

# MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

## 1. PRODUCT IDENTIFICATION

**CHEMICAL NAME; CLASS: NON-FLAMMABLE GAS MIXTURE**  
**Containing One or More of the Following Components in a Nitrogen Balance:**  
**Ammonia, 0.0001-0.05%; Oxygen, 0-23.5%**

**SYNONYMS:** Not Applicable

**CHEMICAL FAMILY NAME:** Not Applicable

**FORMULA:** Not Applicable

**Document Number:** 50023

**Note:** The Material Safety Data Sheet is for this gas mixture supplied in cylinders with 33 cubic feet (935 liters) or less gas capacity (DOT - 39 cylinders). This MSDS has been developed for various gas mixtures with the composition of components within the ranges listed in Section 2 (Composition and Information on Ingredients). Refer to the product label for information on the actual composition of the product.

**PRODUCT USE:** Calibration of Monitoring and Research Equipment  
**SUPPLIER/MANUFACTURER'S NAME:** AIR LIQUIDE AMERICA L.P.  
**ADDRESS:** 821 Chesapeake Driv  
Cambridge, MD 21613  
**EMERGENCY PHONE:** CHEMTREC: 1-800-424-9300  
**BUSINESS PHONE:** 1-410-228-6400  
General MSDS Information 1-713/868-0440  
Fax on Demand: 1-800/231-1366

## 2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIH-TLV		OSHA-PEL		NIOSH IDLH ppm	OTHER ppm
			TWA ppm	STEL ppm	PEL ppm	TWA ppm		
Ammonia	7664-41-7	0.0001-0.05%	25	35	NE	50 35 ppm (Vacated 1989 PEL)	300	NIOSH RELs: TWA = 25 STEL = 35 DFG MAKs: TWA = 20 PEAK = 2•MAK15 min., average value, 1 hr interval DFG MAK Pregnancy Risk Classification: C
Oxygen	7782-44-7	0-23.5%	There are no specific exposure limits for Oxygen. Oxygen levels should be maintained above 19.5%.					
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.

NIC = Notice of Intended Change

See Section 16 for Definitions of Terms Used.

**NOTE (1):** ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-1998 format. This gas mixture has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

## 3. HAZARD IDENTIFICATION

**EMERGENCY OVERVIEW:** This gas mixture is a colorless gas which is odorless or has a mild, ammonia odor. Ammonia, a component of this gas mixture can be severely irritating to over-exposed individuals. Symptoms of such over-exposure can include choking, coughing, watery eyes, labored breathing, and other adverse health effects. Releases of this gas mixture may also produce oxygen-deficient atmospheres (especially in confined spaces or other poorly-ventilated environments); individuals in such atmospheres may be asphyxiated.

**SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE:** The most significant route of over-exposure for this gas mixture is by inhalation.

**INHALATION:** Due to the small size of an individual cylinder of this gas mixture, no unusual health effects from over-exposure to the product are anticipated under routine circumstances of use. A significant health hazard associated with this gas mixture is inhalation of Ammonia (a component of this gas mixture), which can lead to irritation of the nose and throat. Such exposure may occur if this gas mixture is released in a poorly ventilated or confined space. Ammonia over-exposures by inhalation can result in emphysema. The symptoms associated with specific Ammonia concentrations are as follows:

### CONCENTRATION

#### OF AMMONIA

0.6 - 53 ppm

25 - 50 ppm

100 - 150 ppm Immediate irritation of the throat, which may be tolerated for an hour.

400 - 700 ppm Immediate, severe irritation of the respiratory system and eyes occurs.

> 5000 ppm

#### OBSERVED EFFECT

Odor Threshold

Irritation of the eyes and mucous membranes, which can be tolerated for several hours.

100 - 150 ppm Immediate irritation of the throat, which may be tolerated for an hour.

400 - 700 ppm Immediate, severe irritation of the respiratory system and eyes occurs.

This level of exposure may result in rapid death due to suffocation or fluid in the lungs. Exposure to concentrations in excess of 5000 ppm may cause laryngeal spasms, resulting in death.

**NOTE:**

This gas mixture contains 1-500 ppm Ammonia. Data pertinent to higher concentrations of Ammonia are provided to give complete information on effects observed in humans after over-exposures have occurred.

