled  |
| H371                          | May cause damage to organs                                  |

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 product. To the best of Air Liquide America Corporation'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 product 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.*