



**MATERIAL SAFETY DATA SHEET**

**PRODUCT NAME: AMMONIA (0-5%) IN NITROGEN**

**1. Chemical Product and Company Identification**

**BOC Gases,  
Division of,  
The BOC Group, Inc.  
575 Mountain Avenue  
Murray Hill, NJ 07974**

**BOC Gases  
Division of  
BOC Canada Limited  
5975 Falbourne Street, Unit 2  
Mississauga, Ontario L5R 3W6**

**TELEPHONE NUMBER: (908) 464-8100  
24-HOUR EMERGENCY TELEPHONE  
NUMBER: CHEMTREC (800) 424-9300**

**TELEPHONE NUMBER: (905) 501-1700  
24-HOUR EMERGENCY TELEPHONE  
NUMBER: (905) 501-0802  
EMERGENCY RESPONSE PLAN NO: 2-0101**

**PRODUCT NAME: AMMONIA (0-5%) IN NITROGEN  
CHEMICAL NAME: Gas Mixture  
COMMON NAMES/SYNONYMS: None  
TDG (Canada) CLASSIFICATION: A, D2B  
WHMIS CLASSIFICATION: 2.2**

**PREPARED BY: Loss Control (908)464-8100/(905)501-1700  
PREPARATION DATE: 6/1/95  
REVIEW DATES: 6/1/99**

**2. Composition, Information on Ingredients**

**EXPOSURE LIMITS<sup>1</sup>:**

INGREDIENT	% VOLUME	PEL-OSHA <sup>2</sup>	TLV-ACGIH <sup>3</sup>	LD <sub>50</sub> or LC <sub>50</sub> Route/Species
Nitrogen FORMULA: N <sub>2</sub> CAS: 7727-37-0 RTECS #: QW9700000	95-100	Not Available	Not Available	Simple Asphyxiant
Ammonia FORMULA: NH <sub>3</sub> CAS: 7664-41-7 RTECS #: BO0875000	0-5	Not Available	25 ppm 35 ppm (STEL)	LC <sub>50</sub> : 7338 ppm inhalation/rat (1 H)

<sup>1</sup> Refer to individual state of provincial regulations, as applicable, for limits which may be more stringent than those listed here.  
<sup>2</sup> As stated in 29 CFR 1910, Subpart Z (revised July 1, 1993)  
<sup>3</sup> As stated in the ACGIH 1994-1995 Threshold Limit Values for Chemical Substances and Physical Agents.

OSHA Regulatory Status: This material is classified as hazardous under OSHA regulations.

**3. Hazards Identification**

**EMERGENCY OVERVIEW**

Colorless gas with ammonia odor which may cause eye, skin and respiratory irritation. High concentrations of gas may accumulate in confined or poorly ventilated areas, displacing oxygen and causing unconsciousness or death. Ammonia may irritate the eyes, skin and respiratory system. Exposure to high concentrations may cause eye damage. Inhalation of high concentrations may damage the lungs causing chemical pneumonitis and swelling with fluid retention (edema). Contents under pressure. Use and store below 125 °F.

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**ROUTE OF ENTRY:**

Skin Contact Yes	Skin Absorption No	Eye Contact Yes	Inhalation Yes	Ingestion No
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**HEALTH EFFECTS:**

Exposure Limits Yes	Irritant Yes	Sensitization No
Teratogen No	Reproductive Hazard No	Mutagen No
Synergistic Effects Absorption in particles enhances irritation effects.		

Carcinogenicity: -- NTP: No IARC: No OSHA: No

**EYE EFFECTS:**

Contact may cause eye irritation with associated redness, swelling, and tears and possible damage.

**SKIN EFFECTS:**

Contact may cause skin irritation, redness, and dermatitis.

**INGESTION EFFECTS:**

Accidental ingestion is unlikely as at ambient temperature and pressure (STP) this product is a gas.

**INHALATION EFFECTS:**

Products which contain small amounts of ammonia may act as simple asphyxiants. Release of sufficient quantities of these product may cause asphyxiation or suffocation by displacing oxygen content in the air.

Ammonia is irritating and corrosive to the upper respiratory system and mucous membranes. Inhalation may cause chemical pneumonitis and pulmonary edema. Symptoms are dependent upon concentration inhaled and may include burning sensation, coughing, wheezing, shortness of breath, headache, nausea with eventual collapse and death.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** May aggravate pre-existing eye, skin, and respiratory disorders.