Another significant health hazard associated with this gas mixture is when this gas mixture contains less than 19.5% Oxygen and is released in a small, poorly-ventilated area (i.e. an enclosed or confined space). Under this circumstance, an oxygen-deficient environment may occur. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of over-exposure, death may occur. The effects associated with various levels of oxygen are as follows:

### CONCENTRATION OF OXYGEN

12-16% Oxygen:

10-14% Oxygen:

6-10% Oxygen:

Below 6%:

#### OBSERVED EFFECT

Breathing and pulse rate increased, muscular coordination slightly disturbed.

Emotional upset, abnormal fatigue, disturbed respiration.

Nausea, vomiting, collapse, or loss of consciousness.

Convulsive movements, possible respiratory collapse, and death.

**CONTACT WITH SKIN or EYES:** Contact of the gas mixture with the skin may lead to irritation, redness, and dermatitis, and burns, depending upon concentration and duration of exposure. Contact of the gas mixture with the eyes will be irritating.

**HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms.** Over-exposure to this gas mixture may cause the following health effects:

**ACUTE:** Due to the small size of the individual cylinder of this gas mixture, no unusual health effects from exposure to the product are anticipated under routine circumstances of use. This gas is irritating to eyes, skin, mucous membranes, and any other exposed tissue. If inhaled, irritation of the respiratory system may occur, with coughing, and breathing difficulty.

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM			
HEALTH HAZARD	(BLUE)	3	
FLAMMABILITY HAZARD	(RED)	0	
PHYSICAL HAZARD	(YELLOW)	0	
PROTECTIVE EQUIPMENT			
EYES	RESPIRATORY	HANDS	BODY
See Section 8			
For Routine Industrial Use and Handling Applications			

### 3. HAZARD IDENTIFICATION (Continued)

**CHRONIC:** Persistent irritation of the skin, as well as dermatitis, may result from repeated exposures to this gas. Repeated Ammonia overexposures by inhalation can result in emphysema. Chronic exposure to oxygen-deficient atmospheres (below 18% oxygen in air) may affect the heart and nervous system.

**TARGET ORGANS:** ACUTE: Respiratory system, skin, eyes. CHRONIC: Respiratory system, skin, heart.

### 4. FIRST-AID MEASURES

**RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO THIS GAS MIXTURE WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus must be worn.** Victim(s) who experience any adverse effect after over-exposure to this gas mixture 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).

No unusual health effects are anticipated after exposure to this gas mixture, due to the small cylinder size. If any adverse symptom develops after over-exposure to this gas mixture, remove victim(s) to fresh air as quickly as possible. Only trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation if necessary.

**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 contaminate 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 while 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.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** Acute or chronic respiratory conditions may be aggravated by over-exposure to the components of this gas mixture.

**RECOMMENDATIONS TO PHYSICIANS:** Administer oxygen, if necessary; treat symptoms; eliminate exposure. Be observant for the signs of pulmonary edema.

### 5. FIRE-FIGHTING MEASURES

**FLASH POINT, (method):** Not applicable.

**AUTOIGNITION TEMPERATURE:** Not applicable.

**FLAMMABLE LIMITS (in air by volume, %):**

Lower (LEL): Not applicable.

Upper (UEL): Not applicable.

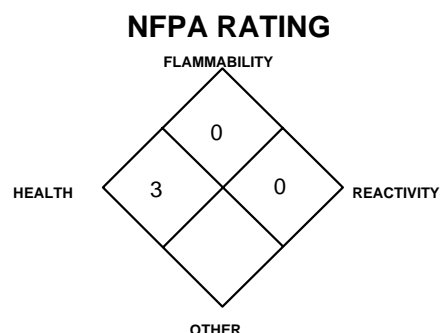
**FIRE EXTINGUISHING MATERIALS:** Non-flammable gas mixture. Use extinguishing media appropriate for surrounding fire.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** This gas mixture may be extremely irritating and presents a significant contact hazard to firefighters. This gas mixture is not 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.



### 6. ACCIDENTAL RELEASE MEASURES

**LEAK RESPONSE:** Due to the small size and content of the cylinder, an accidental release of this gas mixture presents significantly less risk Ammonia over-exposure, an oxygen deficient environment, and other safety hazards 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 immediate area. Such releases 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 Ammonia and Oxygen. The concentration of Ammonia must be at acceptable levels (see Section 2, Composition on Information on Ingredients) and the atmosphere must have at least 19.5 percent oxygen before personnel can be allowed in the area without Self-Contained Breathing Apparatus.

If leaking incidentally from the cylinder, contact your supplier.

