BOC GASES

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

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

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

TELEPHONE NUMBER: (905) 501-1700
24-HOUR EMERGENCY TELEPHONE NUMBER:
(905) 501-0802
EMERGENCY RESPONSE PLAN NO: 20101

PRODUCT NAME: AMMONIA (0-5%) IN NITROGEN
CHEMICAL NAME: Gas Mixture
COMMON NAMES/SYNONYMS: None
TDG (Canada) CLASSIFICATION: A, D1A, D2B
WHMIS CLASSIFICATION: 2.2

PREPARED BY: Loss Control (908)464-8100/(905)501-1700
PREPARATION DATE: 6/1/95
REVIEW DATES: 6/21/96

2. Composition, Information on Ingredients

INGREDIENT	% VOLUME	PEL-OSHA[1]	TLV-ACGIH[2]	LD_{50} or LC_{50} Route/Species
Nitrogen FORMULA: N_2 CAS: 7727-37-0 RTECS #: QW9700000	95-100	Not Available	Not Available	Simple asphyxiant
Ammonia FORMULA: NH_3 CAS: 7664-41-7 RTECS #: BO0875000	0-5	Not Available	25 ppm 35 ppm (STEL)	LC50: 2000 ppm /4H Inhalation/rat

[1] As stated in 29 CFR 1910, Subpart Z (revised July 1, 1993)

[2] As stated in the ACGIH 1994-95 Threshold Limit Values for Chemical Substances and Physical Agents

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. Exposure to ammonia present in this product may cause eye, skin, and respiratory irritation and or eye damage. High exposure may result in ammonia toxicity. Use only with adequate ventilation. Contents under pressure. Avoid heat and flames. Protect containers from physical damage.

ROUTE OF ENTRY:

Skin Contact	Skin Absorption	Eye Contact	Inhalation	Ingestion
Yes	No	Yes	Yes	No

HEALTH EFFECTS:

Exposure Limits	Irritant	Sensitization
Yes	Yes	No
Teratogen	Reproductive Hazard	Mutagen
No	No	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. Ammonia can cause eye damage with corneal burns if not rinsed promptly.

SKIN EFFECTS:
Contact may cause skin irritation and redness.

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

INHALATION EFFECTS:
Release of sufficient quantities of this product may cause asphyxiation or suffocation by displacing oxygen content in the air. High concentrations of ammonia vapors can cause laryngitis, pulmonary edema or pneumonitis.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: May aggravate pre-existing corneal disease, glaucoma, and respiratory disease.

NFPA HAZARD CODES	HMIS HAZARD CODES	RATINGS SYSTEM
Health: 2	Health: 2	0 = No Hazard
Flammability: 0	Flammability: 0	1 = Slight Hazard
Reactivity: 0	Reactivity: 0	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.

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. 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_3 and NO_x		
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). Containers may explode when exposed to heat or flames.

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. Firefighters should wear a full-facepiece, NIOSH/MSHA-approved self-contained breathing apparatus (SCBA) operated in positive pressure mode and full turnout gear.

6. Accidental Release Measures

Evacuate all personnel from affected area. 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.

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 (<3000 psig) 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 130^{o}F (54^{o}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 and G-2.

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

EXPOSURE LIMITS[1]:

INGREDIENT	% VOLUME	PEL-OSHA[2]	TLV-ACGIH[3]	LD_{50} or LC_{50} Route/Species
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Ammonia FORMULA: NH_3 CAS: 7664-41-7 RTECS #: BO0875000	0-5	Not Available	25 ppm 35 ppm (STEL)	LC50: 2000 ppm /4H inhalation/rat

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

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.

OTHER/GENERAL PROTECTION:
Safety shoes, emergency eyewash station.

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	^{o}C (liquid, as N_2)
Freezing point:	: Not Available	
pH	: Not Available	
Specific gravity at STP	: Not Available	
Oil/water partition coefficient	: Not Available	
Solubility (H20)	: Negligible	
Odor threshold	: 4.68 ppm	(Pure NH_3 in air)
Odor and appearance	: Colorless gas with ammonia odor	

10. Stability and Reactivity

STABILITY:
Stable

INCOMPATIBLE MATERIALS:
Ammonia is corrosive to copper and galvanized surfaces. Ammonia is incompatible with strong oxidizers, acids, halogens, and salts of silver and zinc.

HAZARDOUS DECOMPOSITION PRODUCTS:
Thermal decomposition will produce toxic fumes of NH_3 and No_x.

HAZARDOUS POLYMERIZATION:
Will not occur.

11. Toxicological Information

EYE: Eye irritation was reported in 6 human volunteers exposed to 94 mg/m^3 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.

12. Ecological Information

ATMOSPHERIC FATE: Ammonia combines with sulfate ion in the atmosphere or in washout by rainfall resulting in a rapid return of ammonia to the soil.

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. (Contains nitrogen and ammonia)
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

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:
Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).