**NFPA HAZARD CODES**

Health: 1  
Flammability: 0  
Instability: 0

**HMS HAZARD CODES**

Health: 1  
Flammability: 0  
Reactivity: 0

**RATINGS SYSTEM**

0 = No Hazard  
1 = Slight Hazard  
2 = Moderate Hazard  
3 = Serious Hazard  
4 = Severe Hazard

**4. First Aid Measures**

**EYES:**

Immediately flush eyes with large amounts of water for at least 15 minutes opening and closing eyelids to ensure adequate rinsing. Seek medical attention.

**SKIN:**

Remove contaminated clothing and flush affected area with large quantities of water. If irritation persists, seek medical attention.

MSDS: G-271  
Revised: 6/1/99

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**INGESTION:**

Product is a gas.

**INHALATION:**

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Conscious persons should be assisted to an uncontaminated area and inhale fresh air. If breathing is difficult, administer oxygen. Quick removal from the contaminated area is most important. If breathing is difficult, administer oxygen. If breathing has stopped, give artificial respiration. Seek medical attention.

**5. Fire Fighting Measures**

Conditions of Flammability: Not flammable		
Flash point: None	Method: Not Applicable	Autoignition Temperature: None
LEL(%): None		UEL(%): none
Hazardous combustion products: NH <sub>3</sub> and NO <sub>x</sub>		
Sensitivity to mechanical shock: None		
Sensitivity to static discharge: None		

**FIRE AND EXPLOSION HAZARDS:**

The majority of this product constitutes a nonflammable, inert gas. Ammonia is present in concentrations below the Lower Explosive Limits (LEL). Cylinders may rupture violently from pressure when involved in a fire situation.

**EXTINGUISHING MEDIA:**

Water spray to keep cylinders cool. Extinguishing agent appropriate for the combustible material.

**FIRE FIGHTING INSTRUCTIONS:**

Continue to cool heat or flame exposed containers until well after flames are extinguished. Since ammonia is soluble in water, it is the best extinguishing medium – Water will extinguish the fire and also absorb the escaped ammonia gas. Prevent entry of corrosive run-off waters into waterways and sewers.

**6. Accidental Release Measures**

Evacuate all personnel from affected area. Deny entry to unauthorized and unprotected individuals. Use appropriate protective equipment including respiratory protection for high or unknown concentrations. Personnel should not re-enter hazard area until ammonia is dispersed and adequate atmospheric oxygen is re-established. If leak is in user's equipment, be certain to purge piping with inert gas prior to attempting repairs. If leak is in container or container valve, contact the appropriate emergency telephone number listed in Section 1 or call your closest BOC location.

**7. Handling and Storage**

**Electrical classification:**

Non-hazardous

Stationary customer site vessels should operate in accordance with the manufacturer's and BOC's instruction. Do not attempt to repair, adjust or in any other way modify the operation of these vessels. If there is a malfunction or other type of operations problem with the vessel, contact the closest BOC location immediately.

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Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the system.

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125°F (52°C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in-first out" inventory system to prevent full cylinders being stored for excessive periods of time.

For additional storage recommendations, consult Compressed Gas Association's Pamphlets P-1.

Never carry a compressed gas cylinder or a container of a gas in cryogenic liquid form in an enclosed space such as a car trunk, van or station wagon. A leak can result in a fire, explosion, asphyxiation or a toxic exposure.

## **8. Exposure Controls, Personal Protection**

### **ENGINEERING CONTROLS:**

Use local exhaust ventilation as necessary to maintain atmospheric oxygen levels above 19.5% and control air contaminants to below acceptable exposure guidelines.

### **EYE/FACE PROTECTION:**

Goggles should be worn.

### **SKIN PROTECTION:**

Protective gloves made of suitable material (i.e.: butyl rubber) appropriate for the job.

### **RESPIRATORY PROTECTION:**

Positive pressure air line with full facepiece and escape bottle or SCBA should be available for emergency use.

### **OTHER/GENERAL PROTECTION:**

Safety shoes, emergency eyewash station.