### 7. HANDLING and USE

**WORK PRACTICES AND HYGIENE PRACTICES:** All work practices should minimize the release of gas mixture containing Ammonia. Eye wash stations/safety showers should be near areas where this gas mixture is used or stored. All work operations should be monitored in such a way that emergency personnel can be immediately contacted in the event of a release. Do not attempt to repair, adjust, or in any other way modify the cylinders containing this gas mixture. If there is a malfunction or another type of operational problem, contact nearest distributor immediately.

**STORAGE AND HANDLING PRACTICES:** Cylinders should be firmly secured to prevent falling or being knocked-over. Cylinders must be protected from the environment, and preferably kept at room temperature (approximately 21°C [70°F]). Cylinders should be stored in dry, well-ventilated areas, away from sources of heat, ignition, and direct sunlight. Protect cylinders against physical damage.

Full and empty cylinders should be segregated. Use a first-in, first-out inventory system to prevent full containers from being stored for long periods of time. These cylinders are not refillable. **WARNING! Do not refill DOT 39 cylinders. To do so may cause personal injury or property damage.**

**SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS:** **WARNING!** Compressed gases can present significant safety hazards. During cylinder use, use equipment designed for these specific cylinders. Ensure all lines and equipment are rated for proper service pressure.

**PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT:** Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely. Always use product in areas where adequate ventilation is provided.

### 8. EXPOSURE CONTROLS - PERSONAL PROTECTION

**RESPIRATORY PROTECTION:** No special respiratory protection is required under normal circumstances of use. Use supplied air respiratory protection if the levels of components exceeds exposure limits presented in Section 2 (Composition and Information of Ingredients) and Oxygen levels are below 19.5%, or unknown, during emergency response to a release of this gas mixture. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations, or the Canadian CSA Standard Z94.4-93 and applicable standards of Canadian Provinces. Oxygen levels below 19.16.33% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998). The following NIOSH respirator recommendations are in place for Ammonia, a component of this gas mixture.

#### **AMMONIA CONCENTRATION**

Up to 250 ppm:

Up to 300 ppm:

Emergency or Planned Entry

Escape:

#### **RESPIRATORY PROTECTION**

Any Chemical Cartridge Respirator with cartridge(s) providing protection against Ammonia, or any Supplied-Air Respirator (SAR).

Any SAR operated in a continuous-flow mode, or any Powered, Air-Purifying Respirator(PAPR) with cartridge(s) providing protection against ammonia, or any Chemical Cartridge Respirator with a full facepiece and cartridge(s) providing protection ammonia, or any Air-Purifying, Full-Facepiece Respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection ammonia, or any Self-Contained Breathing Apparatus (SCBA) with a full facepiece, or any SAR with a full facepiece.

Any SCBA that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode, or any SAR that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary SCBA operated in pressure-demand or other positive-pressure mode.

Any Air-Purifying, Full-Facepiece Respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against ammonia, or any appropriate escape-type, SCBA.

## 8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

**EYE PROTECTION:** Safety glasses. If necessary, refer to U.S. OSHA 29 CFR 1910.133 or appropriate Canadian Standards.

**HAND PROTECTION:** Wear leather gloves when handling cylinders. Chemically resistant gloves should be worn when using this gas mixture. If necessary, refer to U.S. OSHA 29 CFR 1910.138 or appropriate Standards of Canada.

**BODY PROTECTION:** No special protection is needed under normal circumstances of use. If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee's feet may be exposed to electrical hazards, use foot protection, as described in U.S. OSHA 29 CFR 1910.136.

## 9. PHYSICAL and CHEMICAL PROPERTIES

The following information is for Nitrogen, the main component of this gas mixture.

**GAS DENSITY @ 32°F (0°C) and 1 atm:** .072 lbs/ft<sup>3</sup> (1.153 kg/m<sup>3</sup>)

**FREEZING/MELTING POINT @ 10 psig:** -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

**EVAPORATION RATE (nBuAc = 1):** Not applicable.

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

**COEFFICIENT WATER/OIL DISTRIBUTION:** Not applicable.

**BOILING POINT:** -320.4°F (-195.8°C)

**pH:** Not applicable.

**MOLECULAR WEIGHT:** 28.01

**EXPANSION RATIO:** Not applicable.

**SPECIFIC VOLUME (ft<sup>3</sup>/lb):** 13.8

The following information is for this gas mixture.

**ODOR THRESHOLD:** For Ammonia: Reported values vary widely; 0.6 to 53 ppm; geometric mean: 17 ppm (detection)

**APPEARANCE AND COLOR:** This gas mixture is a colorless gas which is odorless or has a mild, ammonia odor.

**HOW TO DETECT THIS SUBSTANCE (warning properties):** There are no unusual warning properties associated with a release of this gas mixture.

## 10. STABILITY and REACTIVITY

**STABILITY:** Normally stable in gaseous state.

**DECOMPOSITION PRODUCTS:** The thermal decomposition products of Ammonia include ammonium hydroxide and a variety of nitrogen-containing compounds. The other components of this gas mixture do not decompose, per se, but can react with other compounds in the heat of a fire.

**MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE:** Titanium will burn in Nitrogen (the main component of this gas mixture). Lithium reacts slowly with Nitrogen at ambient temperatures. Ammonia, a component of this gas mixture, is not compatible with most metals, acids, oxidizers.

**HAZARDOUS POLYMERIZATION:** Will not occur.

**CONDITIONS TO AVOID:** Contact with incompatible materials. Cylinders exposed to high temperatures or direct flame can rupture or burst.

## 11. TOXICOLOGICAL INFORMATION

**TOXICITY DATA:** The following toxicology data are available for the components of this gas mixture:

### AMMONIA:

Mutation in Microorganisms-Escherichia coli  
1500 ppm/3 hours

Cytogenetic Analysis (Inhalation-Rat) 19,800  
mg/m<sup>3</sup>/16 weeks

TCLo (Inhalation-Human) 20 ppm: Irritant  
effects

LCLo (Inhalation-Human) 30,000 ppm/5  
minutes

LCLo (Inhalation-Human) 5000 ppm/5 minutes  
LDLo (Route Unknown-Man) 132 mg/kg

TDLo (Oral-Man) 15 µL/kg: Gastrointestinal:  
changes in structure or function of  
esophagus

LCLo (Inhalation-Rat) 2000 ppm/4 hours

TCLo (Inhalation-Rat) 300 ppm/6 hours/5 days-  
intermittent: Brain and Coverings: other  
degenerative changes; Blood: other  
changes; Biochemical: Metabolism  
(Intermediary): amino acids (including  
renal excretion)

TCLo (Inhalation-Rat) 455 mg/m<sup>3</sup>/8 hours/90  
days-intermittent: Sense Organs and  
Special Senses (Olfaction): effect, not  
otherwise specified; Lungs, Thorax, or  
Respiration: dyspnea; Related to Chronic  
Data: death

### AMMONIA (continued):

TCLo (Inhalation-Rat) 960 mg/m<sup>3</sup>/4 hours/17  
weeks-intermittent: Brain and Coverings:  
recordings from specific areas of CNS

LC<sub>50</sub> (Inhalation-Mouse) 4837 ppm/1 hour

LC<sub>50</sub> (Inhalation-Mouse) 4230 ppm/1 hour:  
Behavioral: tremor, convulsions or effect  
on seizure threshold, ataxia

LC<sub>50</sub> (Inhalation-Cat) 7 gm/m<sup>3</sup>/1 hour:  
Peripheral Nerve and Sensation: flaccid  
paralysis without anesthesia (usually  
neuromuscular blockage); Behavioral:  
excitement

LC<sub>50</sub> (Inhalation-Rabbit) 7 gm/m<sup>3</sup>/1 hour:  
Peripheral Nerve and Sensation: flaccid  
paralysis without anesthesia (usually  
neuromuscular blockage); Behavioral:  
excitement

TCLo (Inhalation-Mouse) 711 ppm/6 hours/14  
days-intermittent: Sense Organs and  
Special Senses (Olfaction): effect, not  
otherwise specified

TCLo (Inhalation-Cat, adult) 1000 ppm/10  
minutes

TCLo (Inhalation-Rabbit) 470 mg/m<sup>3</sup>/8  
hours/90 days-intermittent: Sense Organs  
and Special Senses (Eye): corneal  
damage, effect, not otherwise specified

### AMMONIA (continued):

LCLo (Inhalation-Cat, adult) 7000 ppm/1 hour

LCLo (Inhalation-Rabbit, adult) 7000 ppm/1  
hour

LCLo (Inhalation-Mammal) 5000 ppm/5  
minutes

TCLo (Inhalation-Dog) 470 mg/m<sup>3</sup>/8 hours/90  
days-intermittent: Sense Organs and  
Special Senses (Eye): lacrimation