IDLH: 300 ppm (ammonia)

## 9. Physical and Chemical Properties

PARAMETER	VALUE	UNITS
Physical state (gas, liquid, solid)	: Gas	
Vapor pressure	: Above critical temp.	
Vapor density (Air = 1)	: Not Available	
Evaporation point	: Not Available	
Boiling point	: -195.79	°C (liquid, as N <sub>2</sub> )
Freezing point:	: Not Available	
PH	: Not Available	
Specific gravity at STP	: Not Available	
Oil/water partition coefficient	: Not Available	
Solubility (H <sub>2</sub> O)	: Negligible	
Odor threshold	: 4.68 ppm	(Pure NH <sub>3</sub> in air)
Odor and appearance	: Colorless gas with ammonia odor	

## 10. Stability and Reactivity

### STABILITY:

Stable

### INCOMPATIBLE MATERIALS:

Ammonia is corrosive to copper, zinc, and many metal surfaces. May react with hypochlorite or other halogen sources to form explosive compounds which are pressure and temperature sensitive.

### HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition will produce toxic fumes of NH<sub>3</sub> and NO<sub>x</sub>.

### HAZARDOUS POLYMERIZATION:

Will not occur.

## 11. Toxicological Information

**EYE:** Eye irritation was reported in 6 human volunteers exposed to 94 mg/m<sup>3</sup> (134 ppm) ammonia for 5 minutes. At 700 ppm eye irritation and permanent injury may result if prompt remedial measures are not taken. (Chris. Hazard Chem Data, Vol. II 1984-85).

**SKIN:** Concentrations of 5 to 10% ammonia rarely causes burns to the skin.

**ORAL:** Deliberate suicidal ingestion of 5-10% ammonia (household ammonia) has resulted in esophageal burns.

**INHALATION:** Irregular minute ventilation with cyclic patterns of hypernea, increases in blood pressure and pulse rate, variable lacrimation, and general complaints of upper respiratory irritation were reported during human exposures to 500 ppm ammonia for 30 minutes.

**CHRONIC:** Guinea pigs (12) exposed to 170 ppm ammonia 6H/day, 5 D/Week for up to 18 weeks exhibited congestion of the spleen, liver, and kidneys with degenerative changes in suprarenal glands. No adverse effects were observed in the 4 exposed animals and 2 control animals killed at 6 and 12 weeks.

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## 12. Ecological Information

No Data

## 13. Disposal Considerations

Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container PROPERLY LABELED, WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE to BOC Gases or authorized distributor for proper disposal.

## 14. Transport Information

PARAMETER	United States DOT	Canada TDG
PROPER SHIPPING NAME:	Compressed gas, n.o.s. (Contains nitrogen and ammonia)	Compressed gas, n.o.s.
HAZARD CLASS:	2.2	2.2
IDENTIFICATION NUMBER:	1956	1956
SHIPPING LABEL:	Non-flammable gas	Non-flammable gas

## 15. Regulatory Information

Ammonia is listed under the accident prevention provisions of section 112(r) of the Clean Air Act (CAA) with a threshold quantity (TQ) of 10,000 pounds.

### SARA TITLE III NOTIFICATIONS AND INFORMATION

Releases of ammonia in quantities equal to or greater than the reportable quantity (RQ) of 100 pounds are subject to reporting to the National Response Center under CERCLA, Section 304 SARA Title III.

### SARA TITLE III - HAZARD CLASSES:

Acute Health Hazard

Sudden Release of Pressure Hazard

### SARA TITLE III - SECTION 313 SUPPLIER NOTIFICATION:

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

CAS NUMBER	INGREDIENT NAME	PERCENT BY VOLUME
7664-41-7	Ammonia	0-5

This information must be included on all MSDSs that are copied and distributed for this material.

**EPCRA SECTION 302:** This product contains ammonia, a designated Extremely Hazardous Substance (EHS) with a Threshold Planning Quantity (TPQ) of 500 pounds. The presence of EHSs in quantities in excess of the TPQ requires certain emergency planning activities to be conducted.

## 16. Other Information

ACGIH	American Conference of Governmental Industrial Hygienists
DOT	Department of Transportation
IARC	International Agency for Research on Cancer
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
SARA	Superfund Amendments and Reauthorization Act
STEL	Short Term Exposure Limit
TDG	Transportation of Dangerous Goods
TLV	Threshold Limit Value
WHMIS	Workplace Hazardous Materials Information System

Compressed gas cylinders shall not be refilled without the express written permission of the owner. Shipment of a compressed gas cylinder which has not been filled by the owner or with his/her (written) consent is a violation of transportation regulations.

### **DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES:**

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