TCLo (Inhalation-Pig) 145 ppm/5 weeks-  
continuous: Behavioral: food intake  
(animal); Nutritional and Gross Metabolic:  
weight loss or decreased weight gain

TCLo (Inhalation-Guinea Pig) 470 mg/m<sup>3</sup>/8  
hours/90 days-intermittent: Lungs, Thorax,  
or Respiration: other changes; Kidney,  
Urethra, Bladder: changes in tubules  
(including acute renal failure, acute tubular  
necrosis); Related to Chronic Data: death

### NITROGEN:

There are no specific toxicology data for  
Nitrogen. Nitrogen is a simple asphyxiant,  
which acts to displace oxygen in the  
environment.

**SUSPECTED CANCER AGENT:** The components of this gas mixture are not found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, and IARC; therefore, they are not considered to be, nor suspected to be, cancer-causing agents by these agencies.

**IRRITANCY OF PRODUCT:** This gas mixture may cause severe irritation to contaminated tissue.

**SENSITIZATION TO THE PRODUCT:** This gas mixture is not known to cause sensitization in humans.

**REPRODUCTIVE TOXICITY INFORMATION:** Listed below is information concerning the effects of this gas mixture and its components on the human reproductive system.

Mutagenicity: No mutagenicity effects have been described for this gas mixture.

Embryotoxicity: No embryotoxic effects have been described for this gas mixture.

Teratogenicity: No teratogenicity effects have been described for this gas mixture.

Reproductive Toxicity: No reproductive toxicity effects have been described for this gas mixture.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

**BIOLOGICAL EXPOSURE INDICES (BEIs):** Currently, Biological Exposure Indices (BEIs) have not been determined for the components of this gas mixture.

## 12. ECOLOGICAL INFORMATION

**ENVIRONMENTAL STABILITY:** The components of this gas mixture occur naturally in the atmosphere. The gas will be dissipated rapidly in well-ventilated areas. The following environmental data are applicable to the components of this gas mixture.

**AMMONIA:** Water Solubility: 47% in water at 0°C; 34% in water at 20°C; 28% in water at 31°C. BIOCONCENTRATION: Plants have a high affinity for gaseous ammonia when leaf stomata are open in daylight. BIODEGRADATION: Ammonia is rapidly converted to nitrate by nitrification.

**OXYGEN:** Water Solubility = 1 volume Oxygen/32 volumes water at 20°C. Log K<sub>ow</sub> = -0.65

**NITROGEN:** Water Solubility = 2.4 volumes Nitrogen/100 volumes water at 0°C. 1.6 volumes Nitrogen/100 volumes water at 20°C.

**EFFECT OF MATERIAL ON PLANTS or ANIMALS:** Due to the nature of this gas mixture, animals exposed to this gas mixture may experience irritation, chemical burns, or other adverse health effects. Oxygen displacement can also be a factor in the toxicity of this gas mixture. Plants contaminated with this gas mixture may be adversely affected or destroyed.

**EFFECT OF CHEMICAL ON AQUATIC LIFE:** Ammonia, a component of this gas mixture, is very soluble in water, and even low concentrations of Ammonia in water is detrimental to aquatic life. If a release of this gas mixture occurs near a river or other body of water, the release has the potential to kill fish and other aquatic life.

### 13. DISPOSAL CONSIDERATIONS

**PREPARING WASTES FOR DISPOSAL PREPARING WASTES FOR DISPOSAL:** Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Cylinders with undesired residual product may be safely vented outdoors with the proper regulator. For further information, refer to Section 16 (Other Information).

### 14. TRANSPORTATION INFORMATION

**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:** 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.

**TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS:** This gas is considered 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:** None

**PASSENGER CARRYING SHIP INDEX:** None

**PASSENGER CARRYING ROAD VEHICLE OR PASSENGER CARRYING RAILWAY VEHICLE INDEX:** 75

**NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000):** 121

**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).

### 15. REGULATORY INFORMATION

**ADDITIONAL U.S. REGULATIONS:**

**U.S. SARA REPORTING REQUIREMENTS:** This gas mixture is subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act, as follows:

CHEMICAL NAME	SARA 302 (40 CFR 355, Appendix A)	SARA 304 (40 CFR Table 302.4)	SARA 313 (40 CFR 372.65)
Ammonia	YES	YES	YES

**U.S. SARA SECTION 302 EXTREMELY HAZARDOUS SUBSTANCE THRESHOLD PLANNING QUANTITY:** Ammonia = 500 lb (227 kg)

**U.S. SARA SECTION 304 EXTREMELY HAZARDOUS SUBSTANCE REPORTABLE QUANTITY:** Ammonia = 100 lb (45.4 kg)

**U.S. TSCA INVENTORY STATUS:** The components of this gas mixture are listed on the TSCA Inventory.

**U.S. CERCLA REPORTABLE QUANTITY (RQ):** Ammonia = 100 lb (45.4 kg)

**OTHER U.S. FEDERAL REGULATIONS:**

- Ammonia is subject to the reporting requirements of CFR 29 1910.1000. Ammonia is listed on Table Z.1
- Ammonia is subject to the reporting requirements of Section 112(r) of the Clean Air Act. The Threshold Quantity of Ammonia is 10,000 lbs.
- The regulations of the Process Safety Management of Highly Hazardous Chemicals are not be applicable (29 CFR 1910.119). Under this regulation, only Anhydrous Ammonia is listed in Appendix A; this listing is not pertinent to this gas mixture.
- This gas mixture does not contain any Class I or Class II ozone depleting chemicals (40 CFR part 82).
- Nitrogen and Oxygen are not listed as Regulated Substances, per 40 CFR, Part 68, of the Risk Management for Chemical Releases. Ammonia is listed under this regulation in Table 1 as Regulated Substances (Toxic Substances); however, this listing is pertinent to Ammonia in concentrations of 20% or more.

**U.S. STATE REGULATORY INFORMATION:** The components of this gas mixture are covered under the following specific State regulations:

**Alaska - Designated Toxic and Hazardous Substances:** Ammonia.

**California - Permissible Exposure Limits for Chemical Contaminants:** Nitrogen, Ammonia.

**Florida - Substance List:** Oxygen, Ammonia.

**Illinois - Toxic Substance List:** Ammonia.

**Kansas - Section 302/313 List:** Ammonia.

**Massachusetts - Substance List:** Oxygen, Ammonia.

**Michigan - Critical Materials Register:** No.

**Minnesota - List of Hazardous Substances:** Ammonia.

**Missouri - Employer Information/Toxic Substance List:** Ammonia.

**New Jersey - Right to Know Hazardous Substance List:** Oxygen, Nitrogen, Ammonia.

**North Dakota - List of Hazardous Chemicals, Reportable Quantities:** Ammonia.

**Pennsylvania - Hazardous Substance List:** Oxygen, Nitrogen, Ammonia.

**Rhode Island - Hazardous Substance List:** Oxygen, Ammonia.

**Texas - Hazardous Substance List:** No.

**West Virginia - Hazardous Substance List:** Ammonia.

**Wisconsin - Toxic and Hazardous Substances:** Ammonia.

**CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65):** No component of this gas mixture is on the California Proposition 65 lists.

**ADDITIONAL CANADIAN REGULATIONS:**

**CANADIAN DSL/NDSL INVENTORY STATUS:** The components of this gas mixture are listed on the DSL Inventory.

**CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS:** The components of this gas mixture are not on the CEPA Priorities Substances Lists.

**CANADIAN WHMIS CLASSIFICATION:** This gas mixture is categorized as a Controlled Product, Hazard Classes A and D2B, as per the Controlled Product Regulations.

## 16. OTHER INFORMATION

### INFORMATION ABOUT DOT-39 NRC (Non-Refillable Cylinder) PRODUCTS

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 packaged in these cylinders are Nonflammable n.o.s., UN 1956. A small percentage of calibration gases packaged in DOT 39 cylinders are flammable or oxidizing gas mixtures.

For disposal of used 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 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. Air Liquide America 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 involves some preparation before the metal dealer may accept them. We perform this operation as a service 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 serious injury or death.

Further information about the handling of compressed gases can be found in the following pamphlets published by: Compressed Gas Association Inc. (CGA), 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102. Telephone: (703) 412-0900.

P-1 "Safe Handling of Compressed Gases in Containers"  
AV-1 "Safe Handling and Storage of Compressed Gases"  
"Handbook of Compressed Gases"

**PREPARED BY:** CHEMICAL SAFETY ASSOCIATES, Inc.  
PO Box 3519, La Mesa, CA 91944-3519  
619/670-0609

Fax on Demand: 1-800/231-1366



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 gas mixture. 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 